IRVINE RANCH WATER DISTRICT

2015 Urban Water Management Plan

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Final

Irvine Ranch Water District, 15600 Sand Canyon Ave., Irvine, California 92618

IRVINE RANCH WATER DISTRICT

2015 Urban Water Management Plan Contact Sheet

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1. INTRODUCTION AND OVERVIEW

1.1. Urban Water Management Planning Act

This Urban Water Management Plan (UWMP, Plan) of the Irvine Ranch Water District has been prepared in response to the Urban Water Management Planning Act (Water Code), Water Code Sections 10610 through 10656, which were added by Statute 1983, Chapter 1009, and became effective on January 1, 1984, including any and all changes to the California Water Code since the adoption of the 2010 UWMP. The Act requires that "every urban water supplier 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 to prepare and adopt an urban water management plan."

The Urban Water Management Planning Act requires that IRWD file an update to its 2010 UWMP. IRWD's 2015 UWMP was prepared in accordance with the requirement that urban water purveyors submit a plan to the Department of Water Resources (DWR), addressing water supply and demands, conservation measures, and water recycling among other things. IRWD prepared previous plans in 1985, 1990, 1995, 2000, 2005 and 2010. Several legislative amendments have been made to the Act since the last submission in 2010 and this UWMP update incorporates all of the new requirements.

IRWD prepared the 2015 update in coordination with the other agencies as indicated. IRWD utilized the DWR "Guidebook to Assist Urban Water Suppliers to Prepare a 2015 Urban Water Management Plan" in the preparation of its UWMP.

1.2. Irvine Ranch Water District Background

Irvine Ranch Water District (IRWD, District) is a multi-service agency responsible for providing domestic water service, sewage collection and treatment, water recycling, and urban runoff natural treatment in Central Orange County, California. IRWD provides water service to approximately 380,000 residents. IRWD encompasses approximately 181-square miles extending from the Pacific Coast to the foothills of the Santa Ana Mountains, covering elevations ranging from sea level to 1,700 feet. IRWD services the City of Irvine and portions of Costa Mesa, Lake Forest, Newport Beach, Orange, Tustin, Santa Ana and unincorporated areas of Orange County.

Established in 1961 as an independent special district organized under the California Water District Code, IRWD is governed by a five-member, publicly elected Board of Directors responsible for the District's policies and decision making. Day-to-day operations are supervised by the General Manager and District staff.

IRWD's mission is to provide high quality water and sewer services in an efficient, cost effective, and environmentally sensitive manner which produces a high level of customer satisfaction.

1.3. Water Resources Planning

In 1972, IRWD developed a master plan for the domestic (potable) and irrigation (non-potable) water systems. As IRWD's service area developed, the original master plans were updated over the years, and in 1991, IRWD combined the potable and non-potable master plans to make up the Water Resources Master Plan (WRMP) to evaluate District-wide resources in their entirety. The WRMP, IRWD's principal planning document, is a comprehensive document compiling data and analysis that IRWD considers necessary for its planning needs. The WRMP provides the framework for future IRWD water resource planning and decision making from supply/demand, operations and financial perspectives.

Another objective of the WRMP is to assist IRWD in compliance with enacted legislation (SB221 and SB610), which requires water retailers to demonstrate whether their water supplies are sufficient for certain proposed subdivisions and large development projects subject to the California Environmental Quality Act (CEQA). Due to significant land use changes with IRWD's area over the years, it was important that IRWD ensure its existing and planned supplies were sufficient to meet revised demands. The WRMP assists IRWD in compliance with the Water Conservation Act of 2009 and also takes into account the goals and objectives of the UWMP.

See Chapters 3, 4, 6, 7 and 8 of this UWMP for the detailed information on IRWD's service area, water systems, supplies and demands, and water supply reliability in accordance with the Urban Water Planning Act.

2. PLAN PREPARATION

2.1. Basis for Preparing a Plan

Law

> 10617 "Urban water supplier" means a water supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 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.
>
> 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).

In accordance with the Water Code, IRWD is an urban water supplier with 3,000 or more service connections and is required to prepare an UWMP every five years. The Urban Water Management Planning Act requires that IRWD file an update to its 2010 UWMP. IRWD's 2015 UWMP was prepared in accordance with the requirement that urban water purveyors submit a plan to the Department of Water Resources, addressing water supply and demands, conservation measures, and water recycling among other things. Several legislative amendments have been made to the Act since the last submission of 2010 and this UWMP update incorporates all of the new requirements.

2.2. Public Water Systems

IRWD is considered an urban water supplier for purposes of submitting an UWMP. IRWD includes only one public water system regulated by the State Water Resources Control Board, Division of Drinking Water. DWR Table 2-1 below provides DWR's required information regarding public water systems with respect to IRWD.

DWR Table 2-1: Public Water Systems

Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
3010092	Irvine Ranch Water District	111,511	90,403
	TOTAL	111,511	90,403

2.3. Regional Planning and Regional Alliance

IRWD is the largest member agency of the Municipal Water District of Orange County (MWDOC) in terms of service area and overall water use. MWDOC is a wholesale importer of water from the Metropolitan Water District of Southern California (MWD). MWDOC serves all of Orange County except for the cities of Anaheim, Fullerton and Santa Ana. IRWD coordinated the update of this plan in participation with MWDOC. References are made in a more general aspect to the regional Urban Water Management Plans prepared by both the MWD and MWDOC.

IRWD, as an urban water supplier, developed its 2015 UWMP that reports solely on its own service area. This individual UWMP addresses all requirements of the California Water Code. IRWD has notified and coordinated with MWDOC on the preparation of this UWMP. IRWD's Board of Directors, its governing body, must adopt IRWD's UWMP.

As discussed further in Chapter 5, Baselines and Targets, as a retail agency IRWD has the option of complying individually or participating in a Regional Alliance. IRWD chose to participate in a Regional Alliance with the MWDOC. The Regional Alliance calculation is based on the first option allowed, and provides maximum flexibility. Each individual agency calculated its own individual target, as if it were complying individually. IRWD calculated and reported on its baseline per capita water use, 2020 water use target and interim target in order to comply with the Water Conservation Act of 2009 as part of its individual UWMP. DWR Table 2-2 contains IRWD's required information related to Plan Identification.

DWR Table 2-2: Plan Identification

Select Only One	Type of Plan		Name of RUWMP or Regional Alliance *if applicable* *drop down list*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☑	Water Supplier is also a member of a Regional Alliance	Orange County 20x2020 Regional Alliance

2.4. Standardized Tables, Year and Units of Measure Used

Law

10644(a)(2) The plan, or amendments to the plan, submitted to the department…shall include standardized forms, tables or displays specified by the department.

IRWD prepared the 2015 update to the UWMP in coordination with other agencies as indicated. IRWD utilized the standardized forms provided by DWR in its 2015 update to the UWMP. The Act provides for water suppliers to report on a fiscal year or calendar year basis. In the 2015 update to the UWMP, IRWD has reported its data on a fiscal year basis with each fiscal year starting July 1. For example, for reporting water use and supply data for 2015, IRWD uses its

fiscal year 2014-2015. DWR Table 2-3 includes the DWR required information related to agency identification, type of agency, type of reporting year, and the units of measure.

DWR Table 2-3: Agency Identification

Type of Agency (select one or both)	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year (select one)	
☐	UWMP Tables Are in Calendar Years
☑	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
7/1	
Units of Measure Used in UWMP (select from Drop down)	
Unit	AF

2.5. Coordination with Wholesale Agencies

Law

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 projects 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 whole agency to the urban water supply 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.

As stated, IRWD is the largest retail member agency of the MWDOC in terms of service area and overall water use. MWDOC is a wholesale importer of water from MWD. MWDOC serves all of Orange County except for the cities of Anaheim, Fullerton and Santa Ana. IRWD coordinated the update of this plan with MWDOC. References are made in a more general aspect to the Regional UWMPs prepared by both MWD and MWDOC. DWR Table 2-4 identifies IRWD's wholesale water supplier.

DWR Table 2-4: 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 *(Add additional rows as needed)*
Municipal Water District of Orange County

2.6. Coordination with Other Agencies and the Community

Law

10620(d)(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

10621(b) Every urban water supplier required to prepare a plan pursuant to the 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.

10642 Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.

IRWD serves all or portions of seven cities, plus part of unincorporated Orange County. Land use within IRWD's service area has been changing steadily from an agricultural community to an urban development area. IRWD must coordinate closely with various cities within its service area on the respective cities' general planning to determine IRWD's full buildout demands especially for the current undeveloped areas. Land use and demographic changes that have affected IRWD's water supply and system planning are described more fully in Chapter 3.

On December 23, 2015, IRWD notified all seven of the cities within IRWD's service area and the County of Orange that IRWD would be reviewing the UWMP and considering amendments or changes to the plan for the 2015 update. The notification provided the opportunity for the cities and County and Orange to submit comments regarding IRWD's UWMP during the update process. IRWD did not receive any comments from the cities or the County during the preparation of its UWMP 2015 update. IRWD's specific notifications to the cities and the County of Orange within IRWD's service area of IRWD's UWMP preparation and coordination are included in Appendix C.

3. SYSTEM DESCRIPTION

Law

10631(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The 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.

3.1. General Description, Service Area Boundary

Irvine Ranch Water District, a California Water District, was formed in 1961 and is located in the south central portion of Orange County (see Figure 1). IRWD provides potable and non-potable water supply, wastewater collection, treatment and disposal, and wastewater recycling. IRWD overlies much of the old Irvine Ranch property and includes all of the City of Irvine and portions of the surrounding jurisdictional agencies such as the cities of Tustin, Santa Ana, Orange, Costa Mesa, Lake Forest, Newport Beach, and unincorporated areas of the County of Orange. Currently, IRWD encompasses a 181-square mile service area with an estimated population of 381,470.

Figure 1: IRWD service within Orange County

Figure 2: IRWD Service Area

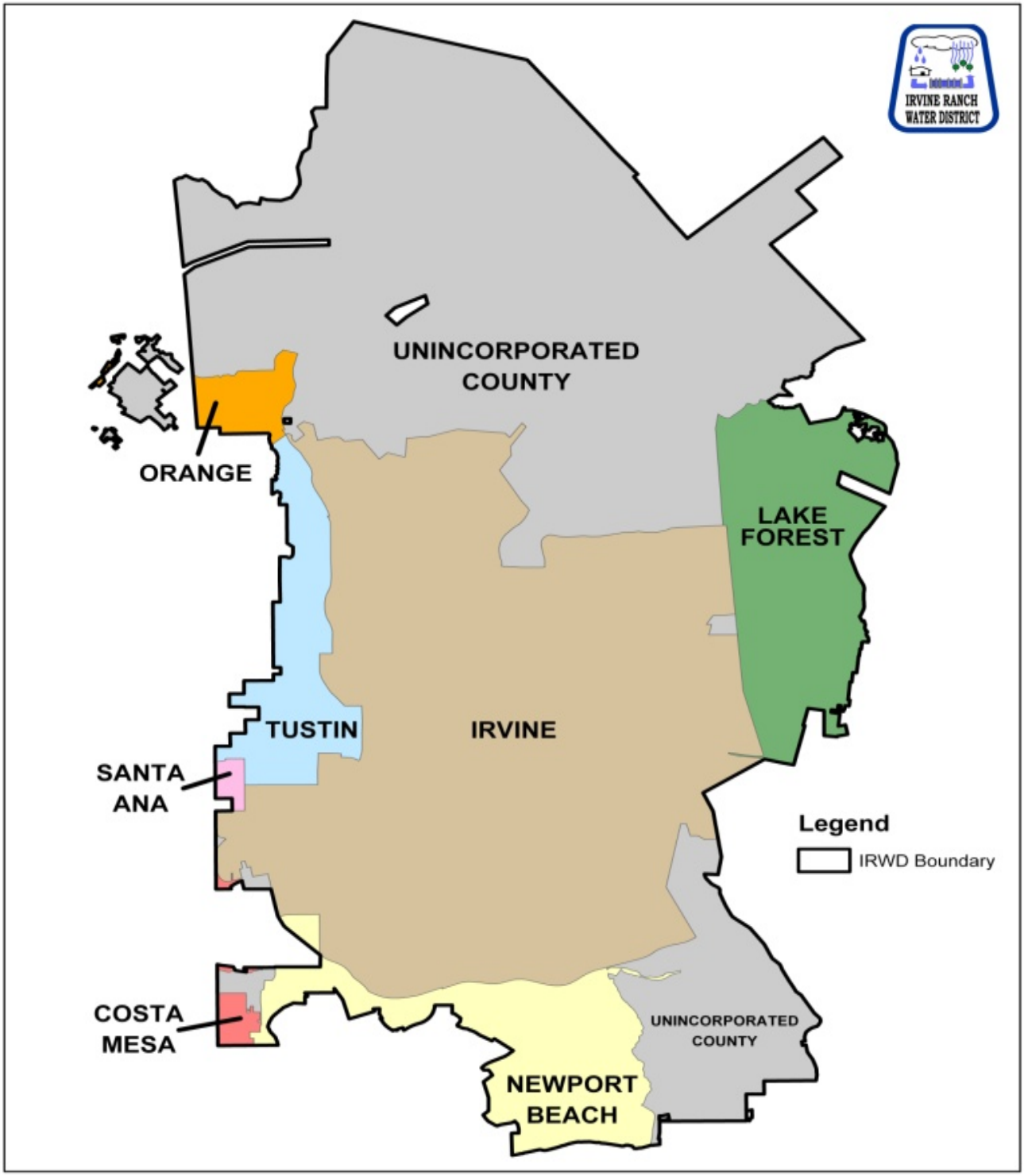

Figure 2 above depicts IRWD's service area boundary. In 1997, IRWD acquired neighboring Santa Ana Heights Mutual Water Company with approximately 2,800 connections. In 2001, IRWD merged on the east boundary with the Los Alisos Water District with approximately 12,400 connections. In 2006, IRWD merged with Santiago Water District, located within the

unincorporated area of Orange County, with 740 connections. In 2008, IRWD merged with Orange Park Acres Mutual Water Company, located within the City of Orange, with 530 connections. IRWD's current records show 111,511 connections serve 90,403 acre-feet (AF) of water annually.

IRWD is an independent special district organized under the California Water District Code, IRWD is governed by a five-member, publicly elected Board of Directors responsible for the District's policies and decision making. Day-to-day operations are supervised by the General Manager and District staff.

IRWD's mission is to provide high quality water and sewer services in an efficient, cost effective, and environmentally sensitive manner which produces a high level of customer satisfaction.

3.2. Climate

IRWD's service area has a generally mild and relatively uniform climate with an average rainfall in the area of 14.2 inches. The table below (IRWD Table 1) below shows average climate characteristics for the IRWD service area.

IRWD Table 1: IRWD Average Climate

IRWD Average Climate						
	Jan.	*Feb*	*March*	*April*	*May*	*June*
Monthly Average ETo	2.12	2.26	3.42	4.65	4.98	5.59
Average Rainfall	2.997	4.3	2.36	1.08	0.47	0.1
Average Temperature	56.1	56.9	57.8	59.0	65.8	65.5
	July	*Aug*	*Sept*	*Oct*	*Nov*	*Dec*
Monthly Average ETo	6.03	6.06	4.55	3.49	2.43	2.13
Average Rainfall	0.0	0.005	0.22	0.27	1.39	1.66
Average Temperature	69.9	68.9	71.2	62.0	56.7	56.2

ET and Rainfall are reported in inches; Temperature is degrees in Fahrenheit.

3.3. Population

IRWD serves all or portions of seven cities, plus part of unincorporated Orange County. IRWD, once largely an agricultural community, is continuing to undergo municipal and industrial development with vacant land and farmland being urbanized each year. IRWD's service area population of 381,463 (June 2015) is approximately 80% of the ultimate projected population estimated at 479,783 for 2035. In addition, IRWD's estimated daytime population is approximately 530,000 persons.

Population data shown in DWR Table 3-1 below was developed based on information from the Center for Demographic Research at California State University, Fullerton (CDR) and 2015. The CDR approach has been approved by DWR for use by the Municipal Water District of Orange County in its Regional UWMP, which includes IRWD. IRWD is using the same CDR data and approach in its individual plan. CDR developed projections for non-census years using California State Department of Finance Data combined with GIS information.

DWR Table 3-1: Population – Current and Projected

Population Served	2015	2020	2025	2030	2035
	381,463	440,981	467,483	475,346	479,783

3.4. Other Demographic Factors

Other demographic factors that have affected IRWD's water management and supply planning over the development of its service area are described below.

Much of the original agricultural lands within IRWD's service area have been converted to residential, commercial, industrial and other urban uses. The majority of the development within the IRWD service area follows the City of Irvine General Plan first adopted in 1973 and amended several times since then. The remainder of the service area follows the appropriate jurisdictional agency's General Plan or projections from the County of Orange. These plans establish a guideline for land use development within the IRWD service area and serve to coordinate the timing of future growth.

The model used to forecast IRWD water demands calculates existing and future population estimates by multiplying the number of dwelling units in each density category by the number of persons per dwelling unit for that category (see "IRWD's Water Resource and System Planning" below). A major characteristic of IRWD's service area is the concept of residential villages with a wide range of housing products and densities and very low-density residential development in the rugged, more environmentally sensitive foothills.

Industrial and Commercial Activities

Industrial and commercial development within IRWD has been concurrent with residential development. The jurisdictional agencies' General Plans define industrial and commercial development within the IRWD service area. These developments consist of regional commercial centers with high-rise buildings, major business and industrial complexes located along the eastern and western edges of IRWD's service area.

Institutional

The University of California, Irvine (UCI) main campus occupies 1,489 acres within the south-central part of IRWD. The present student population is about 31,500 with approximately 10,500 faculty and staff. There is a projected UCI build-out population of approximately 36,000

students and 6,000 faculty and staff at the year 2025. IRWD participates with UCI on its Subarea Master Planning to determine the effects of planned improvements on IRWD's water, recycled water and sewer systems.

Major Land Use Changes

In 1999, the Marine Corps stations located at the eastern (El Toro) and western (Tustin) portion of IRWD closed as part of the Federal Base Realignment and Closure process. Redevelopment and reuse plans for both bases have been prepared by the various jurisdictional agencies and IRWD has been involved and prepared various levels of planning studies for these plans. For the Tustin base property, IRWD relies on the current land use plans prepared by the City of Tustin. The El Toro base property, formerly within the unincorporated County of Orange, was mostly annexed to the City of Irvine and IRWD has included project water demands based on the City's and County's proposed land use plan for the base property.

IRWD's Lake Forest service area (formerly Los Alisos Water District) is zoned for approximately 2/3 residential and 1/3 commercial development. Existing development is primarily single-family residential with some multi-family residential, office space, commercial industrial and open space. The industrial and commercial development provide a wide range of services such as manufacturing, assembly, research and development, high technology, aerospace, professional services, biomedical and warehouse operations among others. Currently, the City of Lake Forest is in various stages of developing approximately 950 acres (commercial and residential) of previous vacant land adjacent to the former Marine Corps Air Station at El Toro. IRWD works closely with the City of Lake Forest on its ultimate plan for this area and has updated its water demand projections accordingly.

In late 2001, the Irvine Company (the major land owner within IRWD's service area) announced the planned dedication of a large area as permanent open space. The majority of this land is located in the northwestern portion of IRWD's service area (City of Orange sphere of influence), with an additional area near Laguna Canyon Road. Based on this change, IRWD has made appropriate reductions in its demand projections.

IRWD's Water Resource and System Planning

The basis for the preparation of the UWMP is IRWD's principal water management planning document, the WRMP. IRWD's WRMP describes both the potable and non-potable systems and provides a basis for future IRWD water resource planning. The WRMP is a comprehensive document compiling data and analysis, including current and future land uses, that IRWD considers necessary for its planning needs. The WRMP provides identification of an optimum mix of water resources to meet normal and emergency requirements which prioritizes local supplies verses imported supplies.

The foundation for IRWD's water resource planning is the compilation of land use data. For IRWD, this has required interfacing with multiple jurisdictions and developing a land use database using a geographic information system (GIS). Computerized GIS linked to the master planning process enables more detailed categorization of residential land use to better match residential land use by jurisdictional agency.

Included in the WRMP, IRWD employs water use factors to enable it to assign water demands to various land use types and aggregate the demands. The water use factors are based on average water use and incorporate the effect of IRWD's tiered-rate conservation pricing and its other water conservation programs. The factors are derived from historical usage (billing data) and a detailed review of water use factors within the IRWD services areas conducted as part of the WRMP. Land use data is used in conjunction with updated water use factors to estimate water requirements through development of a "demand forecasting tool." Appropriate GIS layers are established to segregate demands for system and storage evaluations. These evaluations are based on system criteria, which are reviewed in detail and updated as part of the planning effort.

IRWD's water resources reliability program relies on diversifying water supplies and further maximizing local resources to meet demands. These efforts including maximizing local groundwater development, expansion of IRWD's recycling water program, and the development of water banking facilities in the Kern County area to provide a contingency, supplemental supply for extended drought or supply interruptions when imported supplies may be restricted.

As discussed more in Chapter 6, IRWD's potable water system was historically reliant on imported water supplies from MWD; however, in an effort to develop local supply reliability, in 1979, IRWD constructed its primary groundwater supply the Dyer Road Well Field. To further offset the need for imported water for non-potable uses, IRWD has also continued to expand its recycled water program as demands have increased.

4. SYSTEM WATER USE

Law

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

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), 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; and (I) Agricultural, (J) Distribution system water loss.

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

As described in Chapter 3, the foundation for IRWD's water demand forecasting and planning in its WRMP is the compilation of land use data. Land use data obtained through the multiple jurisdictions (cities and County) within IRWD's service area is used in conjunction with IRWD's applied water use factors to estimate water requirements. IRWD employs water use factors which assign water demands to various land use types and aggregates the demands. The water use factors are based on average water use and incorporate the effect of IRWD's tiered-rate conservation pricing. The factors are derived from historical usage and a detailed review of water use factors within the IRWD service area conducted as part of IRWD's planning.

4.1 Demand Sectors in Water Code

All connections for IRWD are metered. Each single-family dwelling unit and many townhouses and condominiums have individual meters. IRWD employs the following DWR-defined demand sectors: Single family residential, multi-family, commercial, industrial, institutional/ governmental, landscape, sales to other agencies (recycled water only), agricultural, distribution system losses. Other water demands that IRWD incorporates in water uses includes metered water used for temporary construction, fire line and lake filling and any unbilled authorized consumption such as water used for line flushing or well start up. The "Other" category does not include any water losses which are reported separately as "Losses".

Current and projected data on water use within IRWD's service in five-year increments is provided in DWR Tables 4-1, 4-2 and 4-3 below. Current information is based on monthly records of water sales throughout the service area. The majority of irrigation use within IRWD is served with recycled water; the current and projected demand for recycled water only is

included in DWR Table 6-4. IRWD's recycled water demand combined with potable and raw water demands for current and projection is shown in DWR Table 4-3. DWR Tables 4-1, 4-2 and 4-3 include IRWD's distribution system water loss, and potable or raw water landscape and agricultural uses.

Water use in 2015 as shown in DWR Table 4-1 is lower than anticipated due to the historically dry conditions throughout the state of California and the Governor's Executive Order issued on April 1, 2015, which mandated an aggregate statewide 25 percent reduction in potable water use through February 2016.

DWR Table 4-1: Demands for Potable and Raw Water – Actual

Use Type *(Add additional rows as needed)*	2015 Actual		
Drop down list *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool*	Additional Description *(as needed)*	Level of Treatment When Delivered *Drop down list*	Volume
Multi-Family		Drinking Water	6,286
Single Family		Drinking Water	24,024
Commercial		Drinking Water	7,856
Landscape		Drinking Water	4,987
Institutional/Governmental		Drinking Water	2,418
Agricultural irrigation		Drinking Water	226
Industrial		Drinking Water	5,836
Other		Drinking Water	808
Landscape		Raw Water	605
Agricultural irrigation		Raw Water	1,819
Agricultural irrigation	Supplement to RW System	Raw Water	649
Landscape	Supplement to RW System	Raw Water	4,339
Commercial	Supplement to RW System	Raw Water	49
Industrial	Supplement to RW System	Raw Water	10
Other	Supplement to RW System	Raw Water	153
Losses	Distribution System Water Loss	Drinking Water	4,091
		TOTAL	64,154

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

Use Type *(Add additional rows as needed)* Drop down list *May select each use multiple times* *These are the only Use Types that will be recognized by the WUEdata online submittal tool*	Additional Description *(as needed)*	Projected Water Use *Report To the Extent that Records are Available*				
		2020	2025	2030	2035	2040-opt
Agricultural irrigation		1,209	1,055	881	707	
Commercial		9,865	10,653	11,138	11,623	
Industrial		6,890	7,136	6,118	6,118	
Institutional/Governmental		2,274	3,932	6,474	6,478	
Landscape		4,355	3,689	3,087	2,484	
Multi-Family		12,428	14,182	14,726	15,274	
Single Family		29,532	32,098	33,078	34,055	
Losses	Distribution Syst Water Loss	4,533	4,955	5,143	5,227	
TOTAL		71,086	77,700	80,645	81,966	0

DWR Table 4-3: Total Water Demands

	2015	2020	2025	2030	2035	2040 *(opt)*
Potable and Raw Water *From Tables 4-1 and 4-2*	64,154	71,086	77,700	80,645	81,966	0
Recycled Water Demand* *From Table 6-4*	26,249	25,359	28,261	28,786	29,311	0
TOTAL WATER DEMAND	90,403	96,445	105,961	109,431	111,277	0
**Recycled water demand fields will be blank until Table 6-4 is complete.*						

4.2 Distribution System Water Losses

Projected water losses, reported in five year increments, are included in IRWD's UWMP to the extent that records are available. IRWD quantified its distribution system losses using the American Water Works Association Method and Audit Software. Appendix D contains IRWD's Reporting Worksheet and Performance Indicators. IRWD's system scored a 1.19 in the Infrastructure Leakage Index (ILI). The ILI is a highly effective performance indicator for benchmarking utilities in operational management of real losses. Although not required, IRWD contracted with a third party consultant which validated IRWD's water loss audit findings.

DWR Table 4-4 below includes IRWD's water losses for the 12-month period July 1, 2014 through June 30, 2015. This water loss volume is also reported in DWR Table 4-1 above and is projected through the 20-year reporting period in DWR Table 4-2 also above.

DWR Table 4-4: 12 Month Water Loss Audit Reporting

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
07/2014	4091
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	

4.3 Estimating Future Water Savings

IRWD's water use projections do not account for future water savings estimated from "passive savings" from codes, standards, or ordinances. It does incorporate water savings experienced through IRWD's budget based tiered rate structure.

4.4 Water Use of Lower Income Households

In accordance with Water Code Section 10631.1(a), IRWD's water use projections 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.

5. SBX7-7 BASELINES AND TARGETS

5.1 Update of Target Method

Law

10608.20(b) Retail suppliers shall adopt a 2020 water use target using one of four methods.

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).

With the adoption of the Water Conservation Act of 2009, also known as SB X7-7, the State is required to reduce urban water use by 20 percent by 2020. In the 2010 UWMP's urban water agencies were required to calculate baseline water use and target water use for the years 2015 and 2020 following DWR's *Methodologies for Calculating Baseline and Compliance Per Capita Water Use*. Agencies may calculate their targets using one of four different methods. In their 2015 UWMP's agencies must demonstrate compliance with their calculated targets, although the baselines and selected target calculation method may be revised.

To meet this requirement, as part of its 2010 UWMP, IRWD calculated and reported on its individual baseline per capita water use, 2020 water use target and 2015 interim target. IRWD used Method 1 to calculate its individual 2020 target which is defined as 80 percent of baseline gallons per capita per day (GPCD) use. IRWD has not modified its individual target methodology used in the 2010 submittal in this plan. IRWD developed its individual baseline and targets consistent with DWR's *Methodologies for Calculating Baseline and Compliance Per Capita Water Use*, and as described below.

5.2 Standard Tables for SBX7-7 Reporting

Law

10644 The plan… shall include any standardized forms, table or displays specified by the department.

IRWD has completed and submitted the required standardized tables in the SB X7-7 Verification Form. A copy of the SB X7-7 tables applicable to IRWD is provided in Appendix E.

5.3 Baseline Period

Law

> 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.
>
> 10608.12(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.
> (2) For an urban retail supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier..., the supplier may extend the calculation described n paragraph (1) up to an additional five years, to a maximum of a continuous 15-year period ending no earlier than December 31, 2004.
>
> 10608.12(b) For the purposes of Section 10608.22. the urban water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007.

To comply with Water Code Section 10608, agencies must calculate a 10 or 15-year baseline. Agencies are only eligible to use a 15-year baseline if recycled water use in 2008 met at least 10 percent of its measured retail. IRWD delivered 14,358 AF of recycled water from total deliveries of 97,216 AF in 2008, or 14.7% of total deliveries, and therefore is eligible for an extended 15-year baseline. Fifteen year baselines must be continuous, ending no earlier than December 31, 2004 and no later than December 31, 2010. IRWD's 15-year baseline period is from fiscal year 1990-91 through fiscal year 2004-2005. Over the 15-year baseline period, IRWD's average water use was 214 GPCD. IRWD has not modified its 15-year baseline per capita use from its 2010 UWMP submittal (Water Code Section 10608.24(d)(2)).

IRWD has updated its 5-year baseline period from in this 2015 plan. In the 2010 plan the baseline was from 2003 to 2007. IRWD reports on a fiscal year basis, and therefore to ensure the 5-year period ends no earlier than December 31, 2007, IRWD has revised its 5-year baseline to the 2004-2008 period.

Information on the 15-year and 5-year baseline periods is provided below in SB X7-7 Table 1.

