2005 URBAN WATER MANAGEMENT PLAN

Irvine Ranch Water District
15600 Sand Canyon Avenue
Irvine, CA 92618

NOVEMBER 2005

IRVINE RANCH WATER DISTRICT

2005 URBAN WATER MANAGEMENT PLAN
CONTACT SHEET

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The water supplier is a	Special District
The water supplier is a	Retailer
Utility services provided by the water supplier	Water, sewer, recycled water
Is this agency a Bureau of Reclamation Contractor?	No
Is the Agency a State Water Project Contractor?	No

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2) California Urban Water Management Planning Act

Appendix B……..List of Reference Documents

Appendix C……..Letters to Cities and County within the Irvine Ranch Water District Service Area

Appendix D…….. Best Management Practices Annual Reports 2003-2004

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Appendix F…..…..…..1) IRWD Resolution No. 1987-52
2) Water Shortage Contingency Plan

Law

> 10617 "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually.
>
> 10620 (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).
>
> 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.

Irvine Ranch Water District ("IRWD", "District") is a multi-service agency responsible for providing domestic water service, sewage collection, advanced wastewater treatment and water recycling for a 133-square mile service area in south central Orange County. IRWD provides water service to approximately 316,000 county residents.

This Urban Water Management Plan (UWMP) 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. The sections of this UWMP correspond to the outline of the Act, specifically Articles 2, 2.5 and 3 (Appendix A). Several sources of information were referenced in preparation of this UWMP as listed under Appendix B and are referred to throughout the UWMP.

I. Agency Coordination

A. Coordination with Appropriate Agencies (§ 10620(d))

IRWD is the largest constituent agency of the Municipal Water District of Orange County (MWDOC). MWDOC is a member agency of the Metropolitan Water District of Southern California (MWD), the regional imported water wholesaler. MWDOC serves all of Orange County except for the cities of Anaheim, Fullerton and Santa Ana. IRWD coordinated the development of this UWMP with MWDOC. In accordance with the Act, IRWD provided its imported water needs (demands) to MWDOC and MWDOC and MWD have documented available imported supplies for retailers in their respective Regional Urban Water Management Plans (RUWMP). References are made in a more general aspect to the RUWMPs prepared by both the MWD and MWDOC.

Table 1 shows IRWD's UWMP coordination with appropriate agencies.

Table 1
Coordination with Appropriate Agencies

Agency	Participated in developing the plan	Contacted for assistance	Attended public meetings	Opportunity to comment on the draft	Sent notice of public hearing
MWD		X		X	X
MWDOC	X	X	X	X	X
City of Irvine		X		X	X
City of Tustin		X		X	X
City of Lake Forest		X		X	X
City of Newport Beach		X		X	X
City of Orange		X		X	X
City of Costa Mesa		X		X	X
County of Orange		X		X	X
Santa Margarita Water District				X	X
Orange County WD				X	X
The Irvine Company				X	X

B. UWMP Preparation (§ 10620(e))

IRWD's staff prepared the 2005 UWMP in coordination with the other agencies as indicated in Table 1. In preparing the UWMP, IRWD staff utilized the *Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan* prepared by the California Department of Water Resources.

C. Water Management Tools (§ 10620(f))

IRWD's principal water management planning tool is its "Water Resources Master Plan" ("WRMP") which describes both the potable and non-potable systems and provides a basis for future IRWD water resource planning [1]. The WRMP is a comprehensive document compiling data and analysis, including current and future land uses, which IRWD considers necessary for its planning needs. The WRMP provides identification of an optimum mix of water recourses to meet normal and emergency requirements prioritizing local supplies vs. imported supplies. As a submember agency of MWD, IRWD is aware of future challenges with imported water and it is within this context that IRWD's future water resource development plan has been fashioned. For many years, IRWD's potable water system relied on imported water supplies from MWD; however, in an effort to increase local supplies IRWD developed the Dyer Road Wellfield. To further offset the need for imported water for non-potable uses, IRWD expanded its recycled

water program to meet future non-potable demands. IRWD utilizes its WRMP to implement its water resources program, which puts emphasis and planning on maximizing local supplies to meet demands through increased recycled water use, increased groundwater development, groundwater treatment, and investigating supplemental supply options such as groundwater banking. The WRMP describes IRWD's plans to reduce reliance on imported supplies including assumptions to maximize groundwater development, full expansion of IRWD's Michelson Water Reclamation Plant to 33 mgd treatment capacity or larger as required; and the conversion of the San Joaquin Reservoir to an IRWD recycled water seasonal storage reservoir, which was recently completed in 2005.