SB X7-7 Table 1: Baseline Period Ranges

Baseline	Parameter	Value	Units
10- to 15-year baseline period	2008 total water deliveries	97,216	Acre Feet
	2008 total volume of delivered recycled water	14,358	Acre Feet
	2008 recycled water as a percent of total deliveries	14.77%	Percent
	Number of years in baseline period[1, 2]	15	Years
	Year beginning baseline period range	1991	
	Year ending baseline period range[3]	2005	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2004	
	Year ending baseline period range[4]	2008	

5.4 Use of 2010 Census Data and Service Area Population

Law

10608.20(e) When calculating per capita values for the purpose of this chapter, an urban retail water supplier shall determine population using federal, state and local population reports and projections

In order to correctly calculate GPCD, agencies must determine the population that they year for each of the baseline year in both of the baseline periods and for the 2015 compliance year. IRWD serves all or portions of seven cities, plus part of unincorporated Orange County. Population data was developed for by the Center for Demographic Research at California State University, Fullerton (CDR) in 2010 and 2015. The CDR approach has been approved by DWR for use by MWDOC and all of the agencies in its Regional UWMP, which includes IRWD. IRWD is using the same CDR data and approach in determining its individual targets. Population estimates were derived from the 2000 census data in the 2010 UWMP. The population information has been updated in this plan with 2010 census data. CDR developed projections for non-census years using California State Department of Finance Data combined with GIS information. There are no changes to the original population data for the baseline periods. The population data for IRWD is based on IRWD's 2015 service area boundary. IRWD has consolidated with several other agencies since during and since the baseline period. The water supply and population data for all of those areas was included for the entire baseline period for purposes of consistency.

5.5 Gross Water Use Calculation

Law

> 10608.12 Gross Water Use means the total volume of water, whether treated or untreated, entering the distribution system of an urban water supplier, excluding all of the following: (1) Recycled water that is delivered within the service area (2) The net volume of water the urban retail water supplier places into long term storage (3) The volume of water the 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.

Gross water use is a measure of the water that enters the distribution system of the supplier over a 12-month period. All of IRWD's water use data is reported on a fiscal year basis (July 1 – June 30). IRWD consolidated with several other agencies during the baseline period, and therefore the combined water use data for the whole consolidated service area was used for the entire baseline period for purposes of consistency. A schematic of IRWD's distribution system is provided in Appendix F.

IRWD's potable sources of supply include imported treated water and local groundwater. IRWD's non-potable water supplies consist of recycled water, untreated imported water, surface water and non-potable groundwater. To calculate gross water use, IRWD compiled water volumes from its various water sources based on metered water supplied to the distribution system in accordance with DWR's technical methodologies. Exports of non-recycled water from IRWD to other agencies were calculated based on metered data and deducted.

IRWD has insignificant changes in storage, and no water is transferred from within the distribution to long-term storage. Within the potable distribution system, operational storage is provided in each service zone to balance the differences between the rates of supply and the hourly demand on a given day. While there are changes in storage over the course of a day, annual changes in the operational storage in the potable distribution system are insignificant. Untreated water is used to supplement IRWD's recycled water system on an as needed basis; it does not require operational storage once it enters the distribution system. No adjustments were made for changes in long-term storage.

Adjustments to the gross water use for recycled water, agricultural use and indirect potable reuse are discussed below.

Recycled Water and Agricultural Use

In accordance with Section 10608.12 (m), recycled water directly entering the distribution system is deducted from the calculation of gross water, based on metered data. Since SB X7-7 applies to urban use, deliveries of other non-potable and potable water to agricultural customers are also deducted, based on metered billing data.

Indirect Potable Reuse

In addition to the deduction for direct recycled water, SBx7-7 allows urban retail water suppliers to calculate a deduction for recycled water indirectly entering their distribution system indirectly

through a groundwater source, referred to as indirect potable reuse (IPR). As a producer within the OCWD, IRWD may use this deduction to account for the recharge of recycled water into the basin by OCWD, historically through Water Factory 21, and more recently by the Ground Water Replenishment System (GWRS).

The allowable deduction depends on the amount of indirect potable reuse extracted as part of IRWD's potable groundwater production from its wells within the OCWD basin.
IRWD's uses DWR's Recharge Data Less In-Basin Losses methodology to calculate the allowable deduction for indirect potable reuse, which is based on the product of the following three factors.

1) Annual Volume of Water Recharged for IPR Use

Because there can be year-to-year variations in the amount of recycled water applied in a groundwater recharge operation, the calculation requires the use of long-term running averages. IRWD uses a five-year average of recycled water recharged by OCWD for IPR.

2) Loss Factor

A loss factor must be applied to account for water losses during recharge and extraction. In its Groundwater Management Plan, OCWD determined that the appropriate loss factor is 3.5%, which includes losses over county lines to the Los Angeles Basin.

3) Volume of Water Pumped

The amount of the volume of recycled water recharged into the OCWD basin for IPR as a percentage of the total OCWD production is calculated. IRWD's total groundwater pumped is multiplied by the percentage of basin IPR to determine the IRWD IPR adjustment credit.

IRWD's Indirect Potable Reuse

The following IRWD Table 2 provides the calculation of recharge of recycled water for IPR by IRWD. Following is a description of how the credit is calculated.

The total groundwater recharged by OCWD for each year from Water Factory 21, and in later years from the GWRS is shown in column (1). The previous five-year average of recharge is shown in column (2).

To account for the loss factor of 3.5% provided by OCWD, only 96.5% of the recycled water recharged for IPR is assumed to enter the distribution system. Losses in extraction by IRWD are accounted for since the water is metered as it enters the distribution system. Waste and agricultural use of groundwater are excluded from IRWD's groundwater production data.

After accounting for these losses, the estimated volume of indirect recycled water entering the distribution system for all the OCWD producers is calculated in column (4). The recycled water recharged for IPR is expressed as a percentage of the total volume of water extracted from the basin in that year in column (5).

To determine the recharged recycled water entering IRWD's distribution system for IPR, IRWD's total basin potable groundwater production (7) is multiplied by the percentage of recharged recycled water. The result, shown in column (8) is IRWD's IPR credit.

For example, IRWD pumped 34,118 AF of water from the OCWD Basin in Fiscal Year 2004/05, so 1.47% of that groundwater production would be from recycled water recharged into the basin. This equates to a deduction of 500 AF from IRWD's calculation of Gross Water Use for that year.

IRWD Table 2: Calculation of Annual Deductible Volume of Indirect Recycled Water Entering Distribution System

Recycled Water Recharge for Indirect Potable Reuse								
Fiscal Year Ending	(1) OCWD Total Groundwater Recharge with Recycled Water (Acre-Feet)	(2) 5-Year Average Recharge with Recycled Water (Acre-Feet)	(3) Loss Factor for Recharge & Recovery	(2) x (3) = (4) Volume of Recycled Water Recharge Entering Distribution System (Acre-Feet)	(5) Total OCWD Basin Production	(4)/(5) = (6) Percent of Total Basin Production from Recharged Recyled Water	(7) IRWD OCWD Groundwater Basin Potable Production	(6) x (7) = (8) IRWD IPR Credit
1990	6,498	6,498	96.5%	6,271	229,878	2.73%	N/A	N/A
1991	6,634	6,498	96.5%	6,271	235,532	2.66%	14,892	396
1992	6,843	6,566	96.5%	6,336	244,333	2.59%	18,478	479
1993	8,161	6,658	96.5%	6,425	243,629	2.64%	17,817	470
1994	5,042	7,034	96.5%	6,788	237,837	2.85%	17,270	493
1995	2,738	6,636	96.5%	6,403	276,096	2.32%	21,722	504
1996	4,282	5,884	96.5%	5,678	302,273	1.88%	19,610	368
1997	4,389	5,413	96.5%	5,224	310,217	1.68%	23,122	389
1998	2,496	4,922	96.5%	4,750	297,726	1.60%	22,343	356
1999	3,489	3,789	96.5%	3,657	322,476	1.13%	22,149	251
2000	5,774	3,479	96.5%	3,357	320,250	1.05%	22,888	240
2001	2,067	4,086	96.5%	3,943	323,129	1.22%	22,280	272
2002	4,143	3,643	96.5%	3,515	322,590	1.09%	27,569	300
2003	3,867	3,594	96.5%	3,468	274,927	1.26%	33,687	425
2004	1,784	3,868	96.5%	3,733	266,969	1.40%	32,414	453
2005	4,156	3,527	96.5%	3,404	232,199	1.47%	34,118	500
2006	4,086	3,203	96.5%	3,091	215,172	1.44%	27,680	398
2007	218	3,607	96.5%	3,481	284,706	1.22%	43,979	538
2008	17,792	2,822	96.5%	2,723	351,622	0.77%	45,303	351
2009	54,261	5,607	96.5%	5,411	310,586	1.74%	45,468	792
2010	65,950	16,103	96.5%	15,539	273,889	5.67%	45,057	2,556
2011	66,083	28,461	96.5%	27,465	248,659	11.05%	37,703	4,164
2012	71,678	40,861	96.5%	39,431	266,066	14.82%	43,340	6,423
2013	72,877	55,153	96.5%	53,223	298,175	17.85%	44,024	7,858
2014	66,167	66,170	96.5%	63,854	318,967	20.02%	49,607	9,931
2015	76,546	68,551	96.5%	66,152	296,292	22.33%	45,284	10,110

5.6 Baseline Daily Per Capita Use

Once the gross water use is calculated, the per capita use is calculated for each of the two baselines; the fifteen-year baseline and the five-year baseline. SB X7-7 Table 5 below shows IRWD's water use as 214 GPCD for the fifteen-year baseline and 204 GPCD for the five-year baseline.

SB X7-7 Table 5: Gallons per Capita Per Day (GPCD)

Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1991	204,798	49,509	216
Year 2	1992	210,357	45,651	194
Year 3	1993	215,469	46,941	194
Year 4	1994	219,040	49,674	202
Year 5	1995	222,058	51,185	206
Year 6	1996	225,982	56,172	222
Year 7	1997	231,284	62,905	243
Year 8	1998	237,055	54,933	207
Year 9	1999	242,816	62,235	229
Year 10	2000	250,574	67,593	241
Year 11	2001	256,610	65,288	227
Year 12	2002	266,937	66,517	222
Year 13	2003	275,710	61,376	199
Year 14	2004	282,869	67,695	214
Year 15	2005	293,616	63,638	193
10-15 Year Average Baseline GPCD				**214**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2004	282,869	67,711	214
Year 2	2005	293,616	63,651	194
Year 3	2006	302,909	65,397	193
Year 4	2007	310,777	75,481	217
Year 5	2008	320,764	73,526	205
5 Year Average Baseline GPCD				**204**

5.7 2015 and 2020 Targets

Law

10608.20(e). An urban retail water supplier shall include in its urban water management plan… urban water use target, interim urban water target…along with the bases for determining those estimates.
(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan…

10608.22 Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban 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.

Water Use Target Method

Of the four different methods to choose from to calculate its 2020 water use target IRWD selected target Method 1. Method 1 is calculated as 80% of the 15-year baseline which results in a 2020 target of 171 GPCD. This is the same method IRWD selected in its 2010 plan.

2020 Target Confirmation

A water agency's 2020 target cannot be higher than a 5 percent reduction from its five-year baseline GPCD. A 5 percent reduction from IRWD's five-year baseline of 204 GPCD is 194 GPCD. Using Method 1, IRWD's 2020 target is 171. Since this is lower than 194, the 171 calculated target is IRWD's confirmed target, shown in SB X7-7 Table 7-F below.

SB X7-7 Table 7-F

5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
204	194	171	**171**

[1]Maximum 2020 Target is 95% of the 5 Year Baseline GPCD [2]2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.

2015 Interim Water Use Target

Water agencies must also calculate a 2015 interim target in order to determine compliance in 2015. The interim water use target is the value halfway between the 15-year baseline and the confirmed 2020 target. IRWD's 2015 interim water use target, calculated in SB X7-7 Table 8, and shown below, is 192 gallons per capita per day.

SB X7-7 Table 8: Interim Target GPCD

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target	10-15 year Baseline GPCD	**2015 Interim Target GPCD**
171	214	**192**

5.8 2015 Compliance Daily Per Capita Water Uses

Law

10608.24(a) Retail suppliers shall meet their interim target by December 31, 2015.

10608.40 Retail suppliers shall report on their progress in meeting their water use targets. This data shall be reported in using a standardized form.

In accordance with the requirement IRWD has reported its progress in meeting the water use targets using the standardized SBX7 Tables. IRWD's 2015 interim target is 192 GPCD, and its 2020 target is 171 GPCD. IRWD's actual GPCD for 2015 was 129, which is well within compliance of its interim target of 192 GPCD. As indicated in SB X7-7 Table 9 below, IRWD has achieved its targeted reduction for 2015.

SB X7-7 Table 9: 2015 Compliance

Actual 2015 GPCD	2015 Interim Target GPCD	TOTAL Adjustments	Adjusted 2015 GPCD	2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
129	192	0	129	129	**YES**

IRWD has not only met its 2015 interim target of 192 GPCD, but has also met its 2020 target of 171 GPCD. This demonstrates the effectiveness of IRWD's recent drought response, its long-term commitment to ongoing water efficiency discussed in Chapter 9, and its investments into the development of sustainable supplies, including recycled water.

5.9 Regional Alliance

As a retail agency, IRWD has the option of complying individually or participating in a Regional Alliance. IRWD chose to participate in a Regional Alliance with MWDOC. Each agency within the MWDOC Regional Alliance calculates its own individual target, as if it were complying

individually. The individual targets for each agency are then weighted by the supplier's population to develop a regional target. In the event that the region does not comply with the regional target, an agency may still be in compliance if it meets its own individual target. Information on the Regional Alliance target calculations and compliance is contained within MWDOC's UWMP.

6. SYSTEM SUPPLIES

Law

10631(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 as described in subdivision (a) (10631(b)).

10631(b) Is groundwater identified as an existing or planned source of water available to the supplier ... (10631(b))?

10620(f) Describe water management tools and options to maximize resources and minimize the need to import water from other regions.

IRWD's water supply reliability plan relies on diversifying water supplies and further maximizing local resources to meet demands. IRWD is a member agency of the MWDOC, which is a wholesale importer and member agency of the MWD. As such, MWDOC is entitled to receive water from the available sources of MWD. IRWD receives its imported potable and non-potable supplies through MWDOC. Groundwater is an additional source of water for IRWD and is anticipated to increase in the future. In addition, recycled water currently meets a large portion of the landscape irrigation demands within IRWD's service area.

6.1 Purchased or Imported Water

Imported Potable Water Supply

Currently, approximately 27% of IRWD's potable water needs are met by potable water purchased and supplied by MWD through MWDOC. Potable imported water is delivered to IRWD at various service connections to the imported water delivery system of MWD. The majority of imported potable water is supplied from a single source; the MWD Diemer Filtration Plant (DFP) located north of Yorba Linda. Typically, the DFP receives a blend of Colorado River water from Lake Matthews through the MWD lower feeder and State Water Project (SWP) water through the Yorba Linda Feeder.

The two major transmission pipelines that deliver DFP water to the service area are the Allen-McColloch Pipeline (AMP) and East Orange County Feeder No. 2 (EOCF #2). IRWD owns 64.7 cubic feet per second (cfs) capacity in the AMP and 41.4 cfs capacity in all reaches of the EOCF #2 down to Coastal Junction. In addition to DFP imported water, IRWD also receives potable water from the Weymouth Filtration Plant via the Orange County Feeder through a capacity of 18 cfs acquired through its consolidation with Santa Ana Heights Mutual Water Company. IRWD also purchases untreated supplies from MWD, as needed, to supplement its recycled water system during peak demand periods. This is discussed below under "Imported Non-Potable Water Supply".

Imported Non-Potable Water Supply

IRWD's non-potable water supplies consist of recycled water, untreated imported water, surface water and non-potable groundwater. IRWD purchases untreated water through MWDOC which is a member agency of MWD. Untreated purchased water is primarily used to meet certain agricultural and landscape demands that cannot be met with recycled water and to supplement recycled water system during peak months. The imported untreated water pipeline is delivered through the shared Baker Pipeline connected to MWD's system. IRWD's original capacities in the Baker Pipeline include 52.70 cfs in the first reach, 12.50 cfs in each of the second, third and fourth reaches and 7.51 cfs in the fifth reach of the pipeline. After 2016, the Baker Water Treatment Plant (WTP) will treat non-potable imported water and surface water (see Future Water Supplies). IRWD's existing Baker Pipeline capacities have been apportioned to the Baker WTP participants based on Baker WTP capacity ownership. IRWD retains 10.5 cfs of the pipeline capacity for potable supply through the Baker WTP and retains 36 cfs in first reach of the pipeline for non-potable supply.

DWR Tables 6-8 and 6-9 later in this Chapter 6 include IRWD's current and projected purchased supplies (potable and non-potable) for 2015 and through 2035. These capacities do not represent IRWD's total connected delivery capacity through MWD and MWDOC.

6.2 Groundwater

Law

Provide a copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management (10631(b)(1)).

Provide a description of any groundwater basin or basins from which the urban water supplier pumps groundwater (10631(b)(2)).

(Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree (10631(b)(2)).

For basins that have not been adjudicated, provide information as to whether the department has identified the basin as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official department 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 (10631(b)(2)).

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. (10631(b)(3)).

Basin Description

Over 50 percent of IRWD's overall supply comes from local groundwater wells in the Orange County Groundwater Basin (Basin), and the Irvine and Lake Forest Sub-basins. IRWD is an operator of groundwater-producing facilities in the main portion of the Basin and the Sub-basins.

The Orange County Water District (OCWD) manages the areas of the Basin that are located within the OCWD boundary under the Orange County Water District Act, Water Code App., Ch 40 (Act). The Irvine Sub-basin is located within the OCWD boundary but the Lake Forest area sub-basin is outside of the OCWD boundary. OCWD manages the Basin for the benefit of municipal, agricultural and private groundwater producers and is responsible for the protection of water rights to the Santa Ana River in Orange County as well as the management and replenishment of the Basin. Producers may install and operate production facilities under the Act; OCWD approval is not required.

Orange County Groundwater Basin

As stated in the OCWD Groundwater Management Plan 2015 Update, the Basin covers approximately 350 square miles bordered by Chino Hills to the north, the Santa Ana Mountains the northeast and Pacific Ocean to the southwest. Measured recharge consists of all water artificially recharged at OCWD's forebay recharge facilities and water injected at the Talbert Barrier and on the Orange County side of the Alamitos Barrier. Groundwater conditions in the Basin are influenced by the natural hydrologic conditions of rainfall, groundwater seepage and stream flow. Incidental recharge accounts for a significant amount of the Basin's producible yield including precipitation and subsurface inflow. The recent average production from the main Basin is approximately 330,000 AFY. IRWD produces the majority of its groundwater primarily from the main portion of the Basin.

Irvine Sub-Basin

IRWD also produces non-potable supplies from the Irvine Sub-basin. The Irvine Sub-basin forms the southern-most portion of the Basin. Just as the rest of the main Basin, of which this Sub-basin is a part, the OCWD provides governance and management under the Act. This Sub-basin has a perennial groundwater yield estimated at 13,000 AF, and the groundwater in this basin is generally higher in total dissolved solids, color and nitrates. IRWD has constructed facilities to treat some of the water produced for potable use through the Irvine Desalter Project. The Irvine Desalter began operations in 2007 and has the capacity to produce approximately 5,600 AFY of potable water supplies.

IRWD also constructed two non-potable treatment plants to clean up the groundwater within the vicinity of the former Marine Corps Air Station, El Toro. These plants involve treatment processes to remove volatile organic chemicals to clean up the Basin and prevent a plume from reaching the main Basin. In addition, IRWD operates a few other wells which produce non-potable quality water and altogether, IRWD can produce about 4,100 AFY of non-potable water from the Irvine Sub-basin which supplements IRWD's recycled water distribution system.

Lake Forest Area Wells

IRWD also historically operated six wells within the Lake Forest area sub-basin which has low production capability. Currently IRWD produces approximately 340 AFY of potable water from this groundwater area. IRWD is currently evaluating the future use of other wells in this area.

Groundwater Management

OCWD is the groundwater manager over the main Basin, including the Irvine Sub-basin, and the producers are the local retailers of the groundwater supplies. OCWD has prepared a Groundwater Management Plan, last updated in July 2015 (http://www.ocwd.com/media/3503/groundwatermanagementplan2015update_20150624.pdf).

The Groundwater Management Plan identifies OCWD's goals and management objectives in protecting and managing the Basin. This plan describes Basin hydrogeology, water supply monitoring, management and operation of recharge facilities, groundwater replenishment system, seawater intrusion monitoring and barrier management, and water quality protection. IRWD has not, nor have any other Basin groundwater producers, adopted OCWD's Groundwater Management Plan. IRWD is a producer of groundwater in the OCWD-managed portion of the Basin, and does not have any jurisdictional authority or authorization for groundwater management of this portion of the basin. Therefore, it is not appropriate for IRWD to adopt OCWD's Groundwater Management Plan.

Changes to groundwater management under the Sustainable Groundwater Management Act (SGMA) are beginning to be implemented. The regulations for Groundwater Sustainability Plans were just recently adopted (May 2016), and were not available during the time of the preparation of the 2015 UWMP. Therefore, per the "2015 UWMP Guidebook for Urban Water Suppliers", the new requirements for groundwater management under SGMA will not apply to the 2015 UWMPs.

The Lake Forest area sub-basin, in which IRWD operates wells, is located outside the OCWD boundary. Under SGMA, IRWD will assist OCWD in preparing an alternative groundwater sustainability plan to cover this Lake Forest sub-basin.

OCWD manages the Basin to allow utilization of up to 500,000 AF of storage capacity of the Basin during dry periods, acting as an underground reservoir and buffer against drought. OCWD operates the Basin to keep the target dewatered Basin storage at 200,000 AF as an appropriate accumulated overdraft. OCWD has made substantial investment in facilities, Basin management and water rights protection, resulting in the elimination and prevention of adverse long-term "mining" overdraft conditions.

OCWD's planning documents examine future Basin conditions and capabilities, water supply and demand, and identified projects to meet increased replenishment needs of the Basin. With the implementation of OCWD's preferred projects in its Long Term Facilities Plan, OCWD expects the Basin yield in the year 2035 to be increased. The amount that can be produced will be a function of which projects will be implemented by OCWD and how much increased

recharge capacity is created by those projects, total demands by all producers, and the resulting Basin Production Percentage (BPP) that OCWD sets based on these factors.

Replenishment supplies for the Basin include capture of increasing Santa Ana River flows, purified recycled water, purchases of water from MWD, and expansion of local supplies. OCWD's Groundwater Replenishment System (GWRS) has been producing advanced treated recycled water since 2008. At the GWRS, wastewater (sewage) is purified using a three-step process to produce high-quality water used to recharge the Basin and for injection into the seawater intrusion barrier. The GWRS was expanded in 2015 from 72,000 AF annual production to 100,000 AF per year.

Overdraft Conditions

The Basin is located in the area designated by the DWR as the Coastal Plain of Orange County Groundwater Basin, Basin 8-1, in Bulletin 118 (DWR, 2003). Bulletin 118 (2003) characterizes the condition of the Basin and the Bulletin does not identify the Coastal Plain of Orange County Groundwater Basin as in overdraft condition.

OCWD calculates and reports accumulated overdraft in its annual Engineers Report, however "overdraft" in the traditional sense does not exist in the Basin because the Basin is operated to continuously fluctuate within the safe operating range (OCWD Groundwater Management Plan). OCWD's Act defines annual groundwater overdraft to be the quantity by which production exceeds the natural replenishment of the Basin. Accumulated overdraft is defined to be the quantity of water needed in the Basin forebay to prevent landward movement of seawater into the fresh groundwater body. However, OCWD has constructed seawater intrusion control facilities since the Act was written, which have been effective in preventing seawater intrusion into the Basin. OCWD's efforts being undertaken to eliminate long-term overdraft in the Basin are described in OCWD's Groundwater Management Plan (see Groundwater Management section). As described under the "Groundwater Management" under SGMA, Groundwater management will change. However, these new requirements for groundwater management under SGMA will not apply to the 2015 UWMPs.

Historical Groundwater Pumping

For many years, IRWD received almost all of its water from imported sources. To alleviate this dependency on costly imported water, IRWD began to develop a series of local wells in 1979. The majority of the potable groundwater supply to IRWD is produced from the Dyer Road Well Field (DRWF) located in the City of Santa Ana, which is connected to IRWD's potable distribution system. The DRWF consists of 16 wells pumping from the clear water zone of the Basin and two wells (with colored-water treatment facilities) pumping from the deep, colored-water zone of the Basin. The colored-water portion of the DRWF is sometimes referred to as the Deep Aquifer Treatment System or DATS. Under Agreement, there is an "equivalent" BPP established for the DRWF, currently 28,000 AFY consisting of 20,000 AFY of clear groundwater and an additional 8,000 AFY of "matching" clear groundwater, provided a minimum of 8,000 AFY of colored groundwater is pumped from the deep aquifer zone. IRWD also owns and operates a groundwater production well in the City of Orange which serves up to

900 AFY of demands within IRWD's Orange Park Acres service area. IRWD also constructed and operates the Wells 21 and 22 Desalter in the City of Tustin which removes total dissolved solids (TDS) and nitrates from two nearby wells for potable use. Annual yield from Wells 21 and 22 can be up to 6,400 AF per year.

Groundwater production is managed by the OCWD through financial incentives. The framework for the financial incentives is based on OCWD establishing the BPP each year. The BPP is the ratio of groundwater production to total water demands expressed as a percentage. Groundwater production above the BPP is charged a Basin Equity Assessment (BEA), which is set so that the cost of groundwater pumping above the BPP is similar to the cost of imported water. Each year, OCWD sets a target amount of pumping, the BPP, and assesses a BEA on all water pumped above that limit. Current practice of the OCWD prohibits consideration of recycled water when determining the amount of water IRWD can pump from the Basin each year without having to pay the BEA. For 2015, OCWD adopted a BPP of 70%.

DWR Table 6-1 below shows IRWD's groundwater pumped over the past five years for the Basin and the Sub-basins.

DWR Table 6-1: Groundwater Volume Pumped

Groundwater Type *Drop Down List* *May use each category multiple times*	Location or Basin Name	2011	2012	2013	2014	2015
Add additional rows as needed						
Alluvial Basin	Orange County Groundwater Basin	34275.1	37058.6	38616.9	43415.5	40655.6
Alluvial Basin	Irvine Subbasin	7055.1	7058.6	8629.4	10994.9	9840.2
Alluvial Basin	Los Alisos Area	0	0	281.8	375.7	336.4
	TOTAL	41,330	44,117	47,528	54,786	50,832

6.3 Surface Water

IRWD, along with neighboring agency (Serrano Water District), has a permit and licenses to appropriative rights to the flows of Santiago Creek and IRWD has rights to diversion by storage at Santiago Dam (Irvine Lake) for a total of 28,000 AFY. IRWD currently utilizes its Irvine Lake supplies for agricultural irrigation and to supplement its recycled water system during peak periods. Serrano Water District which owns 25% of the capacity in Irvine Lake treats water for domestic use. Since the base flow from the catchment is very low, the annual yield variation from the reservoir may be extreme, from a few hundred acre-feet per year to overflow conditions. Based on averaging historical data, IRWD's share of the Santiago Creek local runoff that is captured in the Irvine Lake is about 4,000 AF per year and about 1,000 AF per year in dry years.

IRWD is currently constructing the Baker Water Treatment Plant (WTP), a joint regional project with four other south Orange County water districts (El Toro Water District, Moulton

Niguel Water District, Santa Margarita Water District and Trabuco Canyon Water District). The project will provide increased water supply reliability by increasing local treatment capability from multiple water supply sources including imported untreated water from MWD and through the local surface water in Irvine Lake. The Baker WTP is expected to be online in 2016, and therefore all Irvine Lake surface water will be treated for potable use and will no longer be a supplemental recycled water supply.

6.4 Stormwater

IRWD currently does not have any stormwater recovery systems.

6.5 Wastewater and Recycled Water

Law

10633 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.

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.

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.

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.

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.

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.

10633(f) Describe the action, 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.

10633(g) 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.

Water recycling is an essential component of IRWD's water supply portfolio, as any demand met with recycled water reduces the demand for high-quality drinking water. IRWD has a very successful recycled water program which began in the mid-1960's when IRWD began collecting sewage (wastewater) and treating it to serve recycled water primarily to agricultural fields. Today, recycled water meets approximately 28 percent of IRWD's service area water demands. IRWD serves recycled water for many State-approved uses including landscape irrigation, agricultural irrigation, toilet flushing, cooling towers, industrial processes, composting, grading and compaction. IRWD's recycled water program has allowed IRWD to reduce its demands for potable, imported water and extend its drinking water supplies.

Recycled Water Coordination

IRWD has an extensive dual distribution system, which delivers recycled water from its two recycling treatment plants, the Michelson Water Recycling Plant (MWRP) and the Los Alisos Water Recycling Plant (LAWRP). The largest plant, the MWRP, is located in Irvine and uses both activated sludge and membrane bio-reactor technology to produce disinfected tertiary recycled water. The end result of the MWRP process is high-quality recycled water that earned IRWD the first unrestricted use permit issued in the state allowing recycled water to be used for virtually everything but drinking. The permitted tertiary treatment capacity of the MWRP is currently 28.0 million gallons per day (mgd). The efficiency of MWRP recycled water production has been estimated to be approximately 90% of the sewage inflow to the plant. IRWD is currently constructing a biosolids digester facility at MWRP. This will allow IRWD to digest and dehydrate sludge which will then be converted to pelletized fertilizer.

IRWD also owns and operates the LAWRP, located in Lake Forest, which is a separate sewage treatment system from MWRP with tertiary treatment capacity of 5.5 mgd. The Lake Forest sewer collection system consists of 105 miles of pipe and one lift station which delivers sewage to the LAWRP. Secondary effluent from the treatment plant is pumped to either the tertiary treatment facility where it is treated for reuse in IRWD's Lake Forest area recycled water distribution system or, if demands are low, to the South Orange County Wastewater Authority (SOCWA) pumping station which directs its flows to the SOCWA effluent transmission mains and subsequent ocean outfall.

Treated effluent produced at both plants meets the water quality standards set forth in the California Administrative Code (CAC), Title 22, Division 4 (Title 22) for use as recycled water. IRWD has invested in seasonal storage reservoirs which store excess recycled water during the winter months when irrigation demands are lower for use in the peak summer months. IRWD may also sell excess recycled water from MWRP to the OCWD, Green Acres Project (GAP) from October through March, and provide excess recycled water from LAWRP to neighboring Santa Margarita Water District (SMWD) on an as-needed and as-available basis. After storage and sales to others, any additional excess sewage would then be discharged to the Orange County Sanitation District (OCSD) or SOCWA for treatment and either reuse or ocean discharge. IRWD also maintains a connection to the OCSD where wastewater undergoes further treatment and is ultimately discharged to the ocean. IRWD joined the OCSD in order to secure backup capacity for sewage treatment and disposal as needed.