D. Plan Updated in Years Ending in Five and Zero (§ 10621(a))

IRWD's 2005 Urban Water Management Plan was prepared in accordance with the requirement under the Act that urban water purveyors submit a UWMP to the Department of Water Resources addressing water supply and demands, conservation measures, and water recycling among other things. IRWD prepared previous UWMPs in 1985, 1990, 1995 and 2000. Several legislative amendments have been made to the Act since IRWD's last submission of 2000 and this UWMP update incorporates all of the new requirements.

Senate Bills 610 and 221

The passage of Senate Bills 610 and 221 in 2002 required additional information be included in the UWMP and also identified the UWMP as a source document that may be used by water agencies to fulfill the water supply assessment and verification requirements. The UWMP Act requires a 20-year projection (through 2025 for the 2005 UWMP) for supply and demand information required in the UWMP. Some water agencies preparing an assessment or verification between 2006 and 2010 will utilize the UWMP data to comply with these requests and therefore provide data to the year 2030. IRWD, however, prepares separate water supply assessments and verifications based upon its principle planning document, the Water Resources Master Plan. Although not required, IRWD included supply and demand data to the year 2030 in this 2005 UWMP.

E. City and County Notification and Participation (§ 10621(b))

During the preparation of the UWMP, IRWD notified all of the cities within IRWD's service area and the County of Orange of the opportunity to submit comments regarding the UWMP during the update process. IRWD received a letter from the County of Orange (see copy under Appendix C) which provided planning information for IRWD's unincorporated areas. IRWD acknowledged receipt of the letter and noted the information was previously incorporated into

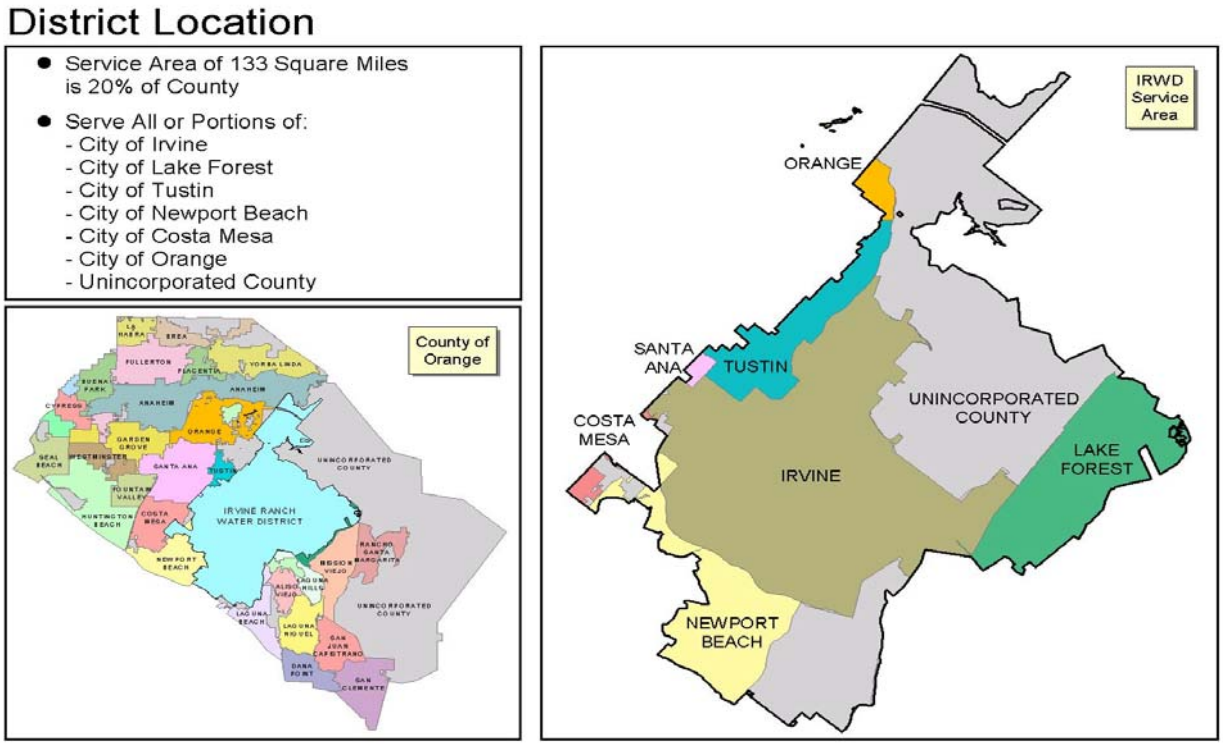
IRWD's demand projections. As indicated in Table 1 above, IRWD sent draft UWMPs to the cities and county, and provided notification of IRWD's public hearing (held on November 28, 2005) and opportunity for comments on the draft. Copies of all letters notifying the cities and county of Orange of IRWD's UWMP update process are included under Appendix C.

Law

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

II. Contents of UWMP

The Irvine Ranch Water District, a California Water District, was formed in 1961 and is located in the south central portion of Orange County. IRWD provides potable and non-potable water supply, wastewater collection, treatment and disposal, and wastewater reclamation. 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 133-square mile service area with an estimated population of 316,000.



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. IRWD's current records show approximately 92,800 connections serve approximately 56,000 acre-feet of potable water and 30,000 acre-feet of non-potable water annually.

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.

A. Population (§ 10631(a))

IRWD, once largely an agricultural community, is continuing to undergo municipal and industrial development with approximately 400 acres of vacant land and farmland being urbanized each year. IRWD's current population of 316,000 is approximately 73% of the ultimate projected population estimated at 434,511 for 2030. IRWD's population projections are shown in Table 2.

Table 2
IRWD Population Projections

	2005	2010	2015	2020	2025	2030
Service Area Population	316,000	366,192	384,502	403,727	423,914	434,511

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 most recent plan was issued in February 1996. 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 [1]. The major characteristic of IRWD's service area includes 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.

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 proposing to develop 950 acres (commercial and residential) of vacant land which is adjacent to the former Marine Corps Air Station at El Toro.

B. Climate (§ 10631(a))

IRWD's service areas have a generally mild and relatively uniform climate with an average rainfall of approximately 14.2 inches. Table 3 below shows average climate characteristics for the IRWD service area.

Table 3
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.

C. Other demographic factors (§ 10631(a))

Industrial and Commercial Activities
Industrial and commercial development within IRWD is concurrent with residential development. Again, 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 [1].

In late 2001, the Irvine Company (the major land owner in IRWD) 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 (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 calculations.

Institutional and Others

(1) University of California, Irvine and its inclusion area

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 24,100 with approximately 9,500 faculty and staff. There is a projected UCI build-out population of approximately 35,000 students and 14,000 faculty and staff. IRWD participates with UCI on its Subarea Master Planning to determine the effects of planned improvements on IRWD's water, reclamation and sewer systems.

(2) Marine Corps Air Stations, El Toro and Tustin

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 alternatives have been prepared for both bases and IRWD has prepared various levels of planning studies for these plans. For the Tustin base property, IRWD is relying on land use plans prepared by the City of Tustin as the redevelopment authority. The El Toro base property, formerly within the unincorporated County of Orange, was annexed to the City of Irvine and IRWD prepared and approved a water supply assessment (approved January 27, 2003) on the City's proposed land use plan for the base property.

D. Land Use and Water Resource Planning

The foundation for IRWD's WRMP is the compilation of land use data. For IRWD, this required interfacing with multiple jurisdictions and developing a land use database using GIS. Computerized GIS for the master planning process enables a more detailed categorization of residential land use by jurisdictional agency. Land use data was used in conjunction with updated water use factors to estimate water requirements through development of a "demand forecasting tool." Appropriate GIS layers were established to segregate demands for system and storage evaluations. These evaluations were based on system criteria, which were reviewed in detail and updated as part of the planning effort.

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 service area conducted as part of the WRMP.

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 [to 20 years or as far as data is available.]