The table below (IRWD Table 3) shows the agencies that IRWD coordinates with for delivery of its excess sewage or recycled water and the role those agencies fulfill. Per CWC 10633, IRWD prepared this UWMP update in coordination with the planning agencies (cities and County of Orange) within its service area. There are no other local water, wastewater, or groundwater agencies that operate within IRWD's service area.

IRWD Table 3: Recycled Water Coordination

Agency	Role
Orange County Sanitation District	Treat and reuse
South Orange County Wastewater Authority	Treat and reuse as demands warrant
OCWD Green Acres Project	Distribution and reuse
Santa Margarita Water District	Treat and reuse

Wastewater Collection, Treatment, and Disposal

This section summarizes the collection and treatment of wastewater generated within IRWD's service area.

IRWD has an extensive sewage collection system which serves much of its service area. IRWD collects and treats nearly all of the sewage generated within its service area. Sewage collected through IRWD's system is sent to one of two of IRWD's water recycling plants, the MWRP or LAWRP. The majority of the sewage generated in IRWD's service area is treated to disinfected tertiary recycled water standards and then used within the service area for non-potable purposes thus offsetting potable water demands.

As stated, a few small portions of IRWD's service area are not served by the MWRP or LAWRP sewage collection and treatment systems. A small percentage of sewage generated within IRWD's service area is currently collected by neighboring OCSD or SMWD where these agencies' facilities treat the sewage for subsequent reuse. Additionally, there are two small areas outside of IRWD's water service area where IRWD currently collects a small amount of sewage flows. These small flows from outside of the service area come from the City of Santa Ana and the El Toro Water District.

DWR Table 6-2 below shows total sewage collection within IRWD's service area for 2015. This data includes the volume of IRWD-collected sewage and amounts that go to other agencies for treatment and reuse.

DWR Table 6-2: Wastewater Collected Within IRWD's Service Area in 2015

Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
Add additional rows as needed						
IRWD1	Metered	22,267	IRWD	MWRP	Yes	No
IRWD	Metered	3,805	IRWD	LAWRP2	Yes	No
OCSD	Metered	7,288	OCSD	OCSD	Yes	No
SMWD	Estimated	529	SMWD	Chiquita Water Reclamation Plant	No	No
Total Wastewater Collected from Service Area in 2015:		33,890				

DWR Table 6-3 below provides the volume of treated sewage either recycled or disposed of within IRWD's service area, where the treatment occurred for 2015 and the disposition of the treated water. This includes sewage that originated from outside of IRWD's service area as discussed above.

DWR Table 6-3: Wastewater Treatment and Discharge Within IRWD's Service Area in 2015

Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal *Drop down list*	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level *Drop down list*	2015 volumes			
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Add additional rows as needed										
MWRP					Yes	Tertiary	22,267		20,395	
MWRP	OCSD1	OCSD			Yes			1,872		
LAWRP	Los Alisos	SOCWA Outfall & RW Distribution		Ocean outfall	Yes	Secondary, Disinfected - 2.2	3,805	1,335	2,471	
						Total	26,073	3,207	22,866	0

Recycled Water System

IRWD has an extensive dual distribution system, which delivers recycled water from its two recycling treatment plants, the MWRP and the LAWRP. Treated effluent produced at both plants meets the water quality standards set forth in the California Administrative Code (CAC), Title 22, Division 4 (Title 22) for use as recycled water.

The MWRP produces high-quality recycled water that earned IRWD the first unrestricted use permit issued in the state, allowing recycled water to be used for virtually everything but drinking. The permitted tertiary treatment capacity of the MWRP is currently 28.0 mgd. IRWD is currently constructing a biosolids digester facility at MWRP. This will allow IRWD to digest and dehydrate sludge which will then be converted to pelletized fertilizer.

IRWD also owns and operates the LAWRP, which is a separate sewage treatment system from MWRP with tertiary treatment capacity of 5.5 mgd. The Lake Forest sewer collection system consists of 105 miles of pipe and one lift station which delivers sewage to the LAWRP. Secondary effluent from the treatment plant is pumped to either the tertiary treatment facility where it is treated for reuse in IRWD's Lake Forest area recycled water distribution system. If demands for recycled water are low, it is discharged to the SOCWA pumping station which directs its flows to the SOCWA effluent transmission mains and subsequent ocean outfall.

Discharge/Use of Recycled Water

Sewage is discharged primarily due to the fact that IRWD only produces recycled water to meet recycled water demands. During winter months, irrigation demands are lower and therefore less recycled water is produced. IRWD has several seasonal storage reservoirs which store excess recycled water exists during winter months. Once the reservoirs are full, IRWD may sell excess recycled water from MWRP to the OCWD GAP project during the months from October through March. Some excess recycled water from LAWRP may be delivered to the SMWD on an as-needed and as-available basis.

IRWD supplies recycled water to its customers through a recycled water distribution pipeline system of over 500 miles. To support the over 5,400 recycled water meters that currently use approximately 30,000 AF of recycled water annually, IRWD has incorporated 15 reservoirs (3 lakes and 12 tanks) with storage capacity of 4,536 AF (1.48 trillion gallons). The following table (IRWD Table 4) lists IRWD's existing recycled water reservoirs and corresponding capacity.

IRWD Table 4: IRWD's Recycled Water Reservoirs

Facility	Capacity
San Joaquin Reservoir (open lake)	814 million gallons
Rattlesnake Reservoir (open lake)	359 million gallons
Sand Canyon Reservoir (open lake)	250 million gallons
Zone A North Reservoir (tank)	5 million gallons
East Irvine Zone B Reservoir (tank)	5 million gallons
Coastal Zone G Reservoir (tank)	2.6 million gallons
Coastal Zone D Reservoir (tank)	5 million gallons
Northwood 5 Zone B Reservoir (tank)	5 million gallons
Zone A South Reservoir (tank)	10 million gallons
Lake Forest Zone A #2 Reservoir (tank)	2 million gallons
Lake Forest Zone B West Reservoir (tank)	7.8 million gallons
Lake Forest Zone B East Reservoir (tank)	7.8 million gallons
Lake Forest Clearwell #1	2 million gallons
Portola Springs Zone C Reservoir (tank)	2.2 million gallons
Portola Springs Zone D Reservoir (tank)	0.66 million gallons
Total	1,478 million gallons

IRWD also supplements its recycled water system with non-potable groundwater pumped from the Basin. In the event IRWD does not have sufficient recycled water supplies to meet customer

demands, IRWD can also supply the recycled water system with untreated, imported water. This water supply is introduced into the system via Irvine Lake and conveyed through IRWD's Irvine Lake Pipeline. IRWD has 19 pump stations and 13 pressure zones that serve the recycled water system.

Recycled Water Beneficial Uses

In 1967 when IRWD began sewage collection and tertiary treatment at its MWRP, the recycled water was delivered to agricultural users. IRWD later expanded recycled water use to include landscape irrigation at parks, golf courses, school grounds and play fields, community associations, open space area, and green belts. IRWD eventually made recycled water available for front and backyard irrigation at large estate-sized residential lots, toilet and urinal flushing at large commercial dual-plumbed buildings, carpet dying, composting, construction dust control, compaction, and cooling tower applications.

Water recycling is an essential component of IRWD's water supply portfolio, as any demand met with recycled water reduces the demand for high-quality drinking water. IRWD meets approximately 28% of its total demands with recycled water, thereby reducing demands for potable, imported water. The use of recycled water extends IRWD's drinking water supplies, reduces the need for additional potable water facilities, reduces the amount of treated wastewater discharged into the ocean, reduces reliance on costly imported water supplies, and increases water supply reliability. The use and expansion of recycled water will assist IRWD in providing water for future needs, while decreasing dependence on imported water. The increased use of recycled water has and will assist IRWD in its ongoing compliance with its 2020 GPCD targets.

DWR Table 6-4 below shows all current and projected recycled water uses within IRWD's service area.

DWR Table 6-4: Current and Projected Recycled Water Direct Beneficial Uses within IRWD

Beneficial Use Type		General Description of 2015 Uses	Level of Treatment *Drop down list*	2015	2020	2025	2030	2035
Agricultural irrigation			Tertiary	3,276	561	805	1,045	1,286
Landscape irrigation (excludes golf courses)			Tertiary	21,907	24,498	27,156	27,440	27,725
Golf course irrigation								
Commercial use			Tertiary	245	250	250	250	250
Industrial use			Tertiary	50	50	50	50	50
Geothermal and other energy production								
Seawater intrusion barrier								
Recreational impoundment								
Wetlands or wildlife habitat								
Groundwater recharge (IPR)*								
Surface water augmentation (IPR)*								
Direct potable reuse								
Other	Type of Use	Construction, lake filler, and dual plumbed residential	Tertiary	771				
			Total:	26,249	25,359	28,261	28,786	29,311

Current and Planned Uses of Recycled Water

DWR Table 6-5 shows IRWD's actual 2015 recycled water use compared with the projected recycled water use in its 2010 UWMP.

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

Use Type		2010 Projection for 2015	2015 Actual Use
Agricultural irrigation		1,500	4,013
Landscape irrigation (excludes golf courses)		23,115	27,396
Golf course irrigation			
Commercial use		250	391
Industrial use			
Geothermal and other energy production			
Seawater intrusion barrier			
Recreational impoundment			
Wetlands or wildlife habitat			
Groundwater recharge (IPR)			
Surface water augmentation (IPR)			
Direct potable reuse			
Other	*Type of Use*		
Total		24,865	31,800

NOTES: Commercial 2015 actual values include Industrial use as well.

Actions to Encourage and Optimize Future Recycled Water Use

IRWD was formed in 1961 when its service area was largely undeveloped. As development occurred, IRWD worked with developers to design and construct the infrastructure to deliver recycled water to new communities. Those developers, which were responsible for constructing schools, parks, homeowner's associations, and other community facilities, designed those sites to use recycled water. As a result, most of IRWD's recycled water customers are due to new construction as compared to retrofitting existing communities. This same approach is being implemented today as IRWD connects approximately 150 new recycled water sites each year. In 1991, IRWD worked with a commercial high-rise developer to construct the first dual-plumbed commercial building in California in which recycled water is used for toilet and urinal flushing in the building. IRWD currently serves more than 65 dual-plumbed buildings including a private high school and a public middle school. There are more dual-plumbed buildings in design and construction.

In 1994, IRWD worked with a residential developer to design single-family residential property to use recycled water to irrigate the front and back yard landscaping. Today IRWD serves over 600 such properties and will ultimately serve 750 properties in this manner. IRWD also serves cooling towers, a composting operation, a carpet dyer, and construction sites, and continually seeks opportunities to further expand the distribution system to serve any state approved uses.

It is IRWD's goal to effect conservation of water resources whenever possible. IRWD collects, treats and recycles sewage for approved beneficial uses. It is IRWD's intent to provide customers with recycled water in lieu of potable water for all approved uses. IRWD has found that its customers are supportive and interested in using recycled water for landscape and industrial purposes as a reliable source of supply. Recycled water rates are lower than potable rates, which provide an incentive for customers to use recycled water. IRWD may also provide financial incentives when feasible for customers to retrofit from potable water to recycled water use.

DWR Table 6-6 shows IRWD's Methods to Expand Recycled Water Use. However, because IRWD already has a "Mandatory Use" requirement for recycled water for all new construction for landscape use, financial incentives currently only apply to retrofitting potable or other imported water connections with recycled water.

DWR Table 6-6: Methods to Expand Future Recycled Water Use

Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Add additional rows as needed			
Financial Incentives for Customers	IRWD may grant or loan funds to help pay for on-site improvements to facilitate the use of recycled water.	On-Going	200
		Total	200

6.6 Desalinated Water Opportunities

Law

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

A number of sites in Southern California are currently being considered for ocean water desalination facilities. Currently, the OCWD is evaluating a proposed seawater desalination facility at a site in Huntington Beach in Orange County. The proposed project would be constructed by Poseidon Resources, a private company, and would consist of the construction and operation of a 50 mgd ocean water desalination facility. The proposed project would distribute potentially to coastal and southern Orange County retailers. The project is still pending approval from the California Coastal Commission.

IRWD is evaluating any potential impacts that proposed ocean desalinated water could have on its potable and recycled water quality. Currently, IRWD does not anticipate receiving any water from this facility; however, any water delivered to IRWD through a future ocean desalination facility would offset potable water imported through MWD.

6.7 Exchanges or Transfers

Law

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

In addition to developing its local groundwater and recycled water systems, the District has diversified its water supply reliability by developing water banking projects in Kern County, California. Over the past 20 years, local water districts in Kern County have been on the forefront of the development of groundwater banking programs that benefit agencies on both sides of the storage agreements. IRWD has constructed a fully operational water banking program that makes it possible for IRWD and its banking partners to store excess water during "wet" hydrologic periods. The stored water is then available for use during "dry" periods to offset reduced water supplies under periods of severe drought or during periods of supply interruptions.

IRWD has constructed the Strand Ranch Integrated Banking Project and the Stockdale Integrated Banking Project (Water Bank). The District's Water Bank properties are situated on groundwater recharge lands that overlie the regional Kern County groundwater basin where the water is stored. Water Bank facilities provide IRWD with the ability to respond to drought conditions and other potential water supply interruptions when normal supplies may be reduced.

To operate its water bank, the District has entered into a 30-year water banking partnership with the Rosedale-Rio Bravo Water Storage District (Rosedale) in Kern County. The District's partnership program with Rosedale provides long-term equity ownership of water banking capacity rather than typical contract or lease arrangements employed by most other agencies.

Through the Water Bank facilities and agreements, IRWD has developed 135,500 AF of storage capacity, 47,800 AF of recharge capacity and 35,100 AF of recovery capacity. IRWD has entered into a Coordinated Operating and Water Exchange Agreement with MWD and MWDOC which allows IRWD to have State Water Project (SWP) water recovered from the Water Bank delivered to IRWD's service area. In 2014, IRWD and MWD entered into an agreement for transferring non-SWP water into IRWD's service area. Under this agreement, in 2015, IRWD recovered and delivered 1,000 AF of its non-SWP water to its service area. This was used July 1, 2015 through February 2016 as extraordinary supply to supplement reduced imported supplies during MWD's water supply allocation.

IRWD has also secured access to SWP supplies that can be stored in the Water Bank. IRWD acquired approximately 883 acres (the "Jackson Ranch") located within the Dudley Ridge Water District and its associated rights of to up to 1,749 AF of SWP Table A water. Additionally, the land acquisition included certain participation rights in the Kern Water Bank to store approximately 9,500 AF of water.

In 2015, IRWD began developing additional recovery and conveyance capacity through partnership with Rosedale and Castaic Lake Water Agency (CLWA). IRWD's participation will

consist of 50% of the recovery capacity of six wells and associated conveyance facilities constructed on Rosedale property adjacent to Strand Ranch for joint use by the District and CLWA. The additional recovery will provide additional instantaneous recovery capacity to supplement IRWD's other Water Bank recovery capacities.

Since 2010, the District has delivered approximately 39,000 AF of water to the Water Bank facilities for storage for IRWD and its banking partners. The majority of this stored water was made available through a 28-year Exchange Agreement that the District has with the Buena Vista Water Storage District in Kern County and agreements with two separate State Water Project Contractors with excess SWP water. The terms of these agreements require that half of the water be returned to the originating water districts within 5 to 10 years with the balance of the water being available to the District for its use. As of June 30, 2015, IRWD has approximately 22,000 AF of water in storage at its water banking facilities and related programs. IRWD has returned all of its banking partners' stored water since 2010.

6.8 Future Water Projects

Law

> 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.

IRWD is currently constructing the Baker Water Treatment Plant (WTP), a joint regional project with four other south Orange County water districts (El Toro Water District, Moulton Niguel Water District, Santa Margarita Water District and Trabuco Canyon Water District). The project will provide increased water supply reliability by increasing local treatment capability from multiple water supply sources including imported untreated water from MWD and through the local surface water in Irvine Lake. The Baker WTP is expected to be online in fall 2016, and therefore all Irvine Lake surface water will be treated for potable use and will no longer be a supplemental recycled water supply.

IRWD all plans to pursue the development of additional groundwater facilities in the Basin and Subbasins to serve future potable demands. These groundwater supplies are considered to be under development. IRWD projects that new groundwater production would be developed to be online to meet potable demands by the year 2025.

DWR Table 6-7 below shows IRWD's expected future projects and the anticipated increase in water supply. These water supplies are expected to be available under all scenarios normal, single-dry and multiple-dry years.

DWR Table 6-7: Expected Future Water Supply Projects or Programs

Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type	Expected Increase in Water Supply to Agency
	Drop Down List (y/n)	*If Yes, Agency Name*			*Drop Down List*	*This may be a range*
Add additional rows as needed						
Baker Water Treatment Plant	Yes	Multiple Agencies		2016	All Year Types	6,858
Future Groundwater Production	No			2025	All Year Types	12,352

6.9 Summary of Existing and Planned Sources of Water

Law

10631(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 the subdivision 10631(a).

10631(b)(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.

DWR Table 6-8 below provides the actual source and volume of potable and non-potable water used for the year 2015. DWR Table 6-8 does not represent IRWD's total groundwater supply capabilities or total connected delivery capacity through MWD and MWDOC. DWR Table 6-9 below provides total projected supply capacities expected to be available to IRWD through 2035. These future available water supply projections are based on historical groundwater production, planned future supply projects, as well as information from MWD and MWDOC's 2015 UWMPs.

DWR Table 6-8: Water Supplies - Actual

Water Supply	Additional Detail on Water Supply	2015		
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		Actual Volume	Water Quality *Drop Down List*	Total Right or Safe Yield *(optional)*
Add additional rows as needed				
Purchased or Imported Water	MWD	12,790	Drinking Water	
Purchased or Imported Water	MWD	5,906	Raw Water	
Surface water	Irvine Lake	2,826	Raw Water	
Groundwater		46,770	Drinking Water	
Groundwater	Non-potable	4,063	Recycled Water	
Recycled Water	MWRP & LAWRP	22,866	Recycled Water	
	Total	95,220		0

DWR Table 6-9: Water Supplies - Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*							
		2020		2025		2030		2035	
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Add additional rows as needed									
Purchased or Imported Water	Potable	41,929		41,929		41,929		41,929	
Groundwater	Potable	53,171		65,523		65,523		65,523	
Purchased or Imported Water	Untreated	17,826		17,826		17,826		17,826	
Recycled Water		28,757		28,757		28,757		28,757	
Groundwater	Nonpotable	3,514		3,514		3,514		3,514	
	Total	145,197	0	157,549	0	157,549	0	157,549	0

7. WATER SUPPLY RELIABILITY ASSESSMENT

Law

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.

10631(c)(1) Described the reliability of the water supply and vulnerability to seasonal or climate shortage, to the extent practicable, and provide data for each of the following: an average year, a single dry water year, and multiple dry water years.

10634 The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the suppler 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.

10620(f) Describe water management tools and options to maximize resources and minimize the need to import water from other regions.

IRWD's water supply management efforts are aimed at maximizing the efficient use of existing supplies to assure adequate supplies will be available to meet future water demands. Under IRWD's supply model, adequate supplies exist to meet demands. IRWD's supplies remain essentially constant between normal, single-dry and multiple-dry years. This is due to the fact that groundwater and imported water account for all of IRWD's potable supply, and recycled water, groundwater and imported water comprise nearly all of IRWD's non-potable supply (See also Chapter 6).

7.1 Water Quality

It is IRWD's top priority to provide customers with safe, high quality drinking water. IRWD's drinking water is safe and meets or exceeds all quality standards set by both the state and federal government. IRWD's water quality staff continuously monitors the water supply, conducting over a quarter of a million laboratory tests each year from water taken from over 100 sample points throughout the District. IRWD owns and operates a state-of-the-art Water Quality Laboratory that is state certified and one of the best equipped water laboratories in Southern California. IRWD produces an informative Annual Water Quality Report for its customers. The Water Quality Report provides information on the source of the water, water testing results and how water quality compares with regulatory standards. Additionally, the report answers commonly asked questions about water quality.

Per MWD's 2015 UWMP, MWD has reviewed and addressed its concerns of water quality in its water management programs. MWD responds to water quality concerns by concentrating on protecting the quality of the source water and development of water management programs that maintain and enhance water quality. Contaminants that cannot be sufficiently controlled through

protection of source waters are handled through changed water treatment protocols or blending. These practices can increase the costs and or reducing operating flexibility and safety margins. In addition, MWD has developed enhanced security practices and policies in response to national security concerns. (MWD's 2015 UWMP).

IRWD has not experienced and does not foresee any constraints to its water supplies or water supply capacities resulting from water quality impacts.

7.2 Reliability by Type of Year

Law

> 10631(c)(1). Describe the reliability of the water supply and vulnerability to seasonal or climatic shortages, 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.
>
> 10635(a) Every urban water supplier shall include, as part of it 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.

As mentioned, as a sub-member agency of MWD under MWDOC, IRWD is aware of current and future imported water challenges and IRWD has worked to diversify its water supplies to reduce dependency on imported water. IRWD's water resources program relies on further maximizing local resources to meet demands through increased recycled water use, increased groundwater development, groundwater treatment, conservation and groundwater banking opportunities.

Discussed further below under "Groundwater Management" and also in Chapter 6, OCWD has made substantial investment in facilities, Basin management and water rights protection and OCWD continues to develop new replenishment supplies, recharge capacity and basin protection measures to meet projected production from the Basin during normal and drought periods.

Imported water supplies will remain a source of supplemental supply for IRWD, as well as redundancy supply in the event of shutdowns or local outages. As to IRWD's assessment of the reliability of imported water, MWD's 2015 UWMP shows that MWD has sufficient supply capabilities to meet expected demands from 2020 through 2040 under a repeat of the 1990-1992 multiple dry-year hydrology and the 1977 single dry-year hydrology. MWD's reliability is further discussed below under "Imported Water Management".

IRWD's recycled water production also remains constant, and is considered "drought-proof" as a result of the fact that sewage flows remain virtually unaffected by dry years. Only a small portion of IRWD's supply, native water captured in Irvine Lake, is likely to be affected by single dry and multiple dry years.

Based on its diversified water supply portfolio, IRWD finds that its supplies have remained essentially constant between normal, single-dry and multiple dry years. Based on IRWD's assessment of its available water supplies and the historic reliability of these supplies, IRWD finds that it will be reliable under single-dry and multiple dry years. IRWD utilizes the same bases of water years from MWD's 2015 UWMP to represent past dry period through 2025. This includes a repeat of the 1990-1992 multiple dry-year hydrologies and the 1977 single dry-year hydrology. IRWD's average water year hydrology is represented by 2012.

DWR Table 7-1 below "Bases of Water Year Data" lists the years that IRWD uses as its historical average, single driest year, and driest multiple year period.

DWR Table 7-1: Basis of Water Year Data

Year Type	Base Year *If not using a calendar year, type in the last year of the fiscal or water year, for example, water year 1999-2000, use 2000*	Available Supplies if Year Type Repeats	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☐ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	% of Average Supply
Average Year	2012	135097	100%
Single-Dry Year	1977	131097	98%
Multiple-Dry Years 1st Year	1990	131097	98%
Multiple-Dry Years 2nd Year	1991	131097	98%
Multiple-Dry Years 3rd Year	1992	131097	98%
Multiple-Dry Years 4th Year *Optional*			
Multiple-Dry Years 5th Year *Optional*			
Multiple-Dry Years 6th Year *Optional*			

The following DWR Tables 7-2, 7-3 and 7-4 include IRWD's quantification of its available supplies and demand for the various types of years. DWR Table 7-2 records the data for a normal year hydrology. IRWD's supplies reported in DWR Table 7-2 are the same as reported in DWR Table 6-9 (Retail Water Supplies Projected). DWR Table 7-2 includes IRWD's supply capacities that can reasonably be relied upon to meet demands in a normal year hydrology. IRWD has made conservative estimates of annual imported supplies based on connected delivery capacity and additional supplies are expected to be available from these sources, based on legal

entitlements, historical uses and information provided by MWD. Information provided by MWD in its 2015 UWMP, as the imported water supplier, concerning the adequacy of its regional supplies, demonstrates MWD's inclusion of reserves in its regional supply assessments.

In addition, IRWD expects that the development and completion of IRWD's future planned groundwater water supplies will be required to meet IRWD's annual projected demands in the year 2035 and beyond. These future planned projects are discussed in Chapter 6. IRWD subscribes to prudent water supply and financial planning and plans the development of new supplies to be phased over time consistent with the growth in IRWD's demands.

DWR Table 7-2: Normal Year Supply and Demand Comparison

	2020	2025	2030	2035
Supply totals *(autofill from Table 6-9)*	145,197	157,549	157,549	157,549
Demand totals *(autofill from Table 4-3)*	96,445	105,961	109,431	111,277
Difference	48,752	51,588	48,118	46,272

IRWD's projected normal water demands as shown in DWR Tables 4-3 and 7-2 reflect IRWD's estimated expected demands under normal hydrologic conditions (precipitation). Lower levels of precipitation and higher temperatures can result in higher water demands, due primarily to the need for additional water for irrigation. To reflect this, IRWD's base (normal) water demands are increased 7% during both "single-dry" and "multiple-dry" years. This is consistent with IRWD's 2010 UWMP and historical regional demand variation as documented in MWD's Integrated Regional Plan (1996) (Volume 1, page 2-10). This increase in estimated demands is also consistent with MWDOC's 2015 UWMP which assumes increased demands in single dry and multiple dry years of 6% based on MWDOC's OC Reliability Study (MWDOC 2015 UWMP).

The following DWR Tables 7-3 and 7-4 show IRWD's estimated single dry and multiple dry year supplies and demands for the 20 year planning horizon. These projections reflect IRWD's estimated 7% increase in demands under these hydrologic conditions.

DWR Table 7-3: Single Dry Year Supply and Demand Comparison

	2020	2025	2030	2035
Supply totals	142,197	154,549	154,549	154,549
Demand totals	103,195	113,378	117,091	119,066
Difference	39,002	41,171	37,458	35,483

DWR Table 7-4: Multiple Dry Years Supply and Demand Comparison

		2020	2025	2030	2035
First year	Supply totals	142,197	154,549	154,549	154,549
	Demand totals	103,195	113,378	117,091	119,066
	Difference	39,002	41,171	37,458	35,483
Second year	Supply totals	142,197	154,549	154,549	154,549
	Demand totals	103,195	113,378	117,091	119,066
	Difference	39,002	41,171	37,458	35,483
Third year	Supply totals	142,197	154,549	154,549	154,549
	Demand totals	103,195	113,378	117,091	119,066
	Difference	39,002	41,171	37,458	35,483

The resulting difference in IRWD's supply and demand comparisons as shown in DWR Tables 7-2, 7-3, and 7-4 show quantities of "reserve" water supplies (excess of supplies over demands). These excess supplies are expected to be available for IRWD to serve as a buffer against inaccuracies in demand projections, future changed in land use, or alterations in supply availability.

7.3 Regional Supply Reliability

Imported Water

MWD, the regional wholesale agency, manages the imported water supplies delivered to IRWD. MWD's policies and practices that maximize the efficient use of supplies are addressed in MWD's 2015 UWMP update. The details of the regional coordination and operation of the water supply during a drought are included in both MWD's and MWDOC's 2015 UWMPs. MWD's policies and practices that maximize the efficient use of supplies are addressed in MWD's 2015 UWMP and its Integrated Resource Plan (IRP) Update in 2015, and the Water Surplus and Drought Management Plan (WSDM). MWD's UWMP summarizes these efforts and provides information concerning the availability of the supplies to its entire service area.

In 1996, MWD completed its IRP to establish regional targets for the development of water resources and a preferred resource mix which would ensure MWD would meet the region's present and future needs for dependable supplies without interruption through 2025. In 2004 MWD completed an IRP Update with three objectives 1) to review the goals and achievements of the 1996 IRP, 2) to identify changed conditions for water resource development and 3) to update the resource targets through 2025. It calls for investments in water conservation,

recycled, groundwater treatment, storage and water transfers to enhance supply reliability, flexibility and diversity.

In the 2015 IRP Update, MWD identified changes to the long-term plan and established direction to address the range of potential changes in water supply planning. The IRP also discusses dealing with uncertainties related to impacts of climate change, as well as actions to protect endangered fisheries. The Findings and Conclusions in the MWD 2015 IRP Update state that MWD's reliability goal that full-service demands at the retail level will be satisfied for all foreseeable hydrologic conditions remains unchanged. MWD will accomplish this through its core resources strategies. The 2015 IRP Update emphasizes an evolving approach and suite of actions to address the water supply challenges that are posed by uncertain weather patterns, regulatory and environmental restrictions, water quality impacts and changes in the state and the region. MWD's Adaptive Resource Management Strategy includes three components: Core Resources Strategy, Supply Buffer Implementation and Foundational Actions which together provides the basis for the 2015 IRP Update. The 2015 IRP Update expands the concept of developing a planning buffer from the 2004 IRP Update by implementing a supply buffer equal to 10 percent of the total retail demand. MWD will collaborate with its member agencies to implement this buffer through compliance with Senate Bill 7 which calls for the state to reduce per capita water use 20 percent by the year 2020.

Estimates of demands on MWD for the 2015 UWMP were derived by first estimating the total retail demands for the region and then factoring in impacts of conservation. MWD also uses projections of local supplies and expected local supply programs to arrive at its total demands. MWD estimates demands for single dry year, multiple dry years and average years. MWD's 2015 UWMP and IRP Update summarizes the reliability analyses which demonstrate that MWD can maintain reliable supplies under conditions that have existed in past dry periods throughout the period 2015 through 2035.

MWD performs water shortage planning in its WSDM Plan which guides MWD's planning and operations during both shortage and surplus conditions. Furthermore, MWD developed the Water Supply Allocation Plan (WSAP) (February 2009, updated December 2014) which provides a standardized methodology for allocation of MWD's supplies during times of shortage. The WSDM Plan distinguishes between shortages, severe shortages and extreme shortages. These terms have specific meanings relating to MWD's ability to deliver water and the actions it takes. In June 2008, MWD's Board adopted a Water Supply Condition Framework to communicate the urgency of the region's water supply situation and the need for further water conservation to reduce regional demands, MWD uses the WSDM Plan and Framework to determine if a WSAP is recommended.