E. Current and planned Water Supplies (§ 10631(b))

IRWD is a constituent agency of the MWDOC, a member agency and wholesale importer of water from MWD and, as such, is entitled to receive water from the available sources of MWD. Groundwater is used as an additional source of water and its use 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.

Table 4 below shows IRWD's variety of current and projected planned water supplies. The water supplies projected here do not represent the total supply capacity available to IRWD but rather the projected supplies to meet the projected demands.

Table 4
IRWD Current and Planned Water Supplies (AFY)

	2005	2010	2015	2020	2025	2030
Potable Supplies:						
Purchased MWD treated	19,306	25,318	31,508	35,477	37,395	38,161
Clear groundwater	29,960	28,000	28,000	28,000	28,000	28,000
Treated groundwater	7,200	22,988	25,066	27,306	29,459	29,753
Non-potable Supplies:						
Recycled water	15,296	26,203	26,091	27,948	29,231	29,523
Purchased MWD untreated	5,304	6,303	4,556	3,434	3,225	3,225
Native (surface water)	7,251	4,000	4,000	4,000	4,000	4,000
Non-potable groundwater	2,285	3,898	3,898	3,898	3,898	3,898
Total	86,602	116,710	123,119	130,063	135,208	136,560

Imported Water Supplies. Currently, approximately 34% of IRWD's potable water needs are met by water imported by MWD through MWDOC. 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 areas are the Allen-McColloch Pipeline (AMP) and East Orange County Feeder No. 2 (EOCF #2). IRWD owns 64.7 cfs capacity in the AMP, 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 (OCF) 18 cfs acquired through its consolidation with Santa Ana Heights Mutual Water Company. IRWD has over 124 cfs of connected capacity to MWD's system which is sufficient capacity to meet its potable demands. The MWD supplies listed in Table 4 do not represent the total supplies that could be delivered to IRWD through all of its connected capacities, but rather the supplies IRWD would most likely utilize to meet demands. IRWD prefers to diversify and rely less on imported and more on local supplies, and has therefore developed extensive groundwater pumping capacities to meet potable demands in addition to MWD supplies as discussed below under "Groundwater Sources".

Non-Potable Water Supplies. IRWD's non-potable water system meets the majority of the landscape irrigation and agricultural water demands. The sources of the non-potable system consist of recycled water, untreated imported water, surface water and low-quality groundwater.

Recycled Water. IRWD has an extensive dual distribution system, which delivers recycled water from the Michelson Water Reclamation Plant (MWRP) and the Los Alisos Water Reclamation Plant (LAWRP). The recycled water system currently serves agricultural and non-agricultural irrigation demands and other non-potable uses. The quality of wastewater effluent used for landscape irrigation and agriculture complies with Title 22, Division 4 of the California Administrative Code, Department of Health Services (DOHS). The MWRP has permitted treatment capacity of 18 mgd and LAWRP has permitted capacity of 7.5 mgd for secondary treatment and 5.5 mgd for recycled water production.

Untreated Imported Water. Untreated imported water is used primarily to meet agricultural demands and supplement landscape irrigation demands. Agricultural demands within IRWD are expected to reduce in future years as development occurs. The untreated water is imported from the MWD system. The Irvine Lake Pipeline (ILP) conveys MWD untreated water and local runoff from Irvine Lake to Lambert Reservoir (Irvine Company owned). Connections along the ILP serve Irvine Company irrigation system and the IRWD recycled water distribution system. IRWD owns 80.0 cfs in the ILP. The Baker Aqueduct also delivers MWD untreated water to central and south Orange County. Utilization of the Baker Pipeline has reduced due to the use of AMP and decline of area agriculture. IRWD's capacity in the Baker Pipeline includes the capacity it subleases as successor to LAWD, as well as capacity rights IRWD acquired. IRWD has 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 Baker Pipeline.

Native Surface Water. An average of about 8,000 AFY of Santiago Creek local runoff is captured in the Irvine Lake. IRWD and Serrano Water District have the right to 28,000 AY from the Lake under license. Since the base flow from the catchment is very low, the annual yield from the reservoir may be extreme, from a few hundred acre-feet per year to overflow conditions. On average, IRWD uses about 4,000 AFY for agricultural irrigation and the remainder is treated for domestic use by Serrano Water District, which owns 25% of the capacity in the Irvine Lake. During single or multiple dry years, IRWD's annual use of local runoff is about 1,000 AFY.

F. Groundwater Sources (§ 10631(b)(1)-(2))

Orange County Groundwater Basin

The source of IRWD's groundwater supply is the Lower Santa Ana River Basin. IRWD is an operator of groundwater-producing facilities in the Orange County Groundwater Basin ("Basin"). Although the rights of the producers within the Basin vis a vis one another have not been adjudicated, they nevertheless exist and have not been abrogated by the Orange County Water District Act, Water Code App., Ch 40 ("Act"). The rights consist of municipal appropriators' rights and may include overlying and riparian rights.

The Basin is managed solely by the Orange County Water District (OCWD) under the Act and is described at pages 3-1 through 3-14 of the OCWD Master Plan Report, dated April 1999 ("MPR") [4]. 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. Current groundwater production from the Basin was 336,789 AF for 2003-2004 [5]. OCWD's Groundwater Management Plan was most recently updated in March 2004 [6].

Irvine Subbasin

Within the Basin, degraded groundwater from the Irvine Subbasin provides non-potable water for agricultural and landscape use. The groundwater in this Subbasin is high in total dissolved solids, color and nitrates. This Subbasin has a perennial groundwater yield estimated at 13,000 AF. The Irvine Company ("TIC"), the major landowner in IRWD, has historically pumped agricultural water from the Irvine Subbasin. (As in the rest of the Basin of which this Subbasin is a part, the groundwater rights have not been adjudicated, and OCWD provides governance and management under the Act.) By agreement between TIC and IRWD, the TIC production capability, wells and other facilities and associated rights have been transferred IRWD. A portion of the existing Subbasin produces water which is of potable quality. IRWD is currently

constructing facilities to treat some of the water produced for potable use, by means of the Irvine Desalter Project.

Los Alisos Water District (LAWD) Wells
IRWD also currently operates six wells within the unadjudicated Lake Forest area, however, this area does not overlie the Basin and therefore currently has much less groundwater production capability. The majority of these wells produce poor quality supply which supplements the tertiary reclamation plant production in order to meet peak seasonal demand. IRWD is presently evaluating the future use of these wells.

Allowable Groundwater Pumping. OCWD manages the amount of production in the basin through financial incentives. The framework for the financial incentives is based on establishing the Basin Production Percentage (BPP). The BPP is the ratio of groundwater production to total water demands expressed as a percentage. Pumping below the BPP is charged a fee on a per acre-foot basis, the Replenishment Assessment (RA). Groundwater production above the BPP is charged the RA and the 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. Section 31.5 of the Act empowers OCWD Board to annually establish the BPP. It has been OCWD's goal to maintain and/or raise the BPP as high as possible to allow pumpers as much groundwater as possible [6]. The BPP remained at 75% from 1993 to July 2003 when it was reduced to 66%, and for the current fiscal year, OCWD adopted a BPP of 64%. This is anticipated by IRWD to be a temporary measure employed by OCWD to encourage lower pumping levels as OCWD implements other measures to reduce the current accumulated overdraft in the Basin. This reduction is not expected to affect any of IRWD's currently available groundwater supplies listed herein, which are subject to a contractually-set equivalent basin production percentage or are exempt from the basin production percentage.

Producers may install and operate production facilities under the Act; OCWD approval is not required. 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 system through a 54-inch pipeline in Dyer Road. The DRWF was developed starting in 1984 as a result of an agreement among IRWD, OCWD and the City of Santa Ana. The DRWF consists of 16 wells with 80.0 cfs pumping capacity, pumping from the non-colored 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, an "equivalent" BPP has been established for the DRWF, currently 28,000 AFY of non-colored water and 8,000 AFY of colored water, provided any amount of the latter 8,000 AFY not produced results in a matching reduction of the

28,000 AFY BPP. Although typically, IRWD production from the DRWF does not materially exceed the equivalent BPP, the equivalent BPP is not an extraction limitation; it results in imposition of monetary assessments on the excess production.