On April 14, 2015, MWD approved the implementation of its WSAP at a level 3 Regional Shortage Level and an effective 15% reduction in regional deliveries effective July 1, 2015, through June 30, 2016. As a result of IRWD's diversified water supplies, IRWD is only reliant on MWD for about 20% of its total supplies. As discussed in Chapter 6 "Exchanges or Transfers", in 2014, IRWD and MWD entered into an agreement for transferring some of IRWD's banked water into IRWD's service area. In 2015 just prior to MWD's effective WSAP date, IRWD recovered and delivered 1,000 AF of its non-SWP water to its service area which

was used as extraordinary supply to supplement reduced imported supplies during MWD's WSAP. IRWD made use of this water starting July 1, 2015 through February 2016.

Generally, under shortage scenarios, IRWD may need to supplement supplies with production of groundwater, which can exceed the applicable basin production percentage on a short-term basis, providing additional reliability during dry years or emergencies. In addition, IRWD can also recovery and deliver supplemental water stored in its water banking projects in Kern County, California, to IRWD's service area under a short-term MWD allocation. IRWD may also convert non-potable demands served by potable water to recycled water as a way to conserve potable water.

Groundwater Supply

As discussed in Chapter 6, OCWD's planning documents examine future Basin conditions and capabilities, water supply and demand, and identified projects to meet increased replenishment needs of the Basin. With the implementation of OCWD's preferred projects in its Long Term Facilities Plan, OCWD expects the Basin yield in the year 2035 to be increased. The amount that can be produced will be a function of which projects will be implemented by OCWD and how much increased recharge capacity is created by those projects, total demands by all producers, and the resulting basin pumping percentage that OCWD sets based on these factors. (see also Chapter 6).

Replenishment supplies for the Basin include capture of increasing Santa Ana River flows, purified recycled water, purchases of replenishment water from MWD, and expansion of local supplies. OCWD's Groundwater Replenishment System (GWRS) is OCWD's recycled water purification system that has been in operation since 2008. Wastewater is purified using a three-step process to produce high-quality water used to recharge the Basin and for injection into the seawater intrusion barrier. The GWRS was expanded in 2015 from 72,000 AF per year to 100,000 AF per year.

OCWD is required annually to investigate the condition of the Basin, assess overdraft and accumulated overdraft, and determine the amount of water necessary for replenishment. The Basin is managed to allow utilization of up to 500,000 AF of storage capacity of the basin during dry periods, acting as an underground reservoir and buffer against drought. OCWD operates the basin to keep the target dewatered basin storage at 200,000 AF as an appropriate accumulated overdraft. Overdraft varies over time as the Basin is managed to keep it in balance over the long term. Within the Basin, production of groundwater can exceed applicable basin production percentages on a short-term basis, providing additional reliability during dry years or emergencies.

Non-Potable Water Management

Recycled water has proven to be an effective "drought-proof" reliable supply as a result of the fact that sewage flows remain virtually unaffected by dry years. As mentioned, IRWD expanded the MWRP in 2014, to provide additional recycled water as demands and sewage flows increase in the future.

As with the potable system, having several sources of supply provides reliability in the recycled water system. Those sources include recycled water from the MWRP and LAWRP, untreated water from MWD, local runoff and some local groundwater. Reliability is further enhanced by seasonal storage capacity in Rattlesnake Reservoir, Sand Canyon Reservoir, San Joaquin Reservoir, Syphon Reservoir, and Irvine Lake.

Currently only a small portion of IRWD's non-potable supply, native water captured in Irvine Lake, is reduced in single-dry and multiple-dry years. Given the dependence of native water on rainfall for Irvine Lake, for purposes of water supply reliability, only a small portion of IRWD's share of 28,000 AFY of native water rights (4,000 AFY in normal years and 1,000 AFY in dry years) is shown in available supplies, based on averaging of historical data. As discussed in Chapter 6, IRWD is currently constructing the Baker Water Treatment Plant (WTP), a joint regional project with four other south Orange County water districts (El Toro Water District, Moulton Niguel Water District, Santa Margarita Water District and Trabuco Canyon Water District). The project will provide increased water supply reliability by increasing local treatment capability from multiple water supply sources including imported untreated water from MWD and through the local surface water in Irvine Lake. The Baker WTP is expected to be online in fall 2016, and therefore all Irvine Lake surface water will be treated for potable use and will no longer be a supplemental recycled water supply.

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8. WATER SHORTAGE CONTINGENCY PLANNING

Law

10632(a) The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

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.

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 sequence for the agency's water supply.

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.

10632(a)(4) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

10632(a)(5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

10632(a)(6) Penalties or charges for excessive use, where applicable.

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 suppliers, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

10632(a)(8) A draft water shortage contingency resolution or ordinance.

10632(a)(9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

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.

8.1 Stages of Action

IRWD's response to inadequate water supply varies depending on the magnitude and duration of the shortfall. In the event of a water shortage situation, IRWD would rely on its Water Shortage Contingency Plan (WSCP), which was most recently revised and adopted in October 2014, and is included in Appendix G. IRWD is currently preparing an updated WSCP, which is anticipated to be completed in 2016.
The WSCP provides guidelines for responses to varying levels of supply shortages ranging from Level 1 to Level 4, as shown in the following DWR Table 8-1. The WSCP includes actions that can be implemented to reduce demands down to specific levels in accordance with reduced supply availability. The stages of action identified in the WSCP have been included in IRWD's Rules and Regulations (Section 15) which states,

> *"The measures may be applied individually or in combination and may vary according to the severity and duration of the shortage. Other measures may be applied in lieu of or in addition to those described in the WSCP."*

Stages of the WSCP are enacted at the direction of IRWD's Board of Directors depending on the level and duration of the water shortage. The Board evaluates water supply conditions and, if it determines that a shortage exists, declares the corresponding level of the WSCP. As part of the declaration, it is at the discretion of the Board to implement specific water shortage restrictions, prohibitions, and demand management measures. In addition, the WSCP also contains basic measures that are always in effect, which are considered by IRWD to be good water management practices. These basic measures are also defined in IRWD's Rules and Regulations (Section 15). Additional details corresponding to each of the Levels are provided in the following paragraphs.

Basic Measures Always in Effect

There are five basic measures that are always in effect in IRWD's service area, which are listed below:

- Inform the public consciousness in order to help reduce water demand
- Prevention of irrigation run-off and water waste
- Leak prevention
- Ban on washing down hard or paved surfaces, except when necessary to alleviate safety or sanitary hazards
- Ban on wasting water

In addition, IRWD has a budget-based rate structure that is based on the cost of service, which also limits the amount of water allocated to each customer to an amount that is reasonable for the customer's needs and property characteristics, reducing wasteful use of water.

Level 1: Shortage Warning

Level 1 is a shortage warning and low-level shortage condition intended to address supply reductions of up to 10%. Measures selected under this level would be designed to achieve the following objectives:

- Increase public awareness of water supply situation and conservation opportunities
- Encourage diligent repair of water leaks
- Reduce over-budget water use
- Reduce outdoor over-irrigation

The measures used in Level 1 are primarily voluntary actions that modify customer behavior resulting from an enhanced public awareness campaign. In addition, increased outreach is targeted toward customers that use water in excess of water budget amounts, to help them identify the source of their overuse, and correct the problem should be sufficient to meet the objectives in Level 1.

Level 2: Significant Shortage Condition

Level 2 is a significant shortage condition intended to address supply shortages between 10-25%. Measures selected under Level 2 would be designed to incorporate the objectives listed under Level 1, and achieve the following further reductions in use:

- Review of water budgets and potential adjustments to reduce outdoor irrigation and agricultural uses by 30%, or a percentage to be specified in the shortage declaration, based on a supply and demand analysis
- Discourage filling of fountains, pools, and water features and other discretionary uses

The use of water budgets and tier threshold adjustments is expected to be sufficient to achieve the necessary demand reduction objectives in a Level 2 shortage. Adjustments to the water budgets would employ the demand management/water budget adjustment strategies described in detail in Appendix G.

Level 3: Severe Shortage Condition

Level 3 is a severe shortage condition intended to address supply shortages ranging from 25-40%. Measures selected under Level 3 would be designed to incorporate the objectives listed under Level 2, and achieve the following further reduction in use:

- Further reductions in and/or eliminations of non-essential uses
- Further reduce outdoor irrigation and agricultural uses by 60% or a percentage to be specified in the shortage declaration, based on analysis of supply and demand
- Reduction in CII use by 10%, or a percentage to be specified in the shortage declaration, based on an analysis of supply and demand
- Elimination of specific municipal uses such as street cleaning, hydrant flushing, water-

based recreation, etc.

- Activation of an IRWD Task Force to investigate and consult with high-volume users (i.e. public authorities, universities, community associations, etc.) to assist in reducing the water demands of their properties

Level 4: Crisis Shortage Condition

Level 4 is a crisis shortage condition occurring when supply shortages exceed 40%; this level would address a 50% reduction in water supply. Measures selected would be designed to incorporate the objectives under Level 3, and achieve the following further reductions in use:

- Cease all outdoor water uses for landscape and agriculture, subject to reserved rights relating to local wells

A Level 4 shortage would likely require further adjustments to water budgets and the use of all Demand Management/Budget-Based Rates strategies described in Part II of the WSCP at the discretion of the Board. In addition, the Board may determine that it is necessary to use mandatory restrictions and possible discontinuation of non-health and safety related service in order to achieve the necessary demand reductions in a Level 4 shortage.

DWR Table 8-1: Stages of Water Shortage Contingency Plan

Stage	Complete Both	
	Percent Supply Reduction[1] *Numerical value as a percent*	Water Supply Condition (*Narrative description*)
Add additional rows as needed		
1	Up to 10%	Level 1: Shortage warning/low level shortage
2	10-25%	Level 2: Significant shortage condition
3	25-40%	Level 3: Severe shortage condition
4	Greater than 40%	Level 4: Crisis shortage condition
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		
NOTES: Stage 4 covers a water shortage condition of 50%		

8.2 Recent Enactment of IRWD's WSCP

As a result of low precipitation levels in California since 2012, on January 17, 2014 the Governor proclaimed a Drought State of Emergency, which, among other things asked all Californians to reduce water consumption by 20%. In September 2014 IRWD's Board responded to the drought and the Governor's State of Emergency by declaring a Level 1 Shortage Warning. In response to worsening drought conditions, on April 1, 2015 the Governor issued an Executive Order that mandated a 25% statewide reduction in urban potable water use compared to 2013 water use levels. For IRWD, the State Water Resources Control Board (State Board) mandated a water use reduction target of 16% compared to 2013 levels, entering into effect on May 5, 2015. In July 2015, IRWD's Board of Directors Adopted Resolution No. 2015-18, provided in Appendix H, declaring a Level 2 Shortage Condition aimed at reducing demands by 10-25% in response to the State Board's mandate.

The Level 2 Shortage Condition incorporated all of the basic measures that are always in effect, Level 1 measures, and Level 2 measures. The specific Level 2 response measures that went into effect in July 2015 include:

- Customers shall reduce potable landscape watering by up to 50 percent;
- Swimming pools shall be filled to a lower level to minimize water loss due to splashing.
- Discretionary maintenance requiring refilling of swimming pools shall be prohibited. Filling newly constructed pools and refilling pools for required, non-discretionary maintenance is not subject to the ban;
- Commercial conveyor and in-bay car wash systems must reuse water if equipped to do so;
- Recycled water shall be required for construction activities, including earthwork, dust control and clean-up. IRWD may, at its discretion, waive this requirement if it can be demonstrated to IRWD's satisfaction that compliance with the requirement imposes undue hardship;
- The use of recycled water is required for street sweeping activities. IRWD may, at its discretion, waive this requirement if it can be demonstrated to IRWD's satisfaction that compliance with the requirement imposes undue hardship;
- Common interest associations shall not fine or assess owners of separate interests for reducing or eliminating the watering of vegetation or lawns, unless the association uses only recycled water for irrigation of the association's common areas and recycled water is also available at the irrigated area of the separate interest; and
- IRWD, by separate action, shall implement demand management measures through adjustments in the budget-based pricing structure (on June 22, 2015, the Board adopted No. 2015-17 implementing such adjustments).

8.3 Catastrophic Supply Interruption Plan

IRWD's response to a catastrophic interruption of water supply would depend on the cause, severity and anticipated duration of the emergency. Any potential shortage resulting in a reduction of available supplies can be addressed through a combination of alternative supplies

and storage. Since IRWD's major potable water sources include both imported water (including IRWD's groundwater banking) and local groundwater, it is unlikely that both sources would be out simultaneously.

Since IRWD does not operate a regulating reservoir to meet seasonal variations in water demand, IRWD's policy is to supply the maximum daily potable demand, thus meeting the worst case demand scenario. Daily fluctuations are met by local storage within the distribution system.

Interruption in Imported Supplies

Interruption in source water deliveries to IRWD could occur as a result of a planned outage or emergency source outage. To plan for an outage, MWD member agencies reference the planning criteria from MWD's Administrative Code for member agency outage. As part of planning for an outage, each member agency including the MWDOC, IRWD's MWD-member agency, should have a seven-day supply of water in case of an interruption of MWD deliveries.

IRWD is currently completing an updated system reliability study. The intent of the updated water reliability study is to assist IRWD in defining appropriate levels of potable water reliability under different water supply and demand scenarios. The study includes an analysis of how imported water supply shortages, climate change, facilities constraints and outages, and emergencies could affect IRWD's ability to deliver water to its customers. Once completed, information from the reliability study will be used to inform IRWD's 2016 update to its WSCP.

Water Banking

IRWD's water resources reliability program relies on diversifying water supplies which includes the development of water banking facilities to provide a contingency, supplemental supply for extended drought or supply interruptions when imported supplies may be restricted. As described more fully in Section 6.7, IRWD has constructed a fully operational water banking program that makes it possible for IRWD and its banking partners to store excess water during "wet" hydrologic periods. The stored water is then available for use during "dry" periods to offset reduced water supplies under periods of severe drought or during periods of supply interruptions.

In 2015, IRWD was able to demonstrate the reliability benefits of its water banking program as discussed in Chapter 6 under "Imported Water Management". On April 14, 2015, MWD approved the implementation of its WSAP at a level 3 Regional Shortage Level and an effective 15% reduction in regional deliveries effective July 1, 2015, through June 30, 2016. Prior to the WSAP implementation, in 2014, IRWD and MWD entered into an agreement for transferring some of IRWD's banked water into IRWD's service area. IRWD was able to recover and deliver 1,000 AF of its non-SWP water to its service area which was used as extraordinary supply to supplement reduced imported supplies during MWD's WSAP. IRWD made use of this water starting July 1, 2015 through February 2016. As of June 30, 2015, IRWD has approximately 22,000 AF of water in storage through its water banking program.

Baker Water Treatment Plant

The 28.1 mgd Baker Water Treatment Plant is a joint regional project by five South Orange County water districts, including IRWD. The project will provide increased reliability by increasing local treatment capacity and providing the opportunity to treat local raw water from Irvine Lake. The project will mitigate potential impacts from MWD's extended shutdowns of treatment plants or treated water delivery lines.

Service Area Interties

IRWD has existing interties between its Lake Forest service area and its main service area, which provide a positive service delivery benefit by increasing the sources of supply of water and the opportunities to share and expand the use of recycled water. The interties provide expanded opportunities to increase regional facility operational efficiency and reliability by opening existing "emergency" interconnections on a regular basis to increase access to water supply and allocating reservoir storage to support all systems, thereby allowing flexibility of water operations and reducing the need for redundant storage capacity.

On an inter-county basis, IRWD has emergency water interconnections with several neighboring water suppliers providing a means to exchange and transfer water between agencies. Currently, IRWD has 23 interconnections: four with City of Newport Beach; one with East Orange County Water District; two with Santa Margarita Water District; one with Trabuco Canyon Water District; one with the City of Tustin; four with Mesa Consolidated Water District; six with the City of Orange; one with the City of Costa Mesa; and three with El Toro Water District.

IRWD is also a member of the Water Emergency Response Organization of Orange County (WEROC) and the State Emergency Management System (SEMS). IRWD personnel have been cross-trained in emergency planning for water, wastewater and recycled water systems. In the potable water system, there will be access to multiple sources of supply and storage facilities. Existing "emergency" interconnections can be opened to regular service, which will increase access and reliability of water supply. Reservoir storage can be allocated to cross support all systems, which will increase reliability and flexibility of water operations and reduce the need for redundant storage capacity.

IRWD plans for and responds to emergency incidents, including power outage, earthquakes, fires, floods and hazardous materials incidents. IRWD Table 5 below provides a summary of actions in response to possible catastrophes, which are intended to minimize the impacts of a water supply interruption on IRWD's service area.

IRWD Table 5: Preparation Actions for a Catastrophe

Possible Catastrophe	Summary of Actions
Regional power outage	Request information from So. Cal Edison on estimated down time; if backup generation is available assess ability to supply fuel for extended periods; estimate potable water requirements under emergency condition and determine if needs can be met; increase disinfectant residual as a precaution of potential contamination; notify affected users; issue "Boil Water" or "Do Not Drink" orders as needed; initiate back up portable pumping equipment as needed to serve areas of limited storage. Notify customers, media, state and local authorities if service is disrupted or significant demand management is necessary.
Earthquake	Activate Emergency Operations Center (EOC); Contact emergency assistance (local police, local fire) as necessary; notify customers, media, state and local authorities if service is disrupted or significant demand management is necessary; contact neighboring water agencies for mutual aid arrangements and open connections if needed. Issue "Boil Water" or "Do Not Drink" orders as needed.
Flood	Contact local representative of National Weather Service for information on exact location and probable extent (stage) of flooding relative to utility facilities. Activate EOC; elevate in-place or remove water-sensitive equipment; assemble mobile stand-by generators and auxiliary water pumps; install sewer backflow valves; notify neighboring utilities of emergency response support if help needed; notify customers, media, city and other authorities that service may be disrupted or that demand reductions may be necessary.
Water Supply Interruption	Depending on the percentage of water reduction needed after accounting for potential mitigation from the Baker Water Treatment Plant (i.e. 5% to 50%) IRWD will institute its water prohibitions within its water shortage contingency plan. Take action to provide alternate drinking water supply and fire protection, including local interconnections with neighboring sources, area water haulers, temporary storage options, etc. Chlorine residuals increased temporarily as needed. Valve off portions of the distribution system until above ground storage tanks are refilled. Issue "Boil Water" or "Do Not Drink" orders as needed.
Structural damage from explosive device	Perform damage assessment, determine how damage affects the system; isolate damaged area from rest of system and take measures to bypass damaged area. Based on extent of damage consider alternative treatment schemes if necessary. Physically secure system and implement security procedures throughout the system. Notify local law enforcement and Department of Health Services (DHS). Issue "Boil Water" or "Do Not Drink" orders as needed.
Threat of or possible contamination to water system	Notify local law enforcement and DHS; take actions to isolate portions of system containing suspect water; issue "Boil Water" or "Do Not Drink" orders as needed; take action to provide alternate drinking water supply and fire protection.

8.4 Mandatory Prohibitions

Certain prohibitions contained in IRWD's Rules and Regulations (Section 15) are in effect at all times regardless of whether any declared shortage condition is in effect. IRWD further defines mandatory restrictions and prohibitions in its WSCP based on declared water shortage level as indicated in the following DWR Table 8-2.

DWR Table 8-2: Restrictions and Prohibitions on End Uses

Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
Ongoing	Other	Gutter flooding - No water shall be allowed to run or escape from property if it can be prevented	Yes
Ongoing	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	No person shall permit leaks of water that he has the authority to eliminate	Yes
Ongoing	Other - Prohibit use of potable water for washing hard surfaces	Including by not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys	Yes
Ongoing	Other	No person shall cause or permit water under his control to be wasted	Yes
Ongoing	Other	Potable water shall not be used for single-pass cooling	Yes
Ongoing	Water Features - Restrict water use for decorative water features, such as fountains	Non-recirculating fountains and water features using potable water shall not be used	Yes
1	Other	No person shall use a hose to wash a motor vehicle, except when the hose is fitted with a shut-off nozzle	Yes
2	Other water feature or swimming pool restriction	No person shall drain and re-fill a pool for discretionary maintenance that can be deferred	Yes
2	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner	Each customer shall survey plumbing every two months and eliminate water loss resulting from leaky plumbing fixtures	Yes
2	Other	Each person is encouraged to restrict showers to five minutes or less; fill the bath tub no more than one-quarter full	Yes
2	Other	Customers are encouraged to refrain from running water unnecessarily	Yes
2	Other	Customers are encouraged to run only full loads of laundry and dishes	Yes
2	Landscape - Prohibit certain types of landscape irrigation	Customers shall reduce potable landscape watering by up to 50%.	Yes
2	Other water feature or swimming pool restriction	Customers shall fill swimming pools to a lower level to minimize water loss due to splashing	Yes

Stage	Restrictions and Prohibitions on End Users	Additional Explanation or Reference	Penalty, Charge, or Other Enforcement?
2	Other	Commercial conveyor and in-bay car wash systems must reuse water if equipped to do so, and shall repair and maintain the equipment in a manner that allows for the operation of the reuse system	Yes
2	Other	The use of recycled water shall be required for construction activities	Yes
2	Other	The use of recycled water is required for street sweeping activities	Yes
2	Other	No fines will be assessed by common interest developments associations for reducing or eliminating the watering of vegetation or lawns with potable water	Yes
4	Landscape - Prohibit all landscape irrigation	Ban outdoor irrigation with potable supplies	Yes
4	Other	Ban on car-washing	Yes
4	Other water feature or swimming pool restriction	Ban pool filling	Yes

8.5 Consumption Reduction Methods

IRWD recognizes that it is best to caution of a water shortage as early as possible, at a minimal level, to encourage voluntary rationing and to gain public support and participation, and reduce the likelihood of more severe shortage levels later. Responses to water shortages must be made early on to prevent severe rationing and economic impacts. An example of how IRWD responds to water shortage conditions is provided above in the section titled, "Recent Enactment of IRWD's WSCP."

IRWD would employ a range of measures in response to potential shortages depending on the level and duration. While the measures will be applied incrementally, IRWD's WSCP builds in a level of flexibility to adopt additional measures to ensure the appropriate level of demand reduction. Under IRWD's budget-based conservation rate structure that is always in effect, customer water budgets are limited to the amount that is reasonable for the customer's needs and property characteristics, and reflect the exclusion of these types of wasteful water uses.

The use of IRWD's budget-based rates and the assessment of higher rates for over-budget or wasteful use provides IRWD with an additional strategy to help achieve demand reductions. In order to achieve the necessary demand reductions, IRWD's measures will progress from voluntary reductions to reduction of discretionary uses through financial incentives or restrictions to reduction of non-discretionary uses through financial incentives or restrictions based on the level of the shortage. Most shortages, unless extreme (Level 4 or system outage),

can be addressed with a combination of voluntary measures and a reduction of discretionary uses through financial incentives.

It should be noted that IRWD has implemented on-going water use efficiency and outreach programs since the early 1990's, and those efforts combined with the budget-based tiered rates, have resulted in somewhat hardened levels of demand. IRWD will employ additional strategies, discussed in detail in the WSCP, to achieve the necessary demand reductions in a shortage situation.

An excess use charge based upon the budget-based rate structure is sufficient to encourage demand reduction to required levels. IRWD also has the ability to establish restrictions on water use or to discontinue service in the case of repeat violators under the Water Code of the State of California.

It should be noted that the majority of IRWD's landscape accounts are served with recycled water, which is considered to be drought tolerant supply. Therefore, if no shortage of recycled water supplies exists, consumption reductions may only apply to potable water accounts and raw water accounts (mostly agricultural) since these may be dependent on imported non-potable supplies which would most likely be reduced in a drought.

Through the adopted resolutions, IRWD has provisions for consumption reduction methods to be implemented if necessary based on the water shortage level declared. The consumption reduction measures used by IRWD and included in the WSCP are summarized in the following DWR Table 8-3.

DWR Table 8-3: Stages of WSCP – Consumption Reduction Methods

Stage	Consumption Reduction Methods by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	Additional Explanation or Reference *(optional)*
Add additional rows as needed		
Ongoing	Provide Rebates on Plumbing Fixtures and Devices	As available
Ongoing	Provide Rebates for Landscape Irrigation Efficiency	As available
Ongoing	Provide Rebates for Turf Replacement	As available
1	Expand Public Information Campaign	General conservation efforts including dedicated pages on IRWD's website, information provided in the Pipelines customer newsletter, and drought-related presentations to groups such as city council, community associations, chambers of commerce, business groups, and schools
1	Offer Water Use Surveys	Target over-allocation customers for surveys/assistance
1 or 2	Implement or Modify Drought Rate Structure or Surcharge	Review and adjust customer allocations and/or billing tiers as necessary
2	Other	Reduce potable and untreated irrigation and ag allocations by 30% or other percentage to be specified
3	Other	Reduce potable and untreated irrigation and ag allocations by 60% or other percentage to be specified
3	Other	Reduce CII allocations by 10% or other percentage to be specified
3	Decrease Line Flushing	Elimination of specific municipal uses such as hydrant flushing
3	Other	Elimination of specific municipal uses such as street cleaning and water-based recreation
3 or 4	Implement or Modify Drought Rate Structure or Surcharge	Increase rates for over-allocation tiers
4	Implement or Modify Drought Rate Structure or Surcharge	Further rate increase to achieve necessary reduction
4	Other	Further reduction of allocations and tightening of tiers and to achieve necessary reduction
4	Other	Eliminate non-recycled water outdoor use (100% reduction)
4	Other	Ban on car washing and pool-filling
4	Other	Mandatory restrictions and enforcement, as necessary

Extreme Shortage Measures

A Level 4 shortage of up to 50%, would require further adjustments to billing water budgets and the use of all the Demand Management/Budget-Based Rates strategies described in the WSCP. In addition, IRWD may determine that it is necessary to use mandatory restrictions and possible discontinuation of non-health and safety related service in order to achieve the necessary demand reductions in a Level 4 shortage. In addition to the measures implemented in all prior stages, IRWD may impose any combination of the following mandatory measures and rationing to alleviate demands. Additional detail is provided in the WSCP (refer to Appendix G).

1. *Potable Irrigation Ban*: Outdoor irrigation would be the initial target for any demand reductions. Demand reductions or eliminations that cannot be met through voluntary measures and financial incentives related to adjustments in the budget based rate structure, would be attained through a ban on potable irrigation.

2. *Ban on car-washing and pool-filling:* Demand reductions on car-washing and pool filling that cannot be achieved through voluntary measures and financial incentives related to adjustments in the budget-based rate structure would be attained through a ban on these actions.

3. *Flow restrictors:* Under extreme conditions of noncompliance, IRWD could install flow restrictors in individual service lines. Thus, water would be available for drinking, cooking, sponge baths, and slow fill of toilet tanks, but showers and other high volume type uses would not be possible. Under these conditions individual customer reaction would be severe. It would probably be necessary to augment the customer service field service staff to maintain surveillance of these services to assure that unauthorized changes are not made by the customer.
4. *Mandatory Restrictions and Fines:* IRWD's ability to establish restrictions on water use and to possibly discontinue non-health and safety related service in the case of repeat violators is provided for under the Water Code of the State of California Chapters 3 and 3.5).

8.6 Penalties for Excessive Use

IRWD's Rules and Regulations (Section 15) provide for enforcement and penalties that may apply to violators during a water shortage. An excess use charge based upon the budget-based rate structure, which is always in effect, is sufficient to encourage demand reduction to required levels. Depending on the level of shortage, IRWD may reduce customer billing water budgets, tighten the tiers, increase rates, or some combination of those strategies to obtain the necessary reductions. IRWD also has the ability to establish restrictions on water use or to discontinue service in the case of repeat violators under the Water Code of the State of California. Penalties for IRWD are identified based on the shortage conditions in the following IRWD Table 6.

IRWD Table 6: WSCP – Penalties and Charges

Penalties or Charges	Stage When Penalty Takes Effect
Penalty for excess use	4
Charge for excess use (over-budget billing tiers)	Always in Effect
Installation of flow restrictor	Extreme noncompliance

8.7 Analysis of Impacts on Revenue and Expenditures

The California Code Section 10632(a)(7) requires an analysis of the impacts of each of the actions taken for conservation and water restriction on the revenues and expenditures of the water supplier. IRWD's WSCP does not provide a detailed analysis of revenue and expenditure impacts of water shortages because IRWD's billing structure is designed to be insulated from revenue swings resulting from deviations between actual and budgeted water sales and from declining or reduced water sales. IRWD's billing structure consists of a fixed meter charge and a commodity charge based on the number of units of water used. Meter charges are set to meet IRWD's fixed costs of operation (e.g. salaries, supplies, etc.). The base commodity charge is set to match the cost of producing and purchasing water. Therefore, IRWD can recover its fixed costs regardless of the quantity of water sold, whereas the water sales at any level will cover the costs of providing water. This system has proven to be effective in balancing revenue and expenditures. The following IRWD Tables 7 and 8 show components of revenue and expenditure impacts that have been evaluated by IRWD and found no impact on IRWD revenues and expenditures.

IRWD Table 7: Actions and Conditions the Impact Expenditures

Type	Anticipated Revenue Reduction
Reduced sales	No Impact
Development of reserves	No Impact
Impact of supplier's higher rates (Tier 2)	No Impact
Category	**Anticipated Cost**
Change in quantity of sales	No Impact
Increased staff salaries/overtime	No Impact
Increased costs of new supplies/transfers/exchanges	No Impact

IRWD Table 8: Proposed Measures to Overcome Revenue Impacts

Names of Measures	Summary of Effects
Review of rate adjustment	IRWD can revise its rate structure during water shortage stages which can increase commodity sale revenues if needed to offset MWD shortage tier rates.
Reserves	IRWD maintains reserves that can stabilize water rates during times of reduced water sales
Reduce overhead or decreased capital expenditures	If necessary, IRWD can reduce overhead and postpone capital expenditures

Pricing Policy

IRWD's pricing policy is based on the cost of service, but also discourages wasteful uses of water. The pricing policy is evaluated on a yearly basis and adjusted as warranted. The Budget-Based Rate Structure developed by IRWD is intended to ensure that the cost of water is based on how much water customers use, and whether customers stay within their monthly water budget, but also functions as a tool to promote water use efficiency commensurate with water supply conditions and is supported by cost of service. The structure includes a four-tiered system for residential customers and a two-tiered system for nonresidential customers, and charges progressively higher rates for progressively higher amounts of water used. Usage blocks for residential customers are based upon the type of dwelling and irrigated landscape. Landscape irrigation water budgets are based on site acreage and actual weather data.