As stated, no pumping restrictions exist in the Basin, however, OCWD manages the production through financial disincentives for production above the BPP. Table 5 provides IRWD's allowable production under the OCWD Act and IRWD's agreements.

Table 5
Allowable Groundwater Pumping - AFY

Basin Name	Allowable Pumping – AFY
Lower Santa Ana River Basin	28,000 AFY through DRWF agreement
Lower Santa Ana River Basin	7,200 AFY through 3rd Amendment to DRWF agreement
Lower Santa Ana River Basin	Currently approximately 6,000 AFY
Lower Santa Ana River Basin (Irvine Subbasin)	11,592 AFY (both potable and non-potable)

Basin overdraft
The Department of Water Resources has not identified the Basin as overdrafted in its most current bulletin that characterizes the condition of the Basin, Bulletin 118 (2004). OCWD's Act defines annual basin overdraft to be the quantity by which production exceeds the natural replenishment of groundwater supplies during a water year. The efforts being under taken by OCWD to eliminate long-term overdraft in the Basin are described in the OCWD MPR, including in particular, Chapter 4, 5, 6, 14 and 15 of the MPR and also in the OCWD Groundwater Management Plan [6].

The accumulated overdraft is defined by the Act to be the quantity of water needed in the groundwater basin forebay to prevent landward movement of seawater into the fresh groundwater body. However, seawater intrusion control facilities have been constructed and others are under construction or planned by OCWD since the Act was written, and have been effective in preventing landward movement of seawater into the fresh groundwater body. These facilities allow greater utilization of the Basin's storage capacity. Based on these opportunities, a "target" dewatered storage of 200,000 AF has been implemented for the past several years as the appropriate accumulated overdraft level of the Basin [5].

G. Groundwater Pumped Past Five Years (§ 10631(b)(3))

Table 6 shows amounts of groundwater pumped by source over the past five years.

Table 6 *Amount of Groundwater Pumped (AFY)*					
Location	2000	2001	2002	2003	2004
Orange County Groundwater Basin	20,580	20,377	25,855	24,040	30,265
Irvine Subbasin (IRWD)	2,890	1,687	2,533	2,132	1,938
Irvine Subbasin (TIC)	4,862	3,967	5,075	4,234	3,079
Lake Forest wells	346	543	744	598	357
% of Total Water Supply	34%	32%	39%	37%	41%

H. Groundwater Projected to be Pumped (§ 10631(b)(4))

IRWD is constructing the Irvine Desalter Project treatment plants in the Irvine Subbasin which is projected to produce both potable and non-potable water supplies starting in 2007. IRWD is also pursuing the installation of additional production facilities in the west Irvine portion of the Basin. This supply is considered to be under development, however, one well has been drilled, a site for an additional well and treatment facility has been acquired by IRWD, and IRWD is in negotiation for the purchase of a third well site. The production facilities can be constructed and operated under the OCWD Act, no statutory or contractual approval is required to do so.

IRWD, as well as other producers, are discussing principles related to the annexation of remaining land within each agency's respective service areas into OCWD. Of the 84,610 acres in the IRWD service area, approximately 33,400 acres are presently within OCWD. IRWD and OCWD are negotiating terms and conditions for annexation of additional area within IRWD into OCWD. This includes approximately 14,400 acres of land with the Natural Community Conservation Plan Reserve that is not subject to development. Annexation of areas within IRWD, but outside the OCWD watershed boundary, is not contemplated. Table 7a shows the amount of groundwater projected to be pumped without annexation of additional IRWD service area into the OCWD and Table 7b presents the amounts of groundwater projected to be pumped with annexation. These amounts assume pumping within BPP and no BEA assessments.

Table 7a

Amount of Groundwater Projected to be Pumped (AFY) without annexation

Location	2010	2015	2020	2025	2030
Orange County Groundwater Basin	43,294	45,372	47,612	49,765	50,059
Irvine Subbasin (Irvine Desalter)	11,592	11,592	11,592	11,592	11,592
% of Total Water Supply	47%	46%	45%	45%	45%

Table 7b

Amount of Groundwater Projected to be Pumped (AFY) with annexation

Location	2010	2015	2020	2025	2030
Orange County Groundwater Basin	63,580	67,529	70,783	73,436	74,170
Irvine Subbasin (Irvine Desalter)	11,592	11,592	11,592	11,592	11,592
% of Total Water Supply	64%	64%	63%	63%	63%

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:
> (1) An average water year.
> (2) A single dry water year.
> (3) Multiple dry water years.
>
> For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures.

I. Reliability of Supply (§ 10631(c))

IRWD has taken an integrated approach to developing a diversity of supply sources to achieve a reliable and economical water supply system operation. Development of groundwater, both untreated and treated; and expanded recycled water, is projected to reduce the reliance on imported water supply. Imported water supplies remain a source to provide supplemental supply, as well as provide redundancy in the event of shutdowns or emergency outages. [1].

IRWD's water supply management program is aimed at maximizing the efficient use of existing supplies and to assure adequate supplies will be available to meet future water demands for its entire service area. Under IRWD's supply criteria model, adequate supplies exist to meet demands. As part of its WRMP, IRWD forecasts minimum water supply availability for each of its sources of supply and projects total water supply for subsequent years [1].

Imported Water Management. The management of imported water supplies to IRWD is performed by MWD, the regional wholesale agency. The imported supply IRWD receives from MWD is contractually subject to availability. Due to reliability on imported supplies, IRWD also relies on MWD to carefully manage supplies. The MWD planning initiatives to manage supplies are addressed in MWD's 2005 Regional Urban Water Management Plan (RUWMP) [3].

MWD has undertaken a number of planning initiatives over the past ten years. To assist local water providers that are reliant in whole or in part on MWD's imported supply, MWD provides information concerning the availability of the supplies to its entire service area. MWD's RUWMP summarizes these efforts which also include the Integrated Resources Plan (IRP), the IRP Update, the Water Surplus and Drought Management Plan, Strategic Plan and Rate Restructure. Together these provide a policy framework, guidelines and resource targets for MWD to follow into the future [3].

In 1996, MWD completed its Integrated Resource Plan ("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 its 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. MWD made revisions to the IRP including any changed conditions, which serve as the foundation for planning assumptions used in the RUMWP.

Demands on MWD

Estimates of demands on MWD for the RUWMP were derived by first estimating the total retail demands for the region and then factoring in impacts of conservation. MWD uses the "MWD-Main Water Use Forecasting System" that is a combination of statistical and end-use methods that has been adapted to conditions in Southern California. MWD also uses projections of local supplies and expected local supply programs to arrive at total demands on MWD. MWD estimates demands for single dry year, multiple dry years and average years. MWD's RUWMP shows that the region can provide reliable water supplies under both the single driest year and the multiple dry year hydrologies that have existed in past dry periods throughout the period 2010 through 2030. MWD's RUWMP provides detailed justifications for the sources of supply used for the reliability analyses. MWD has also identified buffer supplies, including additional groundwater storage and transfers that could serve to supply additional water needs [3].

Groundwater Supply Management. As stated under the "Groundwater Source" section above, OCWD is required to annually investigate the condition of the Basin, assess overdraft and accumulated overdraft, and determine the amount of water necessary for replenishment. OCWD has studied the Basin replenishment needs and potential projects to address growth in demand until 2020. This is described in detail in the OCWD MPR and Groundwater Management Plan. OCWD's Groundwater Management Plan describes OCWD's general management approach to the Basin. OCWD has historically sought to increase supply rather than restrict demand. No pumping restrictions exist and producers can obtain 100 percent of their water needs from the Basin, which greatly enhances water reliability [6].

OCWD has invested over $250 million in seawater intrusion control (injection barriers), recharge facilities, laboratories, and Basin monitoring to effectively manage the Basin. Consequently, although the Basin is currently in an "overdraft" condition, it is actually managed to allow utilization of up to 500,000 acre-feet of storage capacity of the basin during dry periods, acting as an underground reservoir and buffer against drought. OCWD also operates the basin to keep the target dewatered basin storage at 200,000 acre-feet as an appropriate accumulated

overdraft. If the Basin is too full, artesian conditions can occur along the coastal area, causing rising water and water logging, an adverse condition. Since the formation of OCWD in 1933, OCWD has made substantial investments in facilities, Basin management and water rights protection, resulting in the elimination and prevention of adverse long-term "mining" overdraft conditions. OCWD's efforts include ongoing replenishment programs and planned capital improvements. It should be noted under OCWD's management of overdraft to maximize its use for annual production and recharge operations, overdraft varies over time as the Basin is managed to keep it in balance over the long term. The Basin is not operated on an annual safe-yield basis [4].