The pricing policy for potable, non-agricultural use consists of three charges:

(1) Monthly service charge
(2) Commodity charge
(3) Pumping Surcharge

The monthly service charge varies with the size of the water meter connection. This charge is intended to recover the operating and maintenance costs incurred. The variable ascending commodity charge recovers the cost of purchased and pumped water. This structure establishes an increasing unit cost per 100 cubic feet of water, as described in the next section. The pumping surcharge is added to the commodity rate of those users who reside at higher elevation areas. The surcharge is based on prevailing energy costs.

In an effort to promote water conservation, IRWD all customer types and sources of water are billed using budget based rates. The untreated water pricing for agricultural customers does not include a service charge, only a commodity charge to recover the cost of water purchases, although a service charge is assessed for non-agricultural untreated water customers. The recycled water pricing policy for customers includes a monthly service charge identical to the potable system and a lower commodity rate based on a lower cost of service. Moreover, as an incentive to reduce water consumption, IRWD provides a reduced sewer service charge for residential customers who use less domestic water.

IRWD prepares monthly reports, which outline water use by customer type. These reports are used to evaluate water use trends and track conservation efforts.

8.8 Mechanism for Determining Actual Reductions in Water Use

IRWD is fully metered allowing for detailed accounting of water use in the service area. Monthly meter reads provide IRWD with a significant quantity of data for tracking and reporting actual reductions in water use in response to a water shortage. For example, in response to the current drought, IRWD has implemented water budgets designed to achieve the necessary reductions in water use. Each month IRWD determines how much water each customer has used in relation to their budget. This comparison is used to track attainment of water use reduction goals for the agency and is included in the customer's bill to encourage compliance with the water budgets.

8.9 Water Shortage Contingency Resolution

In October 2014, the IRWD Board adopted Resolution No. 2014-46 approving an amended WSCP. A copy of the Resolution is included in Appendix H. IRWD is currently in the process of updating the amended 2014 WSCP; a comprehensive update to the WSCP is anticipated to be completed in 2016.

8.10 Minimum Supply Next Three Years

The UWMP Act requires quantification of the minimum water supply available during the next three years (2016 to 2018) based on the driest three-year historic sequence for IRWD's water supply. For IRWD's supplies, the driest three-year historic sequence is based on MWD's Regional UWMP historic sequence (1990-1992). DWR Table 8-4 shows IRWD's expected minimum supply during the next three years.

DWR Table 8-4: Minimum Supply Next Three Years

	2016	2017	2018
Available Water Supply	91,100	91,100	91,100

8.11 Features Artificially Supplied with Water

IRWD adopted a resolution in 2014 adopting the current water shortage contingency plan, which bans non-circulating systems in water features and regulates water use in swimming pools.

9. DEMAND MANAGEMENT MEASURES

Law

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

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

(B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures: (i) Water waste prevention ordinances; (ii) Metering; (iii) Conservation pricing; (iv) Public education and outreach; (v) Programs to assess and manage distribution system real loss; (vi) Water conservation program coordination and staffing support; (vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.

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 provision 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.

9.1 Demand Management Measure Implementation

Water resource stewardship has been a hallmark of IRWD since its inception. The District set an aggressive tone to promote the efficient use of all water resources beginning in the late 1980's and into the drought of the early 1990's. This effort, which included intensive communication with the various customer groups and some of the first home water audit and ultra-low flush toilet programs in the state, culminated in the adoption of the budget -based rate structure by the IRWD Board in 1991. IRWD's rate structure successfully promotes ongoing conservation and provides the District with revenue stability. It provides a revenue source for IRWD's water use efficiency programs, while providing customers with among the lowest rates in Orange County.

Budget-Based Rate Structure

IRWD's budget-based rate structure was instituted in 1991 to promote the efficient use of water, and is designed to provide customers a significant economic incentive to use the proper amount of water required to serve indoor, landscape, commercial/industrial and institutional demands. This is accomplished by setting a customized monthly water budget for each customer account that is based upon a variety of factors such as: irrigated area, daily weather characteristics, number of residents, industrial or commercial business type, and other more unique

characteristics such as the presence of a pool, livestock or specialized industrial equipment. The bases for the water budgets were reviewed and updated in 2015 to reflect changes in plumbing codes, water use efficiency practices, and the 2015 Emergency Drought Regulation which mandated an aggregate 25% statewide reduction in potable water use from 2013 levels.

Water is sold to customers under a four tier structure based upon their monthly water budget which varies for landscape use relative to weather patterns. Customers using water within budget purchase water in the lower two tiers and are rewarded with very low water bills. Customers using in excess of their budget also purchase water in one to two steeply ascending upper tiers, resulting in relatively high water bills and a strong pricing signal for excessive use. IRWD's 2015 domestic residential commodity rates for each of the four tiers are shown below (IRWD Table 9).

IRWD Table 9: IRWD's 2015 Residential Tiered Rates

Tier	Rate Per CCF	Use (As a Percent of Budget)
Low Volume	$1.11	0-40%
Base Rate	$1.62	41-100%
Inefficient	$3.92	101-130%
Wasteful	$14.53	131% +

Rates Effective July 1, 2015

Revenue Stability

IRWD also assesses a monthly fixed charge based upon meter size. This fixed charge provides adequate funding for all operating costs other than the water commodity itself and the district's water use efficiency and related programs. As such, IRWD enjoys revenue stability regardless of the amount of water sold or the degree of conservation experienced from customers' water use efficiency practices.

Revenue from higher tier, over-allocation water use funds tailored programs and rebates for long-term improvements in water use efficiency and to support IRWD's urban runoff source control and treatment programs. The rate structure is designed to derive sufficient revenues from the over-allocation use tiers to completely fund these programs.

Price Signal to Reduce Water Waste

The rate structure not only signals customers when they are over-using water, but also signals IRWD as to which customers need the greatest degree of attention. This two-way communication helps IRWD focus its financial and staff resources efficiently. Customer service is also emphasized. For example, billing adjustments are provided for customers that have over-allocation use related to leaks if the customer shows evidence of the leak repair. In addition, customers that have habitual over-allocation use are contacted by IRWD staff and offered leak detection services, as well as water use efficiency education and assistance.

Rate Structure Results

Since the introduction of IRWD's allocation-based rate structure in 1991, the following has been observed:

- The rate structure had an immediate effect on the landscape account usage with a 0.5 acre-foot per acre reduction in the first six months following its adoption.
- For landscape accounts, water consumption has dropped 31.5% solely attributable to the rate structure (Kennedy/Jenks 2008). Additional programs and incentives have resulted in a total reduction of 43%, from 4.4 to 2.5 acre-feet per acre since 1991. The associated energy savings with the reduction in imported water requirements is estimated at 1,250 kilowatt hours/acre/year.
- Residential demands have dropped 7% since 1991 as result of the implementation of the allocation-based rate structure (Kennedy/Jenks 2008). The associated energy savings with the reduction in imported water requirements is estimated at 70 kilowatt hours per capita per year.
- Urban runoff (dry weather flow) in the major creek system has only nominally increased, while irrigated acreage has increased over 400%, from 3,300 acres in 1991 to 15,500 acres, presently.
- As a result of the strong economic signal provided with the rate structure and proactive customer outreach, fewer than 3% of residential customers currently pay the highest tier charges in any given month.
- Both residential and non-residential customers give IRWD high marks in customer satisfaction, with customer service rating of "excellent" from 87.1% of surveyed customers.
- The reductions in per capita and landscape water use have reduced IRWD's dependence on expensive imported water.
- Secondary benefits include reductions in urban runoff flows, energy savings and reduced green-house gas (GHG) emissions.

9.2 Water Use Efficiency Programs

IRWD and its customers understand that smart water use needs to be a way of life in Southern California, in wet and drought years alike. We are committed to providing the most cutting-edge water use efficiency programs. Over the decades we've worked to become even wiser about using water. IRWD encourages its customers – as well as its partners, vendors, suppliers, and employees – to use water wisely.

IRWD implements a wide-range of conservation programs, designed to target all customer sectors. Programs are developed to be consistent with the objectives of IRWD's Water Conservation Plan. They are continually evaluated to maximize water savings, and modified to integrate the latest water efficient technologies and practices. Specific programs that IRWD relies upon to meet its demand management, promote water conservation, and to meet its 2020 targets are listed below.

Programs

- Free on-site assistance and customized reports for customers in all sectors to help identify opportunities for water savings, eliminate water waste, and to recommend appropriate programs and strategies to reduce water demands.
- Water Smart Reports that provide enhanced customer engagement through multiple communication methods.
- Turf replacement installation and rebate programs.
- Rebates for weather-based irrigation controllers, drip irrigation and rain barrels.
- Direct installation programs and rebates for high efficiency plumbing devices.
- Rebates for high efficiency clothes washers.
- Rebates for commercial and industrial efficiency devices, such as cooling tower conductivity controllers
- Performance based incentive program for commercial, industrial and institutional (CII) customers to upgrade equipment and improve their water processes to provide greater water use efficiency. High use CII accounts are targeted for participation in the program.
- Fix A Leak courtesy adjustment program.
- Robust system water loss and meter testing programs.

Workshops and Tours

IRWD offers many workshops and tours to its customers as a part of ongoing outreach. We hold monthly workshops targeted toward helping customers reduce outdoor water use and replace turf with drought tolerant plants. Recent efforts have included successful partnerships with U.C. Cooperative Extension and the Master Gardeners to promote landscape water use efficiency.

Public Outreach and Social Media

IRWD's public outreach is aimed at promoting voluntary water conservation, something which IRWD has always done. IRWD's *Always Water SmartRightScape* program is always in effect which focuses on outdoor water efficiency using the Right Plants, Right Equipment and Right Irrigation Schedule. Conservation is a constant ethic and goal, promoted throughout the service area, regardless of drought conditions.

IRWD makes extensive use of its redesigned website www.rightscapenow.com and use of social media, including the use of Facebook and Twitter, to continually remind customers of the conservation message. The website heavily features conservation and easy to use irrigation scheduling guideline, information on tactical incentives, and a new Beautiful Landscapes section which focuses on the three components of a RightScape landscape and water efficient irrigation. IRWD also informs its customers through billing inserts, mailers, water conservation booths, newsletters, postcards, community association meetings, and local public events.

Education Programs

The District has provided free innovative student water education programs since the mid-1970's. These programs are available to students and teachers from kindergarten through college in any public, private or home school within IRWD's service area. From student education programs to resident tours to exciting education partnerships, IRWD's commitment to community education is boundless. Today, through an exciting partnership with the Discovery Science Center, we offer exceptional education programs meeting California curriculum content standards and bringing water education to life for the students in IRWD's service area. IRWD also offers customized programs for high school and college classes highlighting a wide variety of topics related to water and environmental resources.

Strategies to Meet 2020 Target

IRWD has already met and exceeded its 2020 target. IRWD intends to continue its implementation of its effective demand reduction programs as part of its overall long-term water resource strategy.

9.3 California Urban Water Conservation Council Reports

IRWD is a signatory to the Memorandum of Understanding Regarding Water Conservation in California (MOU) and therefore has submitted the annual report required by the California Urban Water Conservation Council (CUWCC) pursuant to section 10631(i) in order to comply with the all of the requirements of 10631 subdivision (f). In Appendix I IRWD has provided the CUWCC reports for the last reporting cycle, which covered Fiscal Year 2013-14 and Fiscal Year 2014-15. Also included in Appendix I are the coverage reports from the CUWCC documenting that IRWD is on track with the MOU coverage requirements and is in full compliance.

10. PLAN ADOPTION, SUBMITTAL, AND IMPLEMENTATION

Law

> 10642…Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.
>
> 10608.26(a) Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.
>
> 10643 An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.
>
> 10644(a) An urban water supplier shall submit to the department, The California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.
>
> 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.

Inclusion of All 2015 Data

IRWD's 2015 UWMP reports the water use and planning data on a fiscal year basis. The water use and required data in IRWD's UWMP is shown as through June 30, 2015. This 2015 UWMP serves as an update to IRWD's 2010 plan.

Notice of Public Hearing

Pursuant to Water Code Sections 10621(b) and 10642, IRWD provided notice to the seven cities, County of Orange and the public of IRWD's planned public hearing. The public hearing provides an opportunity for the cities, county served by IRWD and any interested party an opportunity to provide input on the UWMP prior to its adoption. IRWD's notifications are described below.

As stated in Section 2.6, during the preparation of the 2015 UWMP, IRWD notified, in writing, all of the cities within IRWD's service area and the County of Orange of IRWD's update to the plan and provided the opportunity for the cities and county to submit comments during the update process. As required, this notification was dated, more than 60 days prior to the public hearing date. Copies of the letters notifying the cities and County of Orange of IRWD's update

to the UWMP are included in Appendix C. IRWD did not receive any comments from the cities or county with regards to the 2015 UWMP update.

On May 25, 2016, IRWD notified all of the cities within IRWD's service area and the County of Orange of IRWD's scheduled public hearing. This notification is also included in Appendix C. The list of cities and County and notifications by IRWD are shown below in DWR Table 10-1.

DWR Table 10-1: IRWD Notification to Cities and Counties

City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Irvine, Tustin, Orange,	☑	☑
Lake Forest, Newport Beach	☑	☑
Costa Mesa	☑	☑
County Name *Drop Down List*	**60 Day Notice**	**Notice of Public Hearing**
Add additional rows as needed		
Orange County	☑	☑
	☐	☐

In accordance with Government Code 6066, on May 30 and June 6, 2016, IRWD published the following notice in the Orange County Register regarding a public hearing on IRWD's 2015 UWMP.

NOTICE OF PUBLIC HEARING
IRVINE RANCH WATER DISTRICT ADOPTION OF
2015 URBAN WATER MANAGEMENT PLAN

Notice is hereby given that the Board of Directors of Irvine Ranch Water District will conduct a public hearing at 5:00 p.m. on June 13, 2016, in the District office located at 15600 Sand Canyon Avenue, Irvine, California for the purpose of receiving public comments concerning the proposed adoption of IRWD's 2015 Urban Water Management Plan, as required under the California Urban Water Management Planning Act. Any person desiring to make comments or present information to the Board may make an oral presentation at the public hearing or may submit written comments or information for the Board's consideration by delivering them to the District office prior to the time of the hearing. A draft of the Plan is available for review on IRWD's Web site (www.irwd.com) or at the District office at the above address.

Leslie Bonkowski
District Secretary

As required, this public notice included the time and place of hearing, as wells as the location where the plan is available for inspection. The draft UWMP was made available for public review on IRWD's website at www.irwd.com and copies available through request at IRWD's offices. Following is a copy of the proof of publication and signed affidavit of posting.

On June 13, 2016, the IRWD District Secretary posted a "Notice of Continuance of Public Hearing of the Board of Directors of the Irvine Ranch Water District", at IRWD and on IRWD's website, which notified the public that the Public Hearing on the 2015 UWMP scheduled to be held on June 13, 2016 is continued to Monday, June 27, 2016, at 5:00 p.m. Following are copies of the Notice of Adjournment of the June 13, 2016 meeting and Notice of Continuance to June 27, 2016.

Public Hearing and Adoption

IRWD held a public hearing to adopt the UWMP on June 27, 2016. The public hearing provided an opportunity for the public to provide input to the plan before it was adopted. and no comments were received from the public. The adoption of the UWMP was combined with the public hearing. Following the public hearing, IRWD's Board of Directors adopted the UWMP by Resolution No. 2016-9. IRWD's signed adoption resolution is included under Appendix B.

Plan Submittal and Public Availability

Pursuant to Water Code Section 10621(d), within 30 days of adoption and by July 1, 2016, IRWD submitted its 2015 UWMP to the DWR on June 30, 2016. IRWD's complete UWMP and separate standardized tables were submitted electronically to DWR.

IRWD completed the following UWMP checklist to confirm that the required elements have been included in the UWMP. Page information on the checklist indicates where the required element can be found with the UWMP. This completed checklist has been submitted to DWR to support its review of the UWMP.

As required, within 30 days of adoption, IRWD submitted a CD of the adopted 2015 UWMP to the California State Library at:

California State Library
Government Publications Section
P.O. Box 942837
Sacramento, CA 94237-0001
Attention: Coordinator, Urban Water Management Plans

Pursuant to Water Code Section 10635(b), not later than 30 days after adoption, IRWD submitted an electronic copy of the adopted 2015 UWMP to the cities of Irvine, Tustin, Orange, Lake Forest, Newport Beach, Costa Mesa, Santa Ana and to the County of Orange. Also, pursuant to Water Code Section 10645, IRWD made the 2015 UWMP available to the public review during normal business hours. In addition, IRWD has placed a link to the adopted UWMP on IRWD's website www.irwd.com.

AFFIDAVIT OF PUBLICATION

STATE OF CALIFORNIA,)
) ss.
County of Orange)

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 principal clerk of **The Orange County Register**, a newspaper of general circulation, published in the city of Santa Ana, County of Orange, and which newspaper has been adjudged to be a newspaper of general circulation by the Superior Court of the County of Orange, State of California, under the date of November 19, 1905, Case No. A-21046, that the notice, of which the annexed is a true printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

May 30, 2016, June 6, 2016

"I certify (or declare) under the penalty of perjury under the laws of the State of California that the foregoing is true and correct":

Executed at Santa Ana, Orange County, California, on

Date: June 6, 2016

Signature

The Orange County Register
625 N. Grand Ave.
Santa Ana, CA 92701
(714) 796-2209

PROOF OF PUBLICATION

NOTICE OF PUBLIC HEARING
IRVINE RANCH WATER DISTRICT ADOPTION OF
2015 URBAN WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN that the Board of Directors of Irvine Ranch Water District will conduct a public hearing at 5:00 p.m. on June 13, 2016, in the District office located at 15600 Sand Canyon Avenue, Irvine, California for the purpose of receiving public comments concerning the proposed adoption of IRWD's 2015 Urban Water Management Plan, as required under the California Urban Water Management Planning Act. Any person desiring to make comments or present information to the Board may make an oral presentation at the public hearing or may submit written comments or information for the Board's consideration by delivering them to the District office prior to the time of the hearing. A draft of the Plan is available for review on IRWD's Web site (www.irwd.com) or at the District office at the above address. Dated: May 24, 2016 /s/ Leslie Bonkowski, District Secretary.
Published: Orange County Register May 30, June 6, 2016 R-976 10168206.

STATE OF CALIFORNIA)
) SS.
COUNTY OF ORANGE)

AFFIDAVIT OF POSTING

NOTICE OF FILING OF RESOLUTIONS AND OF
A TIME AND PLACE OF A HEARING THEREON
RELATIVE TO 2015 URBAN WATER MASTER PLAN

I, Nancy Savedra, being first duly sworn, deposes and says:

THAT I am now and was at all times herein mentioned a citizen of the United States over the age of 18 years and competent to be a witness herein.

THAT on May 24, 2016, I securely and conspicuously posted a copy of the Notice of Time and Place of a Hearing Thereon Relative to the 2015 Urban Water Master Plan located at public bulletin board of the offices of the Irvine Ranch Water District, 15600 Sand Canyon Avenue, Irvine, California.

THAT a copy of said Notice is attached hereto as Exhibit "A" and it is in all respects the same as that posted.

Dated: May 24, 2016

Nancy Savedra, Assistant District Secretary
IRVINE RANCH WATER DISTRICT

EXHIBIT "A"

NOTICE OF PUBLIC HEARING
IRVINE RANCH WATER DISTRICT ADOPTION OF
2015 URBAN WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN that the Board of Directors of Irvine Ranch Water District will conduct a public hearing at 5:00 p.m. on June 13, 2016, in the District office located at 15600 Sand Canyon Avenue, Irvine, California for the purpose of receiving public comments concerning the proposed adoption of IRWD's 2015 Urban Water Management Plan, as required under the California Urban Water Management Planning Act. Any person desiring to make comments or present information to the Board may make an oral presentation at the public hearing or may submit written comments or information for the Board's consideration by delivering them to the District office prior to the time of the hearing. A draft of the Plan is available for review on IRWD's Web site (www.irwd.com) or at the District office at the above address.

Dated: May 24, 2016 /s/ Leslie Bonkowski, District Secretary

**NOTICE OF ADJOURNMENT OF REGULAR MEETING
OF THE BOARD OF DIRECTORS OF
THE IRVINE RANCH WATER DISTRICT**

Notice is hereby given that the regular meeting of the Board of Directors of Irvine Ranch Water District scheduled on Monday, June 13, 2016 at the hour of 5:00 p.m. at the principal office of the District, at 15600 Sand Canyon Avenue, Irvine, California was adjourned due to a lack of a quorum.

Dated this 13th day of June, 2016.

Secretary of the Board of Directors
of Irvine Ranch Water District

NOTICE OF CONTINUANCE OF PUBLIC HEARING OF THE BOARD OF DIRECTORS OF THE IRVINE RANCH WATER DISTRICT

Notice is hereby given that the Public Hearing on the 2015 Urban Water Management Plan scheduled to be held at the June 13, 2016 Irvine Ranch Water District Board of Directors' meeting, due to a lack of a quorum, is continued to Monday, June 27, 2016 at the hour of 5:00 p.m. or soon thereafter as practicable at the principal office of the District, at 15600 Sand Canyon Avenue, Irvine, California.

Dated this 13th day of June, 2016.

Secretary of the Board of Directors
of Irvine Ranch Water District

adjrmmnt.doc

STATE OF CALIFORNIA)
) SS
COUNTY OF ORANGE)

Affidavit of Posting Notice
of Continued Public Hearing

I, Leslie Bonkowski, the duly chosen, qualified Secretary of the Board of Directors of Irvine Ranch Water District, do hereby certify that on June 13, 2016, that due to a lack of a quorum of the regular meeting of the Board of Directors of Irvine Ranch Water District, the Public Hearing identified in the attached Notice was continued to June 27, 2016. I posted a copy of said Notice at a conspicuous place on or near the door of the place at which said meeting of June 13, 2016 was to be held.

Leslie Bonkowski

Secretary of IRVINE RANCH
WATER DISTRICT and of the Board
of Directors thereof

(Seal)

STATE OF CALIFORNIA)
) SS
COUNTY OF ORANGE)

I, Leslie Bonkowski, Secretary of the Board of Directors of Irvine Ranch Water District, DO HEREBY CERTIFY that the attached Notice of Continuance is a true and correct copy, and that the same has not been amended or repealed.

Checklist Arranged by Water Code Section

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location
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 5.1
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 Appendix E	Section 5.6
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
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 Appendix 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 5.3
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	Chapter 10
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	N/A
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 Appendix E	Section 5.8
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	N/A

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 2.6
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	Chapters 6 and 7
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 2.6 Chapter 10
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	Chapter 10
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	Section 3.1
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	Section 3.2
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	Section 3.3
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	Section 3.3
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	Section 3.4
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	Sections 6.2 and 6.9
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	Chapter 6
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
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	Section 6.2

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
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
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	Sections 6.2 and 6.9
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	Chapter 7
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	Chapter 7
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(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	Section 4.1
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 4.2
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	Chapter 9

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	N/A
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 6.8
10631(h)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	Section 6.6
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	Chapter 9 and Appendix I
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
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	N/A
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
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 Appendix G
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 8.10
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 8.3

10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	Section 8.4 Appendix G
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	Section 8.5 Appendix G
10632(a)(6)	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency Planning	Section 8.3	Section 8.6 Appendix G
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 8.7
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	Section 9 Appendix H
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 8.8
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
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
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
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
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

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.	System Supplies (Recycled Water)	Section 6.5.4	Section 6.5
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
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
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 7.1
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	Sections 7.2 and 7.3
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	Chapter 10
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	Section 2.6 Chapter 10
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	Chapter 10
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	Chapter 10

10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	Chapter 10
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	Chapter 10
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	Chapter 10
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	Chapter 10
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	Chapter 10

11. VOLUNTARY REPORTING OF ENERGY INTENSITY

Law

CWC 10631.2(a)
In addition to the requirements of Section 10631, an urban water management plan may, but is not required to, include any of the following information:
(1) An estimate of the amount of energy used to extract or divert water supplies.
(2) An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
(3) An estimate of the amount of energy used to treat water supplies.
(4) An estimate of the amount of energy used to distribute water supplies through its distribution systems.
(5) An estimate of the amount of energy used for treated water supplies in comparison to the amount used for non-treated water supplies.
(6) An estimate of the amount of energy used to place water into or withdraw from storage.
(7) Any other energy-related information the urban water supplier deems appropriate.

CWC 10631.2 (b)
The department shall include in its guidance for the preparation of urban water management plans a methodology for the voluntary calculation or estimation of the energy intensity of urban water systems. The department may consider studies and calculations conducted by the Public Utilities Commission in developing the methodology.

The energy intensity data provided in Tables O-1C and O-2 have been obtained from IRWD's Embedded Energy Plan, which was commissioned to examine energy use associated with collection, use, reuse, and disposal of water and biosolids in IRWD's service area. The Embedded Energy Plan analyzes historic energy and water data over the time period of 2005-2013 and calculates total energy use and historic embedded energy on an annual basis. The analysis further breaks down water supply into two sub-systems: potable water supply and non-potable water supply. Annualized energy intensity was calculated for each sub-system by aggregating the energy intensities of 108 unique water operations facilities and processes throughout IRWD's system.

DWR Table O-1C: Voluntary Energy Intensity – Multiple Water Delivery Products

Water Delivery Type	Production Volume (AF)	Total Utility (kWh/AF)	Net Utility (kWh/AF)
Retail Potable Deliveries	62668.3	975.0	975.0
Retail Non-Potable (Recycled) Deliveries	30497.6	881.0	881.0
Wholesale Potable Deliveries	-	-	-
Wholesale Non-Potable Deliveries	-	-	-
Agricultural Deliveries	-	-	-
Environmental Deliveries	-	-	-
Other	-	-	-
All Water Delivery Types	0	1856.0	1856.0

DWR Table O-2: Voluntary Energy Intensity – Wastewater & Recycled Water

Reporting Start Date	1/1/2013	Urban Water Supplier Operational Control			
End Date	12/31/2013	Water Management Process			
		Collection / Conveyance	Treatment	Discharge / Distribution	Total
Volume of Wastewater Entering Process (AF)		-	-	-	-
Wastewater Energy Consumed (kWh)		-	-	-	-
Wastewater Energy Intensity (kWh/AF)		-	-	-	523.0
Volume of Recycled Water Entering Process (AF)		-	-	-	-
Recycled Water Energy Consumed (kWh)		-	-	-	-
Recycled Water Energy Intensity (kWh/AF)		-	-	-	881.0

The 2013 energy intensity values were used for reporting in this UWMP as they best represent the current energy use of each facility. An average of 1,663 kWh/AF of energy is used for potable water delivered to an IRWD customer. Of that energy needed, 975 kWh/AF are consumed by IRWD-owned facilities, while the remainder is consumed upstream of IRWD by wholesale agencies to import and treat that water. An average of 1,110 kWh/AF of energy is used for non-potable water delivered to an IRWD customer. Of that energy needed, 881 kWh/AF are consumed by IRWD-owned facilities, while the remainder is consumed upstream of IRWD to import supplemental non-potable water. An average of 596 kWh/AF of energy is used to collect and treat sewage from an IRWD customer. Of that energy needed, 523 kWh/AF are consumed by IRWD-owned facilities, while the remainder are consumed downstream of IRWD to further treat sewage at Orange County Sanitation District and Santa Margarita Water District.

Detailed methodologies and calculations for the embedded energy values reported here can be found in the full Embedded Energy Plan, which is available on IRWD's website at http://www.irwd.com/doing-business/energy-saving-programs.

APPENDIX A: Reference Documents

Irvine Ranch Water District
Urban Water Management Plan

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1) *Water Resources Master Plan*, Irvine Ranch Water District, Updated 2007
2) *2010 Urban Water Management Plan*, Irvine Ranch Water District, June 2011
3) *Southern California's Integrated Water Resources Plan*, Metropolitan Water District of Southern California, March 1996
4) *2015 Integrated Water Resources Plan Update*, Metropolitan Water District of Southern California, January 2016
5) *Master Plan Report*, Orange County Water District, April, 1999
6) *Groundwater Management Plan*, Orange County Water District, March, 2004, Updated June 2015
7) *Final Draft Long-Term Facilities Plan*, Orange County Water District, January 2006
8) *Section 15 of the Rules and Regulations – Water Conservation and Water Supply Shortage Program*, Irvine Ranch Water District, August 2015
9) *Water Shortage Contingency Plan*, Irvine Ranch Water District, October 2014
10) *2015 Urban Water Management Plan*, Metropolitan Water District of Southern California, March 2016
11) *2015 Urban Water Management Plan*, Municipal Water District of Orange County, May 2016

APPENDIX B: Resolution No. 2016-9

The Irvine Ranch Water District Adopting the
2015 Urban Water Management Plan

RESOLUTION NO. 2016 -9

IRVINE RANCH WATER DISTRICT
RESCINDING RESOLUTION NO. 2011-19 AND ADOPTING
THE 2015 URBAN WATER MANAGEMENT PLAN
FOR SAID DISTRICT

WHEREAS, Irvine Ranch Water District is a California Water District organized and existing under the California Water District Law; and

WHEREAS, pursuant to Section 10620 et seq. of the California Water Code the District prepared and adopted an Urban Water Management Plan for said District on June 13, 2010; and

WHEREAS, the Board of Directors of the District, pursuant to Section 10621 of the Water Code has reviewed the Plan and directed that it be amended; and

WHEREAS, the amended Plan, entitled "2015 Urban Water Management Plan" has been made available for public inspection and notice of a public hearing thereon has been given pursuant to Section 6066 of the California Government Code; and

WHEREAS, at the time set, the duly noticed public hearing was held and all persons interested were given an opportunity to be heard concerning any matter set forth in the Plan.

NOW, THEREFORE, the Board of Directors of the Irvine Ranch Water District does hereby RESOLVE, DETERMINE and ORDER as follows:

Section 1. Resolution No. 2011-19 adopted the 13th day of June 2011 be and hereby is rescinded in its entirety.

Section 2. The 2015 Urban Water Management Plan of the Irvine Ranch Water District, dated June 2016, is hereby adopted pursuant to Section 10642 of the California Water Code.

Section 3. The District Secretary is directed to file a copy of the 2015 Urban Water Management Plan of the Irvine Ranch Water District with the Department of Water Resources of the State of California, pursuant to Section 10644 of the California Water Code.

ADOPTED, SIGNED and APPROVED this 27th day of June, 2016.

President, IRVINE RANCH WATER DISTRICT
and of the Board of Directors thereof

Asst Secretary, IRVINE RANCH WATER DISTRICT
and of the Board of Directors thereof

APPROVED AS TO FORM:
BOWIE, ARNESON, WILES & GIANNONE
Legal Counsel - IRWD

By: _____

STATE OF CALIFORNIA)
) SS.
COUNTY OF ORANGE)

I, Nancy Savedra, Assistant Secretary of the Board of Directors of Irvine Ranch Water District, do hereby certify that the foregoing Resolution was duly adopted by the Board of Directors of said District at a regular board meeting of said Board held on the 27th day of June 2016, and that it was so adopted by the following vote:

AYES:	DIRECTORS	LaMar, Matheis Reinhart, Swan and Withers
NOES:	DIRECTORS	None
ABSTAIN:	DIRECTORS	None
ABSENT:	DIRECTORS	None

(SEAL)

Assistant Secretary of IRVINE RANCH WATER DISTRICT
and of the Board of Directors thereof

STATE OF CALIFORNIA)
) SS.
COUNTY OF ORANGE)

I, Nancy Savedra, Assistant Secretary of the Board of Directors of Irvine Ranch Water District, do hereby certify that the above and foregoing is a full, true and correct copy of Resolution No. 2016-9 of said Board, and that the same has not been amended or repealed.

Dated: 6/30/16

Assistant Secretary of IRVINE RANCH WATER DISTRICT
and of the Board of Directors thereof

(SEAL)

APPENDIX C: Letters to Cities and County within IRWD Service Area

Irvine Ranch Water District
Urban Water Management Plan

IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

December 23, 2015

Mr. Ernesto Munoz
Public Services Director
City of Costa Mesa
P. O. Box 1200
Costa Mesa, CA 92628-1200

Dear Mr. Munoz:

As you may be aware, pursuant to the California Water Code, Irvine Ranch Water District (IRWD) updates its Urban Water Management Plan every five years in years ending in "0" and "5". This effort helps ensure we can provide our service area including the City of Costa Mesa with a reliable supply of high-quality water to meet current and future demand.

Because comprehensive water resource planning is so critical, the California Water Code mandates all urban water purveyors notify the city or county they serve of this planning effort and solicit any comments in updating the Urban Water Management Plan. Comments may include information on land-use planning decisions in your city that may impact water consumption over the next 20 years.

IRWD's 2015 Urban Water Management Plan, which is due by July 1, 2016, is also being coordinated with the Municipal Water District of Orange County (MWDOC) for inclusion in its Regional Urban Water Management Plan. Metropolitan Water District of Southern California (MWD) supplies imported water from Northern California and the Colorado River to nearly 18 million people in six Southern California counties. MWDOC, a MWD member agency, is the water wholesaler and resource-planning agency for Orange County. The result of these collaborative efforts will be an all-inclusive plan that will assist in better managing one of California's most precious resources.

You may contact Kellie Welch at (949) 453-5604 or Jo Ann Corey at (949) 453-5326 if you should have any comments or questions on IRWD's 2015 Urban Water Management Plan.

Sincerely,

FMSanchez

Fiona M. Sanchez
Director of Water Resources

IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

December 23, 2015

Mr. Manuel Gomez
Public Works Director
City of Irvine
P. O. Box 19575
Irvine, CA 92623-9575

Dear Mr. Gomez:

As you may be aware, pursuant to the California Water Code, Irvine Ranch Water District (IRWD) updates its Urban Water Management Plan every five years in years ending in "0" and "5". This effort helps ensure we can provide our service area including the City of Irvine with a reliable supply of high-quality water to meet current and future demand.

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Fiona M. Sanchez
Director of Water Resources

IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

December 23, 2015

Mr. Thomas Wheeler, P.E.
Public Works Director
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

Dear Mr. Wheeler:

As you may be aware, pursuant to the California Water Code, Irvine Ranch Water District (IRWD) updates its Urban Water Management Plan every five years in years ending in "0" and "5". This effort helps ensure we can provide our service area including the City of Lake Forest with a reliable supply of high-quality water to meet current and future demand.

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Sincerely,

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Fiona M. Sanchez
Director of Water Resources

IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

December 23, 2015

Mr. David Webb
Public Works Director
City of Newport Beach
P.O. Box 1768
Newport Beach, CA 92658-8915

Dear Mr. Webb:

As you may be aware, pursuant to the California Water Code, Irvine Ranch Water District (IRWD) updates its Urban Water Management Plan every five years in years ending in "0" and "5". This effort helps ensure we can provide our service area including the City of Newport Beach with a reliable supply of high-quality water to meet current and future demand.

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Fiona M. Sanchez
Director of Water Resources

IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

December 23, 2015

Mr. Joseph DeFrancesco
Public Works Director
City of Orange
P.O. Box 449
Orange, CA 92866-1591

Dear Mr. DeFrancesco:

As you may be aware, pursuant to the California Water Code, Irvine Ranch Water District (IRWD) updates its Urban Water Management Plan every five years in years ending in "0" and "5". This effort helps ensure we can provide our service area including the City of Orange with a reliable supply of high-quality water to meet current and future demand.

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Sincerely,

FMSanchez

Fiona M. Sanchez
Director of Water Resources

IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

December 23, 2015

Mr. Douglas Stack
Public Works Director
City of Tustin
300 Centennial Way
Tustin, CA 92780

Dear Mr. Stack:

As you may be aware, pursuant to the California Water Code, Irvine Ranch Water District (IRWD) updates its Urban Water Management Plan every five years in years ending in "0" and "5". This effort helps ensure we can provide our service area including the City of Tustin with a reliable supply of high-quality water to meet current and future demand.

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Sincerely,

FMSanchez

Fiona M. Sanchez
Director of Water Resources

IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

December 23, 2015

Mr. Shane Silsby, P.E.
Public Works Director
County of Orange
P.O. Box 4048
Santa Ana, CA 92702-4048

Dear Mr. Silsby:

As you may be aware, pursuant to the California Water Code, Irvine Ranch Water District (IRWD) updates its Urban Water Management Plan every five years in years ending in "0" and "5". This effort helps ensure we can provide our service area including the County of Orange with a reliable supply of high-quality water to meet current and future demand.

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Sincerely,

Fiona M. Sanchez
Director of Water Resources

IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

May 25, 2016

Ernesto Munoz
Public Services Director
City of Costa Mesa
P. O. Box 1200
Costa Mesa, CA 92628-1200

Dear Mr. Munoz:

As you may be aware, pursuant to the California Water Code, Irvine Ranch Water District (IRWD) updates its Urban Water Management Plan every five years in years ending in "0" and "5". This effort helps ensure we can provide our service area, including the City of Costa Mesa, with a reliable supply of high-quality water to meet current and future demand.

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IRWD will hold a public hearing on the draft 2015 UWMP on June 13, 2016 when the Board of Directors will consider its adoption. A copy of the draft 2015 UWMP is available on the District's website, www.irwd.com or a hard copy is available for review at IRWD. Comments on the draft 2015 Urban Water Management Plan may be mailed to Jo Ann Corey, Engineering Technician or Kellie Welch, Water Resources Manager by June 10, 2016.

Sincerely,

Fiona M. Sanchez
Director of Water Resources

IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

May 25, 2016

Mr. Manuel Gomez
Public Works Director
City of Irvine
P. O. Box 19575
Irvine, CA 92623-9575

Dear Mr. Gomez:

As you may be aware, pursuant to the California Water Code, Irvine Ranch Water District (IRWD) updates its Urban Water Management Plan every five years in years ending in "0" and "5". This effort helps ensure we can provide our service area, including the City of Irvine, with a reliable supply of high-quality water to meet current and future demand.

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IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

May 25, 2016

Mr. Thomas Wheeler, P.E.
Public Works Director
City of Lake Forest
25550 Commercentre Drive, Suite 100
Lake Forest, CA 92630

Dear Mr. Wheeler:

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Director of Water Resources

IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

May 25, 2016

Mr. David Webb
Public Works Director
City of Newport Beach
P.O. Box 1768
Newport Beach, CA 92658-8915

Dear Mr. Webb:

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IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

May 25, 2016

Mr. Shane Silsby, P.E.
OC Public Works Director
County of Orange
P.O. Box 4048
Santa Ana, CA 92702-4048

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May 25, 2016

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Public Works Director
City of Orange
P.O. Box 449
Orange, CA 92866

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IRWD will hold a public hearing on the draft 2015 UWMP on June 13, 2016 when the Board of Directors will consider its adoption. A copy of the draft 2015 UWMP is available on the District's website, www.irwd.com or a hard copy is available for review at IRWD. Comments on the draft 2015 Urban Water Management Plan may be mailed to Jo Ann Corey, Engineering Technician or Kellie Welch, Water Resources Manager by June 10, 2016.

Sincerely,

Fiona M. Sanchez
Director of Water Resources

IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

May 25, 2016

Mr. Douglas Stack
Public Works Director
City of Tustin
300 Centennial Way
Tustin, CA 92780

Dear Mr. Stack:

As you may be aware, pursuant to the California Water Code, Irvine Ranch Water District (IRWD) updates its Urban Water Management Plan every five years in years ending in "0" and "5". This effort helps ensure we can provide our service area, including the City of Tustin, with a reliable supply of high-quality water to meet current and future demand.

Because comprehensive water resource planning is so critical, the California Water Code mandates all urban water purveyors notify the city or county they serve of this planning effort and solicit any comments in updating the Urban Water Management Plan. Comments may include information on land-use planning decisions in your city that may impact water consumption over the next 20 years.

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Sincerely,

Fiona M. Sanchez
Director of Water Resources

IRVINE RANCH WATER DISTRICT 15600 Sand Canyon Ave., P.O. Box 57000, Irvine, CA 92619-7000 (949) 453-5300

May 25, 2016

Mr. Harvey DeLaTorre
Municipal Water District of Orange County
P.O. Box 20895
Fountain Valley, CA 92728

Dear Mr. DeLaTorre:

As you may be aware, pursuant to the California Water Code, Irvine Ranch Water District (IRWD) updates its Urban Water Management Plan every five years in years ending in "0" and "5". This effort helps ensure we can provide our service area with a reliable supply of high-quality water to meet current and future demand.

Because comprehensive water resource planning is so critical, the California Water Code mandates all urban water purveyors notify the city or county they serve of this planning effort and solicit any comments in updating the Urban Water Management Plan. Comments may include information on land-use planning decisions in your city that may impact water consumption over the next 20 years.

IRWD's 2015 Urban Water Management Plan, which is due by July 1, 2016, is also being coordinated with the Municipal Water District of Orange County (MWDOC) for inclusion in its Regional Urban Water Management Plan. Metropolitan Water District of Southern California (MWD) supplies imported water from Northern California and the Colorado River to nearly 18 million people in six Southern California counties. MWDOC, a MWD member agency, is the water wholesaler and resource-planning agency for Orange County. The result of these collaborative efforts will be an all-inclusive plan that will assist in better managing one of California's most precious resources.

IRWD will hold a public hearing on the draft 2015 UWMP on June 13, 2016 when the Board of Directors will consider its adoption. A copy of the draft 2015 UWMP is available on the District's website, www.irwd.com or a hard copy is available for review at IRWD. Comments on the draft 2015 Urban Water Management Plan may be mailed to Jo Ann Corey, Engineering Technician or Kellie Welch, Water Resources Manager by June 10, 2016.

Sincerely,

Fiona M. Sanchez
Director of Water Resources

APPENDIX D: Water Loss Reporting

Irvine Ranch Water District
Urban Water Management Plan

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: Irvine Ranch Water District

Reporting Year: 2014-2015 7/2014 - 6/2015

Please enter data in the white cells below. Where available, metered values should be used; if metered values are unavailable please estimate a value. Indicate your confidence in the accuracy of the input data by grading each component (n/a or 1-10) using the drop-down list to the left of the input cell. Hover the mouse over the cell to obtain a description of the grades

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

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

Master Meter and Supply Error Adjustments

WATER SUPPLIED

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

						Pcnt:		Value:	
Volume from own sources:	7	45,090.510	acre-ft/yr	6		◉ ○		acre-ft/yr
Water imported:	7	12,989.900	acre-ft/yr	6		○ ◉	13.276	acre-ft/yr
Water exported:	4	86.930	acre-ft/yr	3		◉ ○		acre-ft/yr

Enter negative % or value for under-registration

Enter positive % or value for over-registration

WATER SUPPLIED: **57,980.204** acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:		Value:	
Billed metered:	9	53,857.972	acre-ft/yr				
Billed unmetered:	n/a	0.000	acre-ft/yr				
Unbilled metered:	9	20.664	acre-ft/yr				
Unbilled unmetered:	7	10.815	acre-ft/yr		○ ◉	10.815	acre-ft/yr

Use buttons to select percentage of water supplied OR value

AUTHORIZED CONSUMPTION: ? **53,889.451** acre-ft/yr

WATER LOSSES (Water Supplied - Authorized Consumption) **4,090.753** acre-ft/yr

Apparent Losses

				Pcnt:		Value:	
Unauthorized consumption:		144.951	acre-ft/yr	0.25%	◉ ○		acre-ft/yr

Default option selected for unauthorized consumption - a grading of 5 is applied but not displayed

Customer metering inaccuracies:	7	1,099.564	acre-ft/yr	2.00%	◉ ○		acre-ft/yr
Systematic data handling errors:	5	134.645	acre-ft/yr	0.25%	◉ ○		acre-ft/yr

Default option selected for Systematic data handling errors - a grading of 5 is applied but not displayed

Apparent Losses: ? **1,379.159** acre-ft/yr

Real Losses (Current Annual Real Losses or CARL)

Real Losses = Water Losses - Apparent Losses: ? **2,711.594** acre-ft/yr

WATER LOSSES: **4,090.753** acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: ? **4,122.232** acre-ft/yr

= Water Losses + Unbilled Metered + Unbilled Unmetered

SYSTEM DATA

Length of mains:	9	1,622.2	miles
Number of active AND inactive service connections:	9	102,124	
Service connection density:		63	conn./mile main

Are customer meters typically located at the curbstop or property line? Yes

Average length of customer service line: (length of service line, beyond the property boundary, that is the responsibility of the utility)

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 84.1 psi

COST DATA

Total annual cost of operating water system:	10	$23,253,865	$/Year
Customer retail unit cost (applied to Apparent Losses):	9	$1.95	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):	9	$1,133.00	$/acre-ft

☑ Use Customer Retail Unit Cost to value real losses

Retail costs are less than (or equal to) production costs; please review and correct if necessary

WATER AUDIT DATA VALIDITY SCORE:

*** YOUR SCORE IS: 78 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: Unauthorized consumption

3: Systematic data handling errors

AWWA Free Water Audit Software:
System Attributes and Performance Indicators

WAS v5.0

American Water Works Association.

Water Audit Report for: Irvine Ranch Water District

Reporting Year: 2014-2015 | 7/2014 - 6/2015

*** YOUR WATER AUDIT DATA VALIDITY SCORE IS: 78 out of 100 ***

System Attributes:

	Apparent Losses:	1,379.159	acre-ft/yr
+	Real Losses:	2,711.594	acre-ft/yr
=	Water Losses:	4,090.753	acre-ft/yr
?	Unavoidable Annual Real Losses (UARL):	2,269.55	acre-ft/yr
	Annual cost of Apparent Losses:	$1,171,486	
	Annual cost of Real Losses:	$2,303,282	Valued at Customer Retail Unit Cost

Return to Reporting Worksheet to change this assumpiton

Performance Indicators:

Financial:	Non-revenue water as percent by volume of Water Supplied:	7.1%	
	Non-revenue water as percent by cost of operating system:	15.1%	Real Losses valued at Customer Retail Unit Cost
Operational Efficiency:	Apparent Losses per service connection per day:	12.06	gallons/connection/day
	Real Losses per service connection per day:	23.70	gallons/connection/day
	Real Losses per length of main per day*:	N/A	
	Real Losses per service connection per day per psi pressure:	0.28	gallons/connection/day/psi
	From Above, Real Losses = Current Annual Real Losses (CARL):	2,711.59	acre-feet/year
?	Infrastructure Leakage Index (ILI) [CARL/UARL]:	1.19	

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

APPENDIX E: Copy of SBx7-7 Tables

Irvine Ranch Water District

Urban Water Management Plan

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries	97,216	Acre Feet
	2008 total volume of delivered recycled water	14,358	Acre Feet
	2008 recycled water as a percent of total deliveries	14.77%	Percent
	Number of years in baseline period[1, 2]	15	Years
	Year beginning baseline period range	1991	
	Year ending baseline period range[3]	2005	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2004	
	Year ending baseline period range[4]	2008	

[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 Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.*

[3] *The ending year must be between December 31, 2004 and December 31, 2010.*

[4] *The ending year must be between December 31, 2007 and December 31, 2010.*

SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☐	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☑	**4. Other** DWR recommends pre-review
IRWD used data from Cal State Fullerton's Center for Demographic Research. Peter Brostrom at DWR stated the method is approved by DWR for agencies in the Municipal Water District of Orange County's regional plan, which includes IRWD.	

SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	1991	204,798
Year 2	1992	210,357
Year 3	1993	215,469
Year 4	1994	219,040
Year 5	1995	222,058
Year 6	1996	225,982
Year 7	1997	231,284
Year 8	1998	237,055
Year 9	1999	242,816
Year 10	2000	250,574
Year 11	*2001*	256,610
Year 12	*2002*	266,937
Year 13	*2003*	275,710
Year 14	*2004*	282,869
Year 15	*2005*	293,616
5 Year Baseline Population		
Year 1	2004	282,869
Year 2	2005	293,616
Year 3	2006	302,909
Year 4	2007	310,777
Year 5	2008	320,764
2015 Compliance Year Population		
2015		379,510

SB X7-7 Table 4: Annual Gross Water Use *								
Baseline Year *Fm SB X7-7 Table 3*		**Volume Into Distribution System** *This column will remain blank until SB X7-7 Table 4-A is completed.*	**Deductions**					**Annual Gross Water Use**
			Exported Water	**Change in Dist. System Storage (+/-)**	**Indirect Recycled Water** *This column will remain blank until SB X7-7 Table 4-B is completed.*	**Water Delivered for Agricultural Use**	**Process Water** *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	1991	67,918	-	-	396	18,013	-	49,509
Year 2	1992	65,724	-	-	479	19,594	-	45,651
Year 3	1993	63,660	-	-	470	16,249	-	46,941
Year 4	1994	62,710	-	-	493	12,543	-	49,674
Year 5	1995	61,737	-	-	504	10,048	-	51,185
Year 6	1996	69,305	160	-	368	12,605	-	56,172
Year 7	1997	78,825	220	-	389	15,312	-	62,905
Year 8	1998	67,513	118	-	356	12,106	-	54,933
Year 9	1999	76,487	207	-	251	13,794	-	62,235
Year 10	2000	84,465	217	-	250	16,406	-	67,593
Year 11	2001	77,170	197	-	272	11,413	-	65,288
Year 12	2002	81,072	1,732	-	300	12,523	-	66,517
Year 13	2003	73,335	786	-	425	10,748	-	61,376
Year 14	2004	79,535	590	-	453	10,797	-	67,695
Year 15	2005	73,160	369	-	500	8,654	-	63,638
10 - 15 year baseline average gross water use								**58,087**
5 Year Baseline - Gross Water Use								
Year 1	2004	79,535	590	-	437	10,797	-	67,711
Year 2	2005	73,160	369	-	487	8,654	-	63,651
Year 3	2006	75,826	440	-	391	9,599	-	65,397
Year 4	2007	86,794	199	-	527	10,587	-	75,481
Year 5	2008	82,858	191	-	342	8,799	-	73,526
5 year baseline average gross water use								**69,153**
2015 Compliance Year - Gross Water Use								
2015		71,451	162	-	10,110	6,153	-	**55,026**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source	Imported Treated Water
This water source is:	
☐	The supplier's own water source
☑	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment * *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1991	33,226		33,226
Year 2	1992	24,792		24,792
Year 3	1993	26,671		26,671
Year 4	1994	28,490		28,490
Year 5	1995	29,589		29,589
Year 6	1996	33,067		33,067
Year 7	1997	37,144		37,144
Year 8	1998	31,829		31,829
Year 9	1999	34,273		34,273
Year 10	2000	29,585		29,585
Year 11	2001	30,642		30,642
Year 12	2002	28,029		28,029
Year 13	2003	21,076		21,076
Year 14	2004	26,553		26,553
Year 15	2005	20,920		20,920
5 Year Baseline - Water into Distribution System				
Year 1	2004	26,553		26,553
Year 2	2005	20,920		20,920
Year 3	2006	23,375		23,375
Year 4	2007	24,747		24,747
Year 5	2008	21,911		21,911
2015 Compliance Year - Water into Distribution System				
2015		12,952		12,952

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source		Treated Groundwater		
This water source is:				
☑	The supplier's own water source			
☐	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment * *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1,991	19524.4		19,524
Year 2	1,992	20918.2		20,918
Year 3	1,993	20968.9		20,969
Year 4	1,994	21088.8		21,089
Year 5	1,995	20564		20,564
Year 6	1,996	21277		21,277
Year 7	1,997	21040.5		21,041
Year 8	1,998	21035.6		21,036
Year 9	1,999	22656.5		22,657
Year 10	2,000	29443		29,443
Year 11	2,001	29950.1		29,950
Year 12	2,002	31998.5		31,999
Year 13	2,003	36822		36,822
Year 14	2,004	35207.3		35,207
Year 15	2,005	37099.8		37,100
5 Year Baseline - Water into Distribution System				
Year 1	2,004	35207.3		35,207
Year 2	2,005	37099.8		37,100
Year 3	2,006	39293		39,293
Year 4	2,007	40146.5		40,147
Year 5	2,008	42075.9		42,076
2015 Compliance Year - Water into Distribution System				
2015		46,306		46,306
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source		Untreated Supply - Irvine Lake		
This water source is:				
☑	The supplier's own water source			
☑	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment * *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1,991	**11944.8**		11,945
Year 2	1,992	**16677.8**		16,678
Year 3	1,993	**11576.6**		11,577
Year 4	1,994	**7838.7**		7,839
Year 5	1,995	**7247.7**		7,248
Year 6	1,996	**10479.8**		10,480
Year 7	1,997	**12575.1**		12,575
Year 8	1,998	**10145.1**		10,145
Year 9	1,999	**15754.4**		15,754
Year 10	2,000	**16703.2**		16,703
Year 11	2,001	11204.1		11,204
Year 12	2,002	11080.2		11,080
Year 13	2,003	9675		9,675
Year 14	2,004	9132.7		9,133
Year 15	2,005	7054.7		7,055
5 Year Baseline - Water into Distribution System				
Year 1	2,004	**9132.7**		9,133
Year 2	2,005	**7054.7**		7,055
Year 3	2,006	**8792.3**		8,792
Year 4	2,007	**11021.5**		11,022
Year 5	2,008	**9360.8**		9,361
2015 Compliance Year - Water into Distribution System				
2015		3,035		3,035
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
Irvine Lake source includes untreated imported water into the lake plus native water in the lake.				

SB X7-7 Table 4-A: Volume Entering the Distribution				
Name of Source		Non-potable wells and RWS		
This water source is:				
☑	The supplier's own water source			
☐	A purchased or imported source			
Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment * *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	1,991	3223.2		3,223
Year 2	1,992	3336.1		3,336
Year 3	1,993	4443.6		4,444
Year 4	1,994	5291.8		5,292
Year 5	1,995	4336.9		4,337
Year 6	1,996	4481.8		4,482
Year 7	1,997	8066.1		8,066
Year 8	1,998	4503		4,503
Year 9	1,999	3802.9		3,803
Year 10	2,000	8733.8		8,734
Year 11	2,001	5374		5,374
Year 12	2,002	9963.7		9,964
Year 13	2,003	5761.9		5,762
Year 14	2,004	8641.3		8,641
Year 15	2,005	8085.4		8,085
5 Year Baseline - Water into Distribution System				
Year 1	2,004	8641.3		8,641
Year 2	2,005	8085.4		8,085
Year 3	2,006	4366.4		4,366
Year 4	2,007	10878.4		10,878
Year 5	2,008	9510.5		9,511
2015 Compliance Year - Water into Distribution System				
2015		9,158		9,158
** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*				
NOTES: Non-potable wells recycled water supplement				

SB X7-7 Table 4-B: Indirect Recycled Water Use Deduction *(For use only by agencies that are deducting indirect recycled water)*

Baseline Year *Fm SB X7-7 Table 3*		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	1991			-		-	396		396	396
Year 2	1992			-		-	479		479	479
Year 3	1993			-		-	470		470	470
Year 4	1994			-		-	493		493	493
Year 5	1995			-		-	504		504	504
Year 6	1996			-		-	368		368	368
Year 7	1997			-		-	389		389	389
Year 8	1998			-		-	356		356	356
Year 9	1999			-		-	251		251	251
Year 10	2000			-		-	250		250	250
Year 11	2001			-		-	272		272	272
Year 12	2002			-		-	300		300	300
Year 13	2003			-		-	425		425	425
Year 14	2004			-		-	453		453	453
Year 15	2005			-		-	500		500	500
5 Year Baseline - Indirect Recycled Water Use										
Year 1	2004			-		-	437		437	437
Year 2	2005			-		-	487		487	487
Year 3	2006			-		-	391		391	391
Year 4	2007			-		-	527		527	527
Year 5	2008			-		-	342		342	342
2015 Compliance - Indirect Recycled Water Use										
2015				-		-	10,110		10,110	10,110

**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: IRWD's percentage of Groundwater Replenishment System, based on percentage of groundwater pumped from OC Basin (managed by Orange County Water District)

SB X7-7 Table 4-C.4: Process Water Deduction Eligibility

Criteria 4

Disadvantaged Community

Use IRWM DAC Mapping tool

http://www.water.ca.gov/irwm/grants/resources_dac.cfm

California Median Household Income		Service Area Median Household Income	Percentage of Statewide Average	**Eligible for Exclusion? Y/N**
2015 Compliance Year - Process Water Deduction Eligibility				
2010	$53,046		0%	YES

A "Disadvantaged Community" is a community with a median household income less than 80 percent of the statewide average.

SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	1991	204,798	49,509	216
Year 2	1992	210,357	45,651	194
Year 3	1993	215,469	46,941	194
Year 4	1994	219,040	49,674	202
Year 5	1995	222,058	51,185	206
Year 6	1996	225,982	56,172	222
Year 7	1997	231,284	62,905	243
Year 8	1998	237,055	54,933	207
Year 9	1999	242,816	62,235	229
Year 10	2000	250,574	67,593	241
Year 11	2001	256,610	65,288	227
Year 12	2002	266,937	66,517	222
Year 13	2003	275,710	61,376	199
Year 14	2004	282,869	67,695	214
Year 15	2005	293,616	63,638	193
10-15 Year Average Baseline GPCD				**214**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2004	282,869	67,711	214
Year 2	2005	293,616	63,651	194
Year 3	2006	302,909	65,397	193
Year 4	2007	310,777	75,481	217
Year 5	2008	320,764	73,526	205
5 Year Average Baseline GPCD				**204**
2015 Compliance Year GPCD				
2015		379,510	55,026	**129**

SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	214
5 Year Baseline GPCD	204
2015 Compliance Year GPCD	129

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☑	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☐	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator

SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
214	**171**

SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
204	194	171	**171**

[1]Maximum 2020 Target is 95% of the 5 Year Baseline GPCD *[2]2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.*

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
171	214	**192**

SB X7-7 Table 9: 2015 Compliance								
		Optional Adjustments *(in GPCD)*						
		Enter "0" if Adjustment Not Used						
Actual 2015 GPCD	2015 Interim Target GPCD	Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2015 GPCD	2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
129	192	-	-	-	-	129	129	**YES**

Deduction Calculation for Indirect Potable Reuse of Recycled Water

Recycled Water Recharge for Indirect Potable Reuse								
Fiscal Year Ending	(1) OCWD Total Groundwater Recharge with Recycled Water (Acre-Feet)	(2) 5-Year Average Recharge with Recycled Water (Acre-Feet)	(3) Loss Factor for Recharge & Recovery	(2) x (3) = (4) Volume of Recycled Water Recharge Entering Distribution System (Acre-Feet)	(5) Total OCWD Basin Production	(4)/(5) = (6) Percent of Total Basin Production from Recharged Recyled Water	(7) IRWD OCWD Groundwater Basin Potable Production	(6) x (7) = (8) IRWD IPR Credit
1990	6,498	6,498	96.5%	6,271	229,878	2.73%	N/A	N/A
1991	6,634	6,498	96.5%	6,271	235,532	2.66%	14,892	396
1992	6,843	6,566	96.5%	6,336	244,333	2.59%	18,478	479
1993	8,161	6,658	96.5%	6,425	243,629	2.64%	17,817	470
1994	5,042	7,034	96.5%	6,788	237,837	2.85%	17,270	493
1995	2,738	6,636	96.5%	6,403	276,096	2.32%	21,722	504
1996	4,282	5,884	96.5%	5,678	302,273	1.88%	19,610	368
1997	4,389	5,413	96.5%	5,224	310,217	1.68%	23,122	389
1998	2,496	4,922	96.5%	4,750	297,726	1.60%	22,343	356
1999	3,489	3,789	96.5%	3,657	322,476	1.13%	22,149	251
2000	5,774	3,479	96.5%	3,357	320,250	1.05%	22,888	240
2001	2,067	4,086	96.5%	3,943	323,129	1.22%	22,280	272
2002	4,143	3,643	96.5%	3,515	322,590	1.09%	27,569	300
2003	3,867	3,594	96.5%	3,468	274,927	1.26%	33,687	425
2004	1,784	3,868	96.5%	3,733	266,969	1.40%	32,414	453
2005	4,156	3,527	96.5%	3,404	232,199	1.47%	34,118	500
2006	4,086	3,203	96.5%	3,091	215,172	1.44%	27,680	398
2007	218	3,607	96.5%	3,481	284,706	1.22%	43,979	538
2008	17,792	2,822	96.5%	2,723	351,622	0.77%	45,303	351
2009	54,261	5,607	96.5%	5,411	310,586	1.74%	45,468	792
2010	65,950	16,103	96.5%	15,539	273,889	5.67%	45,057	2,556
2011	66,083	28,461	96.5%	27,465	248,659	11.05%	37,703	4,164
2012	71,678	40,861	96.5%	39,431	266,066	14.82%	43,340	6,423
2013	72,877	55,153	96.5%	53,223	298,175	17.85%	44,024	7,858
2014	66,167	66,170	96.5%	63,854	318,967	20.02%	49,607	9,931
2015	76,546	68,551	96.5%	66,152	296,292	22.33%	45,284	10,110

[1] Indirect is recycled water for groundwater recharge through spreading and injection of GWRS and Water Factory 21. The yearly totals are apportioned among the OCWD Basin agencies on the basis of groundwater production over a five year rolling average.

[2] Loss factor provided by OCWD, includes loss over county lines to LA Basin.

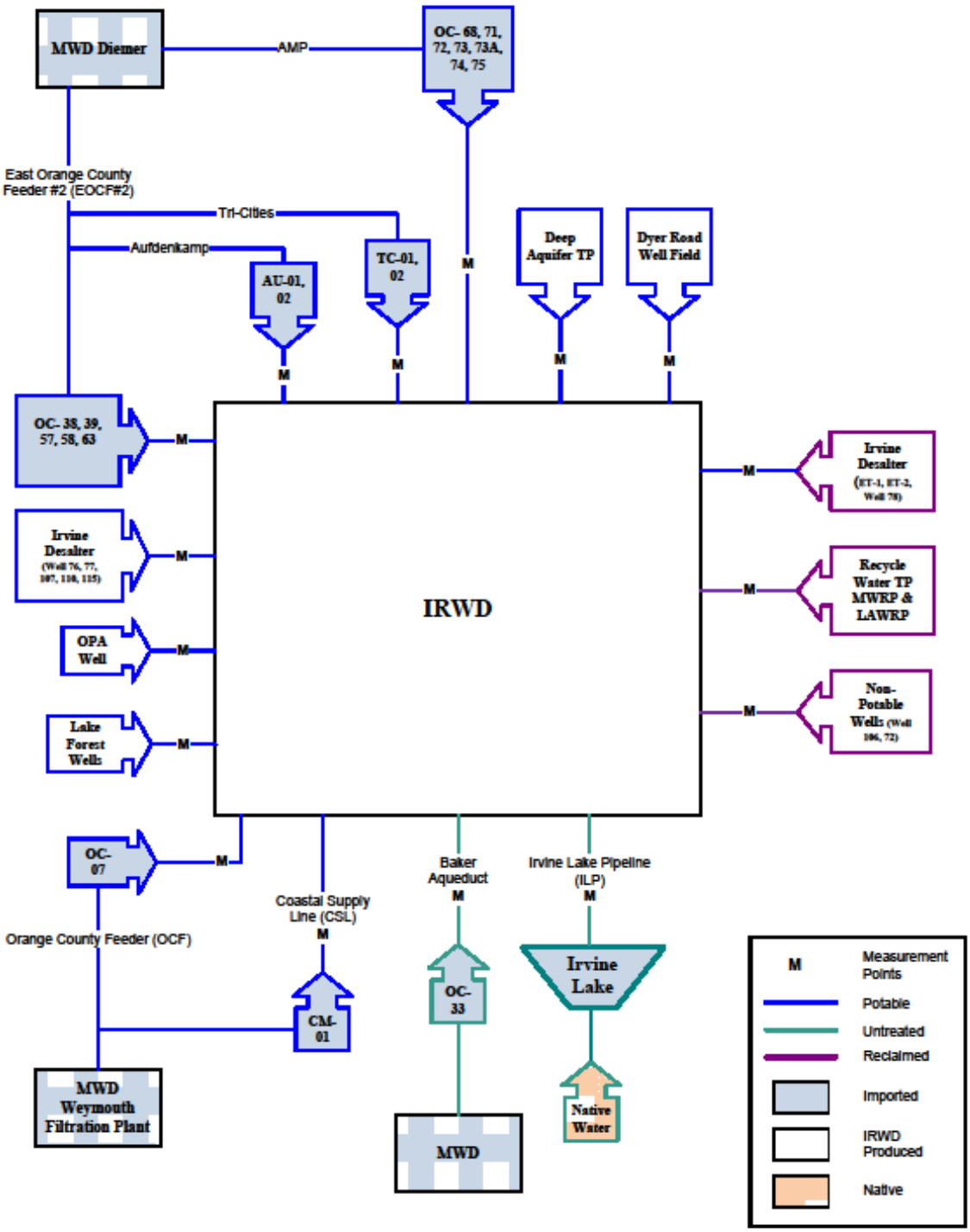
[5] IRWD OCWD groundwater production entering distribution system. Other groundwater, Ag (non M&I) and waste excluded.

APPENDIX F: Distribution System Schematic

Irvine Ranch Water District
Urban Water Management Plan

IRWD's distribution system boundaries are defined by points at which water enters IRWD's distribution system. Those points include master meters for water imported from Metropolitan Water District of Southern California, master meters on IRWD wells for local groundwater, master meters for untreated water entering the distribution system from Irvine Lake, and meters on wells and treatment plants for other non-potable sources of supply, including recycled water.

IRWD Retail Water Supplier System Schematics



APPENDIX G: Water Shortage Contingency Plan

Irvine Ranch Water District
Urban Water Management Plan

WATER SHORTAGE CONTINGENCY PLAN
October 2014

PART I: EXECUTIVE SUMMARY

Background

IRWD's response to a water supply shortage varies depending on the magnitude and nature of the shortfall. A supply shortage is defined as a reduction in total supplies, typically resulting from one of two conditions:

- Drought conditions that limit availability of imported water or local supplies.
- System interruptions that result from emergency outage conditions.

IRWD's response to any water supply shortage depends on the cause, severity and anticipated duration of the shortage. Use of local supplies, storage and other supply augmentation measures can mitigate shortages, and are assumed to be in use to the maximum extent possible during declared shortage levels. The resultant net shortage levels can be addressed by demand reduction programs, as described in this Plan. This document is intended primarily to address drought supply shortages, however at the discretion of the Board, this Plan may also be used to address system outages, although these are more explicitly addressed in IRWD's Water Supply Reliability Study (June 2008).

Supply Shortage Conditions

Given the assumption that the level of water supply shortage experienced at any point in time is net of mitigating supply factors, two basic considerations emerge in formulating a water shortage plan: (1) the shortage must be offset by demand reduction, and (2) the demand reduction program must be incremental in nature since shortage conditions are normally progressive. This means that a shortage contingency plan should be designed to address varying levels of supply deficits with recommended actions predicated upon the actual deficit level. Therefore this plan develops a shortage response based upon four levels of supply cutbacks:

- *Level One* is a shortage warning and low level shortage condition with supply reductions of up to 10%.
- *Level Two* is a significant shortage condition indicated by shortages between 10 to 25%.
- *Level Three* is a severe shortage condition indicated by shortages ranging from 25 to 40%.
- *Level Four* is a crisis shortage condition resulting when shortages exceed 40%.

Each shortage level will trigger a set of response measures aimed at reducing demand to the level of supply. Steps taken within each level should be considered cumulative; that is, Level Two responses will include most if not all the responses in Level One plus the additional actions necessary to meet the Level Two condition. Level Three will include most if not all the responses in Level Two plus the additional measures necessary to meet a Level Three condition, and so on.

However, if a shortage condition persisted over an extended period of time, it may be necessary to implement a higher level response to sustain required reductions. Thus both the severity of supply reductions and the duration over which the reductions are experienced will determine the appropriate response.

Supply Shortage Response Measures

In addition to basic measures which are always in effect, there are three types of response measures that can be implemented by the District in the event of a supply shortage.

- Voluntary measures through increased public outreach, education and awareness (V)
- Demand management through the use of the District's allocation-based rate structure (D).
- Mandatory measures through restrictions on use and enforcement (M).

In general terms, voluntary customer responses and demand management through the use of the allocation-based rate structure will be used in all four shortage levels identified in this plan. A combination of voluntary and demand management strategies are likely to be sufficient to address virtually all shortage levels. Responses to shortages in Levels Three and Four may also include restrictions on use and enforcement. Below is a summary of anticipated supply shortage response measures.

Supply Shortage Response Measure	IRWD Supply Shortage Level	Voluntary (V), Demand Management (D) or Mandatory (M)
Public Education	Always In Effect	
Prohibition of Gutter Flooding	Always In Effect	
Prohibition of Leaks	Always In Effect	
Prohibition of Water Waste	Always In Effect	
Enhanced Public Awareness Campaign	Level One	V
Target Over-Allocation Customers for Surveys/Assistance	Level One	V
Review and Adjust Customer Allocations and/or Tiers as necessary	Level One/Two	D
Reduce Potable and Untreated Irrigation and Agricultural Allocations by 30% or other percentage specified in the shortage level declaration	Level Two	D
Reduce Potable and Untreated Irrigation Allocations by 60% or other percentage specified in the shortage level declaration	Level Three	D
Reduce Commercial, Industrial and Institutional Potable Allocations by 10% or other percentage specified in the shortage level declaration	Level Three	D
Increase Rates for Over-Allocation Use Tiers	Level Three/Four	D
Further reduction of allocations, tightening of tiers and rate increases to achieve necessary demand reductions	Level Four	D/M
Eliminate Outdoor Use (100% reduction)	Level Four	D/M
Mandatory restrictions and enforcement	Level Four	M

These response measures may be applied singly or in combination and may vary according to the severity and duration of the shortage. Other measures may be applied in lieu of or in addition to those described in this plan. The application of shortage level response measures or restrictions may vary as to type of water service. In the implementation of measures or restrictions on potable water service through the declaration of a shortage level, the District will determine and set forth how and to what extent, if any, such measures or restrictions, or different measures or restrictions, will be applied to non-potable water services furnished by the District. IRWD's Board of Directors will declare the level of shortage based on water supply conditions.

Imported Water Supply Shortage

An imported water supply shortage represents one of the main causes of a supply shortage for the District. In 2008 approximately one-third of IRWD's water supply was imported through Metropolitan Water District of Southern California (MWD). While potential reductions in imported water deliveries from MWD can be mitigated to some extent by the addition of other local supplies, such as increased pumping from groundwater facilities, or the conversion of certain potable water uses to recycled water (see IRWD's Water Resources Master Plan (WRPM) and Urban Water Management Plan (UWMP)), the range of shortages projected herein is assumed to be net of those supply augmentation measures. That is, supply shortages identified as, say 20%, is the actual shortage confronted by the District's customers after supply augmentation factors have been implemented. This plan is intended to develop a set of options to reduce demand; the development of supply augmentation options is outside the scope of this analysis and is addressed in the WRMP and UWMP.

In February 2008 the MWD adopted a Water Supply Allocation Plan based on its declared level of shortage. IRWD has performed analysis relating to varying hydrologic conditions, availability of supply augmentation measures and additional conservation. Based on the results of the modeling, Table 1 illustrates IRWD water shortage levels correlated with MWD's allocation shortage plan.

Table 1: IRWD Water Shortage Levels Correlated with MWD Allocation Stages:

MWD Stage	MWD Supply Shortage	IRWD Reliability Range	IRWD Shortage Level
1	5%	97-100%	1
2	10%	95-100%	1
3	15%	93-100%	1
4	20%	91-100%	1
5	25%	88-99%	1 or 2
6	30%	86-97%	2
7	35%	84-95%	2
8	40%	82-92%	2
9	45%	79-89%	2
10	50%	77-88%	2 or 3

The above table assumes a dry local hydrology for multiple years and limited access to groundwater. Actual correlations may differ depending on local hydrology at the time of the shortage.

PART II: SHORTAGE RESPONSE STRATEGIES

Basic Measures Always In Effect

The following basic measures are considered good water management practices, and are always in effect regardless of whether a shortage level is declared. These measures are contained in IRWD's Rules and Regulations (Section 15):

(a) *Gutter Flooding* - No person shall cause or permit any water furnished to any property within the District to run or to escape from any hose, pipe, valve, faucet, sprinkler, or irrigation device into any gutter or otherwise to escape from the property if such running or escaping can reasonably be prevented.

(b) *Leaks* - No person shall permit leaks of water that he has the authority to eliminate.

(c) *Washing Hard Surface Areas* - Washing down hard or paved surfaces, including, but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards.

(d) *Waste* - No person shall cause or permit water under his control to be wasted. Wasteful usage includes, but is not limited to, the uses listed in Section 13(a) of Exhibit 1 to the Memorandum of Understanding Regarding Urban Water Conservation in California, dated December 11, 2002, as amended from time to time, or the counterpart of said list contained in any successor document.

Under the District's allocation-based conservation rate structure that is in effect during non-shortage conditions, customer allocations are limited to the amount that is reasonable for the customer's needs and property characteristics, and reflect the exclusion of these types of wasteful water uses.

Water Supply Shortage Response Measures

IRWD would employ a range of measures in response to potential shortages depending on the level and duration. While the measures will be applied incrementally, this Plan builds in a level of flexibility to adopt additional measures to ensure the appropriate level of demand reduction. The use of IRWD's allocation-based rates and the assessment of higher rates for over-allocation or wasteful use provides IRWD with an additional strategy to help achieve demand reductions.

For illustration purposes, Table 2 shows water reductions requirements that would be required during three shortage conditions, using water demand data from 2007 (See Appendix A for total treated and untreated water demands).

Table 2: Water Conservation Requirements – Acre-Feet:

Shortage Percentage	**10%**	**25%**	**40%**
Treated and Untreated Water	6,673	16,683	26,693
Treated Water Only	5,874	14,686	23,497

In order to achieve the necessary demand reductions, IRWD's measures will progress from voluntary reductions to reduction of discretionary uses through financial incentives or restrictions to reduction of non-discretionary uses through financial incentives or restrictions based on the level of the shortage. Most shortages, unless extreme (Level Four or system outage), can be addressed with a combination of voluntary measures and a reduction of discretionary uses through financial incentives.

Response Measures: Voluntary

The single most important step the District can take in implementing voluntary measures is to inform the public consciousness in order to help reduce water demand. It should be noted that the District has implemented on-going water use efficiency and outreach programs since the early 1990's, and those efforts combined with the allocation-based tiered rates, have resulted in somewhat hardened levels of demand. The District will employ additional strategies to achieve the necessary demand reductions in a shortage situation. Most of the effort will be focused on providing additional outreach to high usage tier customers.

1. *Public Outreach:* An outreach program will educate the public and local leaders on the water supply situation; what actions are proposed; what the intended achievements are; and how these actions are to be implemented. This will be accomplished by having key District personnel present to groups such as the city council, community associations, chambers of commerce, business groups, etc. An endorsement of proposed District plans by these groups will assist in obtaining the public support essential in confronting water shortages.

   The public at large will be informed through press releases, billing inserts, water conservation booths, community association meetings, newsletters, church groups, etc. Literature will be provided on the shortage condition, conservation methods, and water-saving devices and be distributed through the fire and police stations, libraries, city hall, schools, shopping center,

recreation facilities, etc. Certain behavior modifications, such as those listed below, can help address the need for immediate conservation.

- Survey plumbing every two months and eliminate water loss resulting from leaky plumbing fixtures.
- Restrict showers to five minutes or less; fill the bath tub no more than one-quarter full.
- Do not run water unnecessarily while shaving, brushing teeth, bathing, preparing food, etc.
- Run only full loads of laundry and dishes.
- Reduce landscape watering.
- Fill swimming pools to a lower level to minimize water loss due to splashing.

2. *Education Programs:* School programs will focus on the water shortage situation. In addition to the usual District background information, the supply situation and conservation methods will be highlighted. Demonstrations using sample water-saving devices can be given; literature will be distributed.

3. *Logo:* A water conservation or shortage response logo will be adopted and vigorously promoted as a symbol to influence public attitudes toward water use.

4. *Media:* Extensive use of all available forms of media will be employed and coordinated with other agencies. This includes public service messages on radio and television and press releases in local newspapers. The messaging and level of response will be correlated with the need for demand reductions.

5. *Target Over-Allocation Customers:* District staff will ramp up its ongoing outreach efforts to more aggressively target over-allocation customers. Over-allocation use is considered wasteful use; customers in these tiers will be contacted via letter, telephone, e-mail and other means. On-site assistance/audits will help identify the source of the over-allocation use and provide recommendations to address the problem.

6. *Customer Service:* Customers will be encouraged to work together to save water and to call IRWD's water use efficiency experts if assistance is needed to help find water leaks or to use water more water efficiently. If someone observing water waste within IRWD's service area is

unsure who the property owner is they can call in to IRWD's Customer Service Department for assistance. IRWD staff will contact the customer associated with the property and offer on-site assistance and recommendations to address the problem.

Response Measures: Demand Management and Use of Allocation-Based Rates

The allocation-based tiered rate structure adopted by IRWD in 1991 is intended to function as a tool to promote ongoing water use efficiency. Water is allocated on an individual customer basis established upon specific indoor uses and outdoor irrigation needs. The structure includes a five-tiered system for residential customers and a four-tiered system for non-residential customers, and charges progressively higher rates for progressively higher amounts of water used. Use within a customer's allocation is encouraged through a significantly tiered commodity pricing system which discourages wasteful use. The allocation-based tiered rates provide IRWD with an effective mechanism to alter demand through pricing.

Analysis of Usage and Tiers

A detailed analysis of the usage and tiers, with the most recently available data, is one of the first steps that should be undertaken in developing demand management strategies, including potential adjustments to the tiers and allocations. Appendix A: 2007 Annual Usage and Tier Break-Down shows the annual usage and tier break-down information for treated and untreated water sources, based on data from calendar year 2007. The first two tiers shown (1 and 2) indicate usage within allocation. Tiers 3 to 5 indicate over-allocation use.

Basic water allocations should be reviewed on a periodic basis taking into consideration changes since the most recent review of these allocations, including changes to the plumbing code that improve water use efficiency, water conservation devices and more efficient irrigation systems available to the average customer. Beyond this, there are several mechanisms that can be employed either separately or in combination to achieve the necessary level of demand reductions.

Allocation Adjustment Strategies for Demand Management

1. Adjusting the Tier Thresholds: This strategy does not adjust the actual allocation formula itself, but rather adjusts the percentage thresholds for the over-allocation tiers. The current tiers and thresholds for the various account types are shown in Table 3. Adjusting the tier thresholds downward would have the effect of shifting more use into the higher over-allocation tiers. Customers in these tiers would be subjected to increased rates depending on the extent of their use (percentage of use above allocation). Reducing the tier thresholds would send stronger price signals by moving over-using customers into the higher tiers.

Table 3: Allocation-Based Rates Tier Thresholds

Tier	Percentage of Allocation		
	Residential	Irrigation	Non-Residential
Low Volume	0-40%	0-40 %	N/A
Base	41-100%	41 – 100%	0-100%
Inefficient	101 – 150%	101 – 110%	101 – 110%
Excessive	151 -200%	111 -120%	111 -120%
Wasteful	201% +	121% +	121% +

2. Allocation Adjustments: An adjustment to the allocation entails refining the allocation formula. This can be done either as a simple percentage adjustment or by adjusting a specific portion of the formula. For example, residential allocations are made up of an indoor plus an outdoor allocation component. It is possible to adjust the outdoor component downward to allow for less outdoor irrigation or eliminate it altogether depending on the need for demand reductions. Water allocations could also be set to levels that would eliminate all outdoor water use including irrigation, car washing, pool filing, agricultural use of non-recycled water etc. Under this scenario the indoor component could be left the same or could be altered as necessary.

3. Rate Increases for Over-Allocation Use: This approach entails adopting higher rates for over-allocation use, and would be linked to purchases of imported water at Metropolitan's penalty rates, among other things.

These three types of allocation adjustments can be established and refined based on customer response in such a way that specified uses are discouraged. The allocations can be established in such a way that

certain uses are not included in the allocation. Customers engaging in these uses would receive over-allocation tier charges on their water bill.

In Levels One and Two, a combination of adjusting the tier thresholds and/or the allocations, as necessary, is likely to be sufficient to achieve the required demand reductions. In Levels Three and Four, those strategies, plus the use of rate increases with stronger price signals for over-allocation use, could be used to achieve further demand reductions. In all cases, adjustments to the allocations, tiers and rates will be at the discretion of the Board, and will be based on an assessment of the supply shortage, customer response and need for demand reductions.

Enforcement Mechanism:
Application of any or a combination of the allocation adjustment strategies will place customers into the higher usage tiers, which acts as a reporting and enforcement mechanism by creating a strong financial incentive for customers to reduce demands. The higher rates for above allocation use reflect and incorporate the cost of additional demand management measures, as well as the additional cost to IRWD of acquiring water supplies in a shortage.

Response Measures: Mandatory

Extreme shortage conditions (severe Level Three and Level Four) may require that the District adopt restrictions and/or ration water for health and safety purposes only. A system outage requires a rapid response based on the fact that there is typically a need for more immediate action to deal with an emergency situation. In a system outage emergency, the IRWD Board of Directors will declare a shortage based upon the projected impact of the system outage. Since adjustments to tiers and allocations typically have a time lag in implementation and effect, those measures will be of limited usefulness in a system outage. Therefore, in addition to the measures always in effect, the Board may impose any combination of the following mandatory measures and rationing to alleviate demands.

1. *Potable Irrigation Ban*: Outdoor irrigation would be the initial target for any demand reductions. Demand reductions or eliminations that cannot be met through voluntary measures and financial incentives related to adjustments in the allocation based rate structure, would be attained through a ban on potable irrigation. Table 4 indicates the potential demand reductions that could be

attained from 30%, 60% and complete elimination of outdoor irrigation. This includes dedicated landscapes, mixed use commercial accounts and residential outdoor irrigation.

Table 4: Potential Water Savings (AF) Based on Irrigation Cutbacks:

% Irrigation Cutback	**30%**	**60%**	**100%**
Potable Irrigation	8,980	17,959	29,932
Untreated Irrigation	351	701	1,169
Total	9,330	18,660	31,101

2. *Ban on car-washing and pool-filling:* Demand reductions on car-washing and pool filling that cannot be achieved through voluntary measures and financial incentives related to adjustments in the allocation-based rate structure would be attained through a ban on these actions.

Enforcement Measures

1. *Flow restrictors:* Under extreme conditions of noncompliance, the District could install flow restrictors in individual service lines. Thus, water would be available for drinking, cooking, sponge baths, and slow fill of toilet tanks, but showers and other high volume type uses would not be possible. Under these conditions individual customer reaction would be severe. It would probably be necessary to augment the customer service field service staff to maintain surveillance of these services to assure that unauthorized changes are not made by the customer.

2. *Mandatory Restrictions and Fines:* The District's ability to establish restrictions on water use and to possibly discontinue non-health and safety related service in the case of repeat violators is provided for under the Water Code of the State of California Chapters 3 and 3.5).

PART III: SHORTAGE RESPONSE PLAN

IRWD Water Supply Shortage Levels

In the event of a shortage, IRWD's Board of Directors, in accordance with the provisions of the California Water Code, will determine and declare the shortage level based on an assessment of the available supplies and demands, and may adjust the measures applied based on response in order to achieve the appropriate level of reduction. The following are the levels of shortage which may be declared; the approximate ranges of conditions the levels represent; and the reductions to be achieved:

Level One (Shortage Warning - up to 10% shortage):

Measures selected would be designed to achieve the following objectives:

Objectives:

- Public awareness of water supply situation and conservation opportunities
- Encourage diligent repair of water leaks
- Reduce over-allocation use
- Reduce outdoor over-irrigation

Measures: The measures used in Level One are primarily voluntary actions that modify customer behavior resulting from an enhanced public awareness campaign. In addition, increased outreach targeted toward over-allocation customers to help them identify the source of their overuse, and correct the problem should be sufficient to meet the objectives in Level One.

Costs and Outcomes: Based on 2007 data, a supply shortage of 10% represents approximately 6,600 AF. Information from the 2007 Annual Usage and Tier Break-Down presented in Appendix A indicates that over allocation use (sum of usage in tiers 3-5) accounts for approximately 4,200 AF of non-recycled water usage. Therefore, reducing the over-allocation use, combined with a strong public awareness campaign is expected to be sufficient to achieve the necessary reductions in Level One. The cost to implement voluntary responses is minimal, especially considering the return in reduced demand on the investment. None of the recommended steps would be difficult to implement or administer. The District has the basic infrastructure to pursue most voluntary measures through the Public Affairs and Conservation Departments. However, the District may need to conduct training and adjust its staff resources to effectively provide additional outreach to high usage tier customers.

Level Two (Significant Shortage Condition - 10-25% shortage): Measures selected would be designed to incorporate the objectives listed under Level One, and achieve the following further reduction in use:
Objectives:

- Review of allocations and potential adjustments to reduce outdoor irrigation and agricultural uses by 30%, or a percentage to be specified in the shortage declaration, based on a supply and demand analysis.
- Discourage filling of fountains, pools and water features and other discretionary uses.

Measures: Use of allocation and tier threshold adjustments is expected to be sufficient to achieve the necessary demand reduction objectives in a Level Two shortage. Adjustments to the allocations would employ the demand management/allocation adjustment strategies described in Part II of the document (pages 8-9).

Costs and Outcomes: A Level Two shortage can be offset by voluntary public response and perhaps minimal additional measures, such as reducing water allocations for non-crucial water uses including irrigation demands. Again using the 2007 Annual Usage and Tier Break-Down in Appendix A, a 30% reduction in potable irrigation and agricultural use (potable and untreated) would reduce the demands by an additional 9,300 AF , which combined with the Level One measures would result in a reduction in total demand of approximately 25%. Currently, there are some agricultural users using treated water within IRWD's service area. However, in the future, this demand is anticipated to decline to zero, in which case additional measures and adjustments to the allocations may be necessary to achieve the necessary Level 2 reductions. Depending on the duration and severity of the Level Two shortage, additional temporary staff in water conservation may be required to increase water awareness campaigns and assist customers with reduced irrigation allocations.

Level Three (Severe Shortage Condition - 25-40% shortage): Measures selected would be designed to incorporate the objectives listed under Level Two, and achieve the following further reduction in use.
Objectives:

- Further reductions in and/or eliminations of non-essential uses.
- Further reduce outdoor irrigation and agricultural uses by 60%, or a percentage to be specified in the shortage declaration, based on an analysis of supply and demand.
- Reduction in commercial, industrial and institutional use by 10%, or a percentage to be specified in the shortage declaration, based on an analysis of supply and demand.

- Elimination of specific municipal uses such as street cleaning, hydrant flushing, water-based recreation, etc.
- Activation of a District Task Force to investigate and consult with high-volume users (i.e. public authorities, universities, community associations, etc.) to assist in reducing the water demands of their properties.

Measures: Again, use of the demand management/allocation-based rate adjustment strategies described in Part II of this document (pages 8-9) will used as a key tool to achieve these objectives. For example, allocations can be reduced to minimize outdoor use and other discretionary uses by excluding those types of uses from the allocation. If necessary, higher rates for over-allocation use could also be adopted, at the discretion of the Board.

Costs and Outcomes: While it is difficult to precisely estimate the total reduction in demand that would be realized from the cumulative measures taken in Levels One, Two and Three, a Level Three shortage condition could entail significant adjustments to allocations and the implementation of mandatory measures to meet the District's reduction needs. In addition to increasing over-allocation tier charges, all common area landscape irrigation and agricultural irrigation should be reduced drastically, or eliminated completely if necessary by adjusting the water use allocations. Reduction of allocations of treated and untreated water serving irrigation (including residential landscapes) by 60% would reduce total demand by approximately 27% (see Appendix A: 2007 Annual Usage and Tier Break-Down). When one meter serves both internal use and landscaping, monitoring and public support would be needed to ensure that no irrigation takes place. An expanded irrigation group would be effective in these efforts. Untreated or recycled water use would only be reduced as needed based on the impact of reduced wastewater flows to recycled water production. Commercial, industrial and institutional customer allocations would be reduced by up to 10%.

Level Four (Crisis Shortage Condition - more than 40% shortage): Measures selected would be designed to incorporate the objectives listed under Level Three, and achieve the following further reductions in use:

Objectives:

- Cease all outdoor water uses for landscape and agriculture, subject to reserved rights relating to local wells.

Measures: A Level Four shortage would likely require further adjustments to allocations and the use of all the Demand Management/Allocation-Based Rates strategies described in Part II (pages 8-9) at the discretion of the Board. In addition, the Board may determine that it is necessary to use mandatory restrictions and possible discontinuation of non-health and safety related service in order to achieve the necessary demand reductions in a Level Four shortage.

Costs and Outcomes: If over-allocation charges had been previously avoided, this tool would almost certainly be needed at this level of supply deficiencies. Increasing the over-allocation tier charge, formulated upon projected penalty charges imposed by outside supply agencies, could be added to the allocation-based tiered rate structure, sufficient to encourage demand reduction to required levels, pay for an equivalent water conservation project designed to meet the required reduction in demands and provide a source of revenue to purchase additional supplies at penalty rates. Over-allocation usage tier charges would also offset the additional administrative and implementation costs to the district including increased staffing to address shortages and enhancement and expansion of the District's water conservation programs and projects.

Appendix A

2007 Annual Treated and Untreated Water Usage

and Tier Break-Down

USER DECRIPTION	TOTAL (AFY)	Allocation Tier (AFY) 1	2	3	4	5
AG-TREATED	975	975	0	0	0	0
AG-UNTREATED	6,669	6,669	0	0	0	0
COMM-TREATED	8,431	8,153	163	114		0
COMM-UNTREATED	9	9	0	0	0	0
CONSTRUCTION	882	882	0	0	0	0
INDUST-TREATED	5,273	5,034	50	32	156	0
LAKE	141	141	0	0	0	0
IRRIG-TREATED	6,313	4,442	1,450	81	60	280
IRRIG-UNTREATED	1,164	647	396	22	16	83
MULTI-RESIDENTIAL	10,681	6,608	3,473	425	93	82
PUBLIC AUTHORITY-TREATED	2,652	2,463	26	21	142	0
SINGLE-RESIDENTIAL	23,537	13,138	7,784	1,878	450	287
TOTAL Acre-Feet	**66,731**	**49,166**	**13,341**	**2,575**	**917**	**733**
Percentage	**100%**	**75%**	**20%**	**4%**	**2%**	**1%**

APPENDIX H: Resolution No. 2014-64 Water Shortage Contingency Plan

Irvine Ranch Water District
Urban Water Management Plan

RESOLUTION NO. 2014- 46

RESOLUTION OF THE BOARD OF DIRECTORS OF
IRVINE RANCH WATER DISTRICT ADOPTING
AMENDED WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, California law, as set forth in Government Code Section 10632, requires each urban water supplier's urban water management plan (UWMP) to provide a water shortage contingency analysis including specified elements; and

WHEREAS, Irvine Ranch Water District ("IRWD") initially adopted its Water Shortage Contingency Plan (the "Plan") in 1987, through the adoption of Resolution No. 1987-52 amending Section 15 – "Prohibition of Water Wastage" of IRWD's Rules and Regulations (as currently titled, "Rules and Regulations For Water, Sewer, and Recycled Water and Natural Treatment System Service" and referred to herein as the "Rules and Regulations"); and

WHEREAS, the Plan has been included as an appendix to IRWD's UWMP, and, along with certain information in the UWMP, provides the water shortage contingency analysis elements set forth in Government Code Section 10632; and

WHEREAS, the Plan also serves as the resource and supporting document for the implementation of Section 15 of the Rules and Regulations, now entitled "Water Conservation and Water Supply Shortage Program and Regulations"; and

WHEREAS, the Plan has been updated periodically, through the current version adopted on February 9, 2009 to incorporate conforming revisions relating to the amendment of Section 15 of the Rules and Regulations; and

WHEREAS, the Board of Directors desires to further revise the Plan.

NOW, THEREFORE, THE BOARD OF DIRECTORS OF IRVINE RANCH WATER DISTRICT DOES HEREBY RESOLVE, DETERMINE AND ORDER AS FOLLOWS:

Section 1. The amended Irvine Ranch Water District Water Shortage Contingency Plan is hereby adopted.

Section 2. The amended Irvine Ranch Water District Water Shortage Contingency Plan shall serve as a supporting document as referenced in Section 15 of the Rules and Regulations and in the UWMP.

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//

ADOPTED, SIGNED and APPROVED this 13th day of October, 2014.

President, IRVINE RANCH WATER DISTRICT and of the Board of Directors thereof

Secretary, IRVINE RANCH WATER DISTRICT and of the Board of Directors thereof

APPROVED AS TO FORM:
BOWIE, ARNESON, WILES & GIANNONE
IRWD Legal Counsel

100614

STATE OF CALIFORNIA)
) SS.
COUNTY OF ORANGE)

I, Nancy Savedra, Assistant Secretary of the Board of Directors of Irvine Ranch Water District, do hereby certify that the foregoing Resolution was duly adopted by the Board of Directors of said District at a regular board meeting of said Board held on the 13th day of October 2014, and that it was so adopted by the following vote:

AYES:	DIRECTORS	LaMar, Matheis, Reinhart, and Swan
NOES:	DIRECTORS	None
ABSTAIN:	DIRECTORS	None
ABSENT:	DIRECTORS	Withers

(SEAL)

Assistant Secretary of IRVINE RANCH WATER DISTRICT
and of the Board of Directors thereof

STATE OF CALIFORNIA)
) SS.
COUNTY OF ORANGE)

I, Nancy Savedra, Assistant Secretary of the Board of Directors of Irvine Ranch Water District, do hereby certify that the above and foregoing is a full, true and correct copy of Resolution No. 2014-46 of said Board, and that the same has not been amended or repealed.

Dated: _____

Assistant Secretary of IRVINE RANCH WATER DISTRICT
and of the Board of Directors thereof

(SEAL)

APPENDIX I: CUWCC BMP Coverage Reports

Irvine Ranch Water District
Urban Water Management Plan

Reporting Unit: Irvine Ranch Water District
Signatory: Irvine Ranch Water District
RU Type: Retail

Welcome **Fiona Sanchez** | Logout
Role : Editor

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5 Traditional / FlexTrack
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GPCD

Review / Submit

Potable Water Sources

Online Help

☑ Form Complete

Submited to CUWCC 10/29/2015 2:50:15 PM

Form Status: Submitted

Service Area Population: 367,724

Copy from previous year | Save

Potable

Potable Water

Imported	AF/Year	Water Supply Type	Water Supply Description
Met/MWDOC	14,583.3	Surface	Treated Imported (minus exports) (WTRFLOCONSOL14, June14 G9)

Local Watershed	AF/Year	Water Supply Type	Water Supply Description
Wells	49,250.30	Groundwater	Treated Groundwater (WTRFLOCONSOL14, June14 G10)
Total: 49,250.30			

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Reporting Unit: Irvine Ranch Water District
Signatory: Irvine Ranch Water District
RU Type: Retail

Welcome **Fiona Sanchez** | Logout
Role: Editor

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Review / Submit

Non Potable Water Sources

Online Help

☑ Form Complete

Submited to CUWCC
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Form Status: Submitted

Service Area Population: 367,724

Copy from previous year | Save

Non Potable Water

Imported	AF/Year	Water Supply Type	Water Supply Description
ILP/SAC	7,924.8	Raw Water	Untreated (Y12&13 WTRFLCONSOL14, WTR PURCHASED)

Local Watershed	AF/Year	Water Supply Type	Water Supply Description
Non-Potable Wells & Recycled Water Supplement	5,535.80	Groundwater	non-potable & recycled (Y17, Y19, Y21 from WRTFLOCONSOL14, WTR PURCHASED)
Recycled Water	21,919.46	Recycled Non Potable	Recycled water (Y23 from WTRFLOCONSOL14, WTR PURCHASED)
Total: 27,455.26			

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Reporting Unit: Irvine Ranch Water District
Signatory: Irvine Ranch Water District
RU Type: Retail

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Review / Submit

Potable Water Uses

Online Help

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Form Status: Submitted

Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
Single-Family	55,617	22,379.60	0	0.00	TREATED UWT: 10,11,12,15,18,71
Multi-Family	34,377	11,337.49	0	0.00	TREATED UWT: 13,16,17,80,81,82,83
Commercial	4,999	8,759.10	0	0.00	TREATED UWT: 20,72
Industrial	851	4,876.60	0	0.00	TREATED UWT: 30
Institutional	292	2,410.30	0	0.00	TREATED UWT: 40
Dedicated Irrigation	1,833	5,675.30	0	0.00	TREATED UWT: 60,76
Agricultural	12	199.40	0	0.00	TREATED UWT: 66
Other	193	721.30	0	0.00	TREATED UWT: 50,75
Fire Lines	4,057	1.30	0	0.00	TREATED UWT: 90
		Total : 56,360.39		Total : 0.00	

Un-Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
Other		0.00	203	0.00	All customer classes plus IRWD facilities
		Total : 0.00		Total : 0.00	

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Reporting Unit: Irvine Ranch Water District
Signatory: Irvine Ranch Water District
RU Type: Retail

Welcome **Fiona Sanchez** | Logout
Role : Editor

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Review / Submit

Non Potable Water Uses

Online Help

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Form Status: Submitted

Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
Agricultural	11	2,073.87	0	0.00	UNTREATED AG UWT: 67,69
Industrial	4	38.67	0	0.00	RECYCLED UWT: 32,39
Other	8	108.07	0	0.00	RECYCLED CONSTRUCTION UWT: 51
Dedicated Irrigation	4,393	24,024.01	0	0.00	RECYCLED UWT: 62,63
Other	6	137.08	0	0.00	LAKE FILL UWT: 64
Single-Family	593	769.79	0	0.00	RECYCLED SF DEDICATED IRRIG UWT: 65
Agricultural	35	4,261.09	0	0.00	RECYCLED AG UWT: 68
Agricultural	76	323.65	0	0.00	ILP UNTREATED AG UWT: 61
Other	1	28.10	0	0.00	COMMERCIAL SCA WATER, 23
Commercial	61	305.12	0	0.00	RECYCLED UWT: 29
		Total : 32,069.45		Total : 0.00	

Un-Billed

Customer Type	Metered Accounts	Metered Water Delivered AF/Year	Un-Metered # Accounts	Un - metered Water Delivered AF/Year	Description
Other	0	0.00	0	0.00	Evaporation
		Total : 0.00		Total : 0.00	

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V4 - **Latest**

Reporting Unit: Irvine Ranch Water District
Signatory: Irvine Ranch Water District
RU Type: Retail

Welcome **Fiona Sanchez** | Logout
Role : Editor

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BMP 1.1 Operations Practices

Online Help

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☑ Form Complete

Form Status: Submitted

Conservation Coordinator

Conservation Coordinator Yes No N/A — ON TRACK

Contact Information

First Name	Amy
Last Name	McNulty
Title	Water Efficiency Manager
Phone	949-453-5634
Email	mcnulty@irwd.com

Water Waste Prevention

An agency MUST do at least one or more of the following six strategies; although water agencies are encouraged to do them all when possible.

☑ Option A: Describe (upload or provide an electronic link) the ordinances or terms of service adopted by your agency to meet the water waste prevention requirements of this BMP. — ON TRACK

Upload File

NA

URL

Describe Ordinance or Terms

135 characters remaining

IRWD's Water Shortage Contingency Plan, which includes measures always in effect, regardless of drought conditions.

☐ **Option B:** Describe (upload or provide an electronic link) any water waste prevention ordinances or requirements adopted by your local jurisdiction(s) or regulatory agencies within your service area.

Upload File

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V4 - **Latest**

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always in effect, regardless of drought conditions.

☐ **Option B:** Describe (upload or provide an electronic link) any water waste prevention ordinances or requirements adopted by your local jurisdiction(s) or regulatory agencies within your service area.

Upload File

NA

URL

Describe Ordinances or Requirements 250 characters remaining

☐ **Option C:** Describe (upload or provide an electronic link) any documentation of support for legislation or regulations that prohibit water waste.

Upload File

NA

URL

Describe the support provided for legislation or regulations that prohibit water waste. 250 characters remaining

☐ **Option D:** Describe your agency's efforts to cooperate with other entities in the adoption or enforcement of local requirements consistent with this BMP.

Upload File

NA

Describe Efforts 250 characters remaining

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☐ **Option E:** Describe your agency's support positions with respect to adoption of legislation and/or regulations that are consistent with this BMP.

Upload File

NA

Describe Legislation

250 characters remaining

☐ **Option F:** Describe your agency's efforts to support local ordinances that establish permits requirements for water efficient design in new development.

Upload File

NA

Describe Legislation

250 characters remaining

At Least As Effective As

Is your agency implementing an "At Least As Effective As" variant of this BMP? ○ Yes ○ No ◉ N/A

If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 of the MOU and why you consider it to be "at least as effective as."

250 characters remaining

Please Upload Document(s)

NA

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☐ **Option F:** Describe your agency's efforts to support local ordinances that establish permits requirements for water efficient design in new development.

Upload File

NA

Describe Legislation — 250 characters remaining

At Least As Effective As

Is your agency implementing an "At Least As Effective As" variant of this BMP? ○ Yes ○ No ◉ N/A

If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 of the MOU and why you consider it to be "at least as effective as."

250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Exemption Type : Select an Exemption Type ▾

Please Upload Document(s) for Exemption

NA

Comments — 250 characters remaining

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BMP 1.2 Water Loss Control

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AWWA Water Audit

Agency to complete a water audit and balance using the AWWA software	Yes	No	N/A	ON TRACK
Upload Worksheets (AWWA Water Audit)				
Uploaded filename: Copy_of_2014_Reporting_Sheet.xls				ON TRACK
Water Audit Validity Score 84				
Agency Completed Training In The AWWA Water Audit Method	Yes	No	N/A	ON TRACK
Agency Completed Training In The Component Analysis Process	Yes	No	N/A	ON TRACK
Completed/Updated the Component Analysis (at least every 4 years) (Effective from 2013)	Yes	No	N/A	ON TRACK
Component Analysis Completed/Updated Date: 08/26/2015 format:mm/dd/yyyy				

Water Loss Performance

Agency repaired all reported leaks & breaks to the extent cost effective	Yes	No	N/A	ON TRACK

Recording Keeping Requirements Beginning in Year 2

Does your agency maintain a record keeping system for the following?

Date/Time Leak Reported	Yes	No	N/A	Leak Location	Yes	No	N/A
Type of Leaking Pipe Segment or Fitting	Yes	No	N/A	Leak Running Time From Report to Repair	Yes	No	N/A
Leak Volume Estimate :	Yes	No	N/A	Cost of Repair:	Yes	No	N/A
Do you have an infrastructure rehabilitation and renewal program ?	Yes	No	N/A				

Agency Located and Repaired Unreported Leaks to the Extent Cost

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Total Leaks Repaired	Economic Value Of RealLoss	Economic Value Of AppLoss	Miles Of System Surveyed For Leaks	Pressure Reduction Undertaken for loss reduction	Cost Of Intervention	Linear feet of pipe renewal and rehabilitation	Water Saved (AF/Year)
48	1,766,414.7	1,479,654	1,617.20		288,000.00		179.00

Please describe your infrastructure rehabilitation and renewal activity below — 250 characters remaining

AWWA Model

Operational Efficiency Indicator

Apparent Losses per service connection per day:	0.00
Real Losses per service connection per day:	0.00
Real Losses per length of main per day:	0.00
Real Losses per service connection per day per psi pressure:	0.00
Unavoidable Annual Real Losses(UARL):	0.00
Above, Real Losses=Current Annual Real Losses(CARL):	0.00
Infrastructure Leakage Index (ILI) [CARL/UARL]:	0.00
WATER SUPPLIED:	63627.32
Reporting Units:	

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? ○ Yes ○ No ◉ N/A

If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 of the MOU and why you consider it to be "at least as effective as."

250 characters remaining

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Signatory: Irvine Ranch Water District
RU Type: Retail

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Provisional Coverage Indication ON TRACK

BMP 1.3 Metering with Commodity Rates Online Help

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☑ Form Complete Form Status: Submitted

Implementation

ON TRACK

Does your agency have any unmetered service connections? Yes No N/A

If YES, has your agency completed a meter retrofit plan? Yes No N/A

If YES, number of previously unmetered accounts fitted with meters during reporting year:

ON TRACK

Are all new service connections being metered? Yes No N/A

Are all new service connections being billed volumetrically? Yes No N/A

ON TRACK

Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? Yes No N/A

NA

Please Fill Out The Following Matrix

Account Type	# Metered Accounts	# Metered Accounts Read	# Metered Accounts Billed by Volume	Billing Frequency Per Year	# Estimated Bills/Year	# Of Meter Readings per Year
Single-Family	55,617.00	55,617.00	55,617.00	Monthly	0.00	0.00
Multi-Family	34,377.00	34,377.00	34,377.00	Monthly	0.00	0.00
Commercial	4,999.00	4,999.00	4,999.00	Monthly	0.00	0.00
Industrial	851.00	851.00	851.00	Monthly	0.00	0.00
Institutional	292.00	292.00	292.00	Monthly	0.00	0.00
Dedicated Irrigation	1,833.00	1,833.00	1,833.00	Monthly	0.00	0.00

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Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters? Yes No N/A

NA

Please Fill Out The Following Matrix

Account Type	# Metered Accounts	# Metered Accounts Read	# Metered Accounts Billed by Volume	Billing Frequency Per Year	# Estimated Bills/Year	# Of Meter Readings per Year
Multi-Family	34,377.00	34,377.00	34,377.00	Monthly	0.00	0.00
Commercial	4,999.00	4,999.00	4,999.00	Monthly	0.00	0.00
Industrial	851.00	851.00	851.00	Monthly	0.00	0.00
Institutional	292.00	292.00	292.00	Monthly	0.00	0.00
Dedicated Irrigation	1,833.00	1,833.00	1,833.00	Monthly	0.00	0.00
Agricultural	12.00	12.00	12.00	Monthly	0.00	0.00
Fire Lines	4,057.00	4,057.00	4,057.00	Monthly	0.00	0.00
Other	203.00		203.00	Monthly	0.00	0.00

Number of CII Accounts with Mixed-used Meters: 670
Number of CII Accounts with Mixed-used Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period: 0

Feasibility Study

ON TRACK

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? Yes No N/A

If YES, please fill in the following information:

A. When was the Feasiblity Study conducted: 06/01/2012

B. Describe, upload or provide an electronic link to the Feasibility Study Upload File

NA

URL

Describe 250 characters remaining

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Review / Submit

Number of CII Accounts with Mixed-used Meters Retrofitted with Dedicated Irrigation Meters during Reporting Period: 0

Feasibility Study — ON TRACK

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? Yes No N/A

If YES, please fill in the following information:

A. When was the Feasiblity Study conducted: 06/01/2012

B. Describe, upload or provide an electronic link to the Feasibility Study Upload File

NA

URL

Describe — 250 characters remaining

At Least As Effective As

Is your agency implementing an "at least as effective as" variant of this BMP? Yes No N/A

If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 of the MOU and why you consider it to be "at least as effective as."

250 characters remaining

Please Upload Document(s)

NA

Exemption Type

Select an Exemption Type ▾

Please Upload Document(s) for Exemption

NA

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Review / Submit

Provisional Coverage Indication NOT ON TRACK

BMP 1.4 Retail Conservation Pricing

Online Help

Submited to CUWCC
10/29/2015 2:50:15 PM

☑ Form Complete

Form Status: Submitted

A. Implementation (Water Rate Structure)

Enter the Water Rate Structures that are assigned to the majority of your customers, by customer class.

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges	New
No data to display				
		$0.00	$0.00	

B. Implementation Options (Compliance with Conservation Pricing Options (Water))

Please Select an Option

Option 1: Annual Revenue As Reported Option 2: Canadian Water Wastewater Assn Rate Design Model

Use 3 years average instead of most recent year

If CWWA is selected, please upload spreadsheet here.

NA

Canadian Water & Wastewater Association Rate Design Model Implementation

C. Canadian Water & Wastewater Association

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges
No data to display			
		$0.00	$0.00

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Review / Submit

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges
No data to display			
		$0.00	$0.00

D. Retail Waste Water (Sewer) Rate Structure by Customer Class

Does your agency provide sewer service? Yes No N/A

Select the Retail Waste Water (Sewer) Rate Structure assigned to the majority of your customers within a specific customer class.

Rate Structure Option	Customer Class Name	Total Revenue Commodity Charges	Total Revenue Customer Meter/Service (Fixed) Charges
No data to display			
		$0.00	$0.00

Option 3: Click here to use option 3 and/or to report your Agency's good faith efforts - redirects to new page

At Least As Effective As

Agency is implementing an 'At Least As Effective As' variant of this BMP? Yes No N/A

If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 of the MOU and why you consider it to be "at least as effective as."

250 characters remaining

Please Upload Document(s)

NA

Exemption Request

If agency has requested an exemption then please select a exemption type.

Exemption Type * Select an Exemption Type ▾

Please Upload Document(s)

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Agency's name: Irvine Ranch Water District **Reporting year: 2014**

BMP 1.4, Part I, option 3 summary

Total Points Section 1	Total Points Section 2	Total Points Section 3	TOTAL POINTS
20.00	23	6	49.00

Select a page to Edit or Review:

Water Rate Option 3, Section 1 (http://www.cuwcc.org/Intranet/BMP-14-Option-3-section-1/ruID/136/year/2014)
Water Rate Option 3, Section 2 (http://www.cuwcc.org/Intranet/BMP-14-Option-3-section-2/ruID/136/year/2014)
Water Rate Option 3, Section 3 (http://www.cuwcc.org/Intranet/BMP-14-Option-3-section-3/ruID/136/year/2014)
Waste Water Service Provider Info (http://www.cuwcc.org/Intranet/BMP-14-Sewer-Providers/ruID/136/year/2014)
Help page (http://www.cuwcc.org/Intranet/BMP-14-Help)
Water Volume calculator (http://www.cuwcc.org/Intranet/Water-Volume-calculator)

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Provisional Coverage Indication ON TRACK

BMP 2.1 Public Information Programs

Online Help

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10/29/2015 2:50:15 PM

☑ Form Complete

Form Status: Submitted

Are there one or more wholesale agencies performing public outreach which can be counted to help your agency comply with the BMP? Yes No N/A

If "Yes" please select council wholesale agencies;

☐ Municipal Water District of Orange County

Please provide the name of agency , contact name and email address if not A Council Group 1 member.

200 characters remaining

Report a minimum of four water conservation related contacts your agency had with the public during the year.

ON TRACK

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
19	Newsletter articles on conservation
11	General water conservation information
1,500	Flyers and/or brochures (total copies), bill stuffers, messages printed on bill, information packets
27	Website
1,557	

Contact with the Media

Yes No N/A

ON TRACK

Media Contacts List

Did at least one contact take place during each quarter of the reporting year? ☐

Number of Media Contacts	Media Contacts Type
No data to display	

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Did at least one contact take place during each quarter of the reporting year? ☐

Number of Media Contacts	Media Contacts Type
No data to display	

Agency Website Updates

238 characters remaining

Enter your agency's URL (website address): www.irwd.com

37 characters remaining

Describe a minimum of four water conservation related updates to your agency's website that took place during the year: Liquid News blog, updates on conservation programs (monthly) updates on rebate information (quarterly) updates on events, classes and workshops (monthly) Home Page sliders touting conservation programs (quarterly)

Did at least one website update take place during each quarter of the reporting year? Yes No N/A

ON TRACK

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.

Category	Amount	Personnel Costs Included?	Comments
Print Materials	42,000.00		
Advertising	1,000.00		
Conservation Devices	40,500.00		
Event Promotion and Planning	3,000.00		
Residential Tours	4,000.00		
	$90,500.00		

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. For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

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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. For example, if you included personnel costs in the budget entered above, be sure to include them here as well.

Expense Category	Expense Amount	Personnel Costs Included?
No data to display		
	$0.00	

ALL DATA BELOW ARE OPTIONAL

Additional Public Information Program

You may report additional public information contacts. Please 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 No N/A

Public Outreach Additional Information

Public Information Programs	Importance
No data to display	

Social Marketing Programs

Branding

Does your agency have a water conservation "brand," "theme" or mascot? Yes No N/A

181 characters remaining

Describe the brand, theme or mascot.

RightScape: The Right Plants, The Right Schedule, The Right Equipment

Market Research

Have you sponsored or participated in market research to refine your message? Yes No N/A

100 characters remaining

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Review / Submit

refine your message?

Market Research Topic	100 characters remaining
Brand Message	100 characters remaining
Brand Mission Statement	100 characters remaining

Community Committees

Do you have a community conservation committee? Yes No N/A

Enter the names of Community Committees: 100 characters remaining

Training

Training Type	# of Trainings	# of Attendees	Description of Other
No data to display			

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description
Advertising	1,000.00	Social Media Advertising, YouTube video development

Partnering Programs

Name	Type of Program
☐ CLCA?	
☐ Green Building Programs?	
☑ Master Gardeners?	UCCE Master Gardeners of Orange County
☑ Cooperative Extension?	UCI Cooperative Extension Center
☐ Local Colleges?	
☑ Other	Sea and Sage Audubon Society, Discovery Science Center

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Training

Training Type	# of Trainings	# of Attendees	Description of Other
No data to display			

Social Marketing Expenditures

Public Outreach Social Marketing Expenses

Expense Category	Expense Amount	Description
Advertising	1,000.00	Social Media Advertising, YouTube video development

Partnering Programs

	Name	Type of Program
☐ CLCA?		
☐ Green Building Programs?		
☑ Master Gardeners?	UCCE Master Gardeners of Orange County	
☑ Cooperative Extension?	UCI Cooperative Extension Center	
☐ Local Colleges?		
☑ Other	Sea and Sage Audubon Society, Discovery Science Center	
☑ Retail and wholesale outlet; name(s) and type(s) of programs:		
Home Depot	RightScape Garden Events	

Partnering Programs - Newsletters

Number of newsletters per year	12
Number of customers reached per year	

Partnering with Other Utilities

250 characters remaining

Describe other utilities your agency partners with, including electrical utilities

Conservation Gardens

250 characters remaining

Describe water conservation gardens at your agency or other high traffic areas or new homes.

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Reporting Unit: Irvine Ranch Water District
Signatory: Irvine Ranch Water District
RU Type: Retail

Welcome **Fiona Sanchez** | Logout
Role: Editor

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Review / Submit

Provisional Coverage Indication ON TRACK

BMP 2.2 School Education Programs, Retail Agencies Online Help

Submited to CUWCC
10/29/2015 2:50:15 PM

☑ Form Complete Form Status: Submitted

Does your agency implement a school education program? Yes No N/A

Are there one or more wholesale agencies performing school education programs which can be counted to help your agency comply with the BMP?
Municipal Water District of Orange County ☐

Please provide the name of Agency, contact name and email address if not CUWCC Group 1 members.

ON TRACK

☑ Materials meet state education framework requirements.

Description: 178 characters remaining
Grade specific workbooks, electronic key pad systems, kits and devices.

ON TRACK

☑ Materials distributed to K-6 students.

Description of materials distributed to K-6 students: 178 characters remaining
Grade specific workbooks, electronic key pad systems, kits and devices.

Number of student reached. 9423

☑ Materials distributed to 7-12 students. (optional)

Description of materials distributed to 7-12 students 179 characters remaining
Workbooks, nitrate testing kits during field trips, conservation kits.

Annual budget for school education program. ON TRACK

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V4 - **Latest**

Reporting Unit: Irvine Ranch Water District
Signatory: Irvine Ranch Water District
RU Type: Retail

Welcome **Fiona Sanchez** | Logout
Role: Editor

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12 students remaining

Workbooks, nitrate testing kits during field trips, conservation kits.

Annual budget for school education program.

ON TRACK

$ 149685.00

ON TRACK

172 characters remaining

Description of all other water supplier education programs.

Tours, field trips, festivals, science fairs, poster contests, and Project WET

School Program Activities

Classroom presentations:

Number of presentations	Number of attendees
37	1208

219 characters remaining

Describe the topics covered in your classroom presentations:

Conservation and water sources

Large group assemblies:

Number of presentations	Number of attendees
120	8215

Children's water festivals or other events:

Number of presentations	Number of attendees
12	300

Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentations	Number of attendees
2	20

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description	250 characters remaining	Number distributed

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V4 - **Latest**

Reporting Unit: Irvine Ranch Water District
Signatory: Irvine Ranch Water District
RU Type: Retail

Welcome **Fiona Sanchez** | Logout
Role : Editor

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Cooperative efforts with existing science/water education programs (various workshops, science fair awards or judging) and follow-up:

Number of presentations: 2
Number of attendees: 20

Other methods of disseminating information (i.e. themed age-appropriate classroom loaner kits):

Description (250 characters remaining)
Number distributed

Staffing children's booths at events and festivals:

Number of booths: 2
Number of attendees: 1000

Water conservation contests such as poster and photo:

Description (249 characters remaining): 2
Number of Participants: 10

Offer monetary awards/funding or scholarships awards to students:

Number offered: 5
Total funding: 500.00

Teacher training workshops:

Number of presentations
Number of attendees

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or field trips: 21
Number of participants: 1208

College internships in water conservation offered:

Number of internships
Total funding

Career fair/workshops:

Number of presentations: 2
Number of attendees: 30

Additional program(s) supported by agency:

Not mentioned above
250 characters remaining
Number of events (if applicable)
Number of participants

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Reporting Unit: Irvine Ranch Water District
Signatory: Irvine Ranch Water District
RU Type: Retail

Welcome **Fiona Sanchez** | Logout
Role : Editor

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Water conservation contests such as poster and photo:

Description — 249 characters remaining: 2
Number of Participants: 10

Offer monetary awards/funding or scholarships awards to students:

Number offered: 5
Total funding: 500.00

Teacher training workshops:

Number of presentations:
Number of attendees:

Fund and/or staff student field trips to treatment facilities, recycling facilities, water conservation gardens, etc.:

Number of tours or field trips: 21
Number of participants: 1208

College internships in water conservation offered:

Number of internships:
Total funding:

Career fair/workshops:

Number of presentations: 2
Number of attendees: 30

Additional program(s) supported by agency:

Not mentioned above
250 characters remaining

Number of events (if applicable):
Number of participants:

Total reporting period budget expenditures for school education programs (include all agency costs):

At Least As Effective As

Is your Agency implementing an "At Least As Effective As" Variant of this BMP? ○ Yes ○ No ◉ N/A

If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 of the MOU and why you consider it to be "at least as effective as."

150 characters remaining

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Review / Submit

Provisional Coverage Indication

GPCD Coverage Calculations

Online Help

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10/29/2015 2:50:15 PM

☑ Form Complete

Calculate | Save

Instructions | Hints and Tips | Main Data | Population | Indirect Recycled Water | GPCD Matrix | Landscape Area Wateruse | Baseline CII | Targets (CUWCC MOU) | Targets (SBx7_7)

Would you like to use Weather Normalization (WN) adjustments? ○ Yes ◉ No

Do you accept the Council's default calculations? ◉ Yes ○ No

GPCD in 2006 ○	180.4	With WN	0	GPCD in 2014	151.89	With WN	0
Baseline GPCD (1997 to 2006) ◉	191.91	With WN	0	GPCD Target for 2018	157.4	With WN	0

Biennial GPCD Coverage Table

Year	Report	Target		Highest Acceptable Bound for WN option	
		% Base	GPCD	% Base	GPCD
2010	1	96.4%	185	100%	191.9
2011 [1]	2	94.6%	181.5	98.2%	188.5
2012	2	92.8%	178.1	96.4%	185
2013 [1]	3	91%	174.6	94.6%	181.5
2014	3	89.2%	171.2	92.8%	178.1
2015 [1]	4	87.4%	167.7	91%	174.6
2016	4	85.6%	164.3	89.2%	171.2
2017 [1]	5	83.8%	160.8	85.6%	164.3
2018	5	82.0%	181.5	82.0%	157.4

1 Interim odd year targets are shown for USBR Contractors

Potable Water GPCD for each Year in the Baseline Period

Year	GPCD	GPCD W. WN
2006	180.4	0
2005	171.71	0
2004	187.66	0
2003	180.03	0
2002	187.64	0
2001	204.43	0
2000	201.82	0
1999	201.4	0
1998	191.52	0
1997	212.46	0

TARGETS/COMPLIANCE (SBx7-7)

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