Non-Potable Water Management. Water recycling has proven to be an effective "drought-proof" reliable supply. Water recycling within IRWD consists of using treated wastewater from the MWRP and LAWRP. Recycled water produced from MWRP during the winter months, which is not immediately used for irrigation, is delivered to seasonal storage reservoirs for use during higher demand periods. IRWD is considering expansion of its MWRP 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—recycled water from the MWRP, untreated water from MWD, local runoff and some local groundwater. Non-potable water system reliability is further enhanced by seasonal storage capacity in Rattlesnake Reservoir, Sand Canyon Reservoir, San Joaquin Reservoir and Irvine Lake.

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. However, IRWD's ability to supplement Irvine Lake storage with its imported untreated water supplies offsets the uncertainty associated with the native surface water supply.

Table 8 below shows the Supply Reliability for IRWD for Normal Water Year, Single-Dry and Multiple Dry Water Years. The water supplies projected here do not represent the total supply capacity available to IRWD but rather the projected supplies to meet the projected demands. Table 9 shows the basis of the water year data which was provided by MWDOC's 2005 RUWMP. Table 10 shows the Factors Resulting in Inconsistency of Supply.

Table 8 ***Supply Reliability for IRWD***					
		Multiple Dry Water Years			
	Normal Water Year (2010)	Single Dry Year	Year 1	Year 2	Year 3
Potable Supplies					
Purchased MWD treated	25,318	25,318	25,318	25,318	25,318
Clear groundwater	28,000	28,000	28,000	28,000	28,000
Treated groundwater	22,988	22,988	22,988	22,988	22,988
Non-potable Supplies					
Recycled water	26,203	26,203	26,203	26,203	26,203
Purchased MWD untreated	6,303	9,303	9,303	9,303	9,303
Native (surface water)	4,000	1,000	1,000	1,000	1,000
Non-potable groundwater	3,898	3,898	3,898	3,898	3,898
Total	116,710	116,710	116,710	116,710	116,710
% of Normal	100%	100%	100%	100%	100%

Table 9 ***Basis of Water Year Data***			
Water Year Type			
Normal Water Year	(Average)		
Single Dry Water Year	1961		
Multiple Dry Water Years	1959	1960	1961

Table 10 ***Factors Resulting in Inconsistency of Supply***	
Source of Supply	Climatic
Non-potable Native	Native water stored in the Santiago Dam (Irvine Lake) results from local runoff from the Santiago Creek which is dependent upon annual rainfall.

As noted in Table 8, IRWD expects 100% of normal supply reliability under single-dry and multiple-dry years. Although, native local runoff from Santiago Creek is reduced during single-dry and multiple dry-years, if needed, IRWD could purchase supplemental supplies from MWD.

J. Transfer and Exchange Opportunities (§ 10631(d))

Over the past four years, IRWD has been evaluating the potential of participating in water banking to bank exportable, wet year surplus water at lower costs, which will enhance IRWD's supplemental dry year water supply reliability. Over the past 15 years, water districts in Kern County have been in the forefront of the development of groundwater banking programs.

In 2003, IRWD reviewed potential opportunities for water banking and subsequently purchased approximately 600 acres of agricultural land in Kern County for this purpose. This property is intended to be developed for water banking purposes in cooperation with local Kern County water agencies. IRWD is in the process of working with local Kern County agencies to develop the property for water banking, and a program is contemplated, however, not in place at this time. It is anticipated that such a cooperative project will increase IRWD's water supply reliability by providing redundancy to its existing water supplies.

In 2004, IRWD entered into a preliminary agreement with Semitropic Water Storage District (Semitropic) located in Kern County on a "water banking" program. This program will make it possible for IRWD to store excess water during "wet" hydrologic periods for use during "dry" periods in order provide additional reliability in water supplies. The water would be stored in an underground aquifer in Kern County.

The storage capacity contemplated under IRWD's participation in the water bank is between 50,000 AF to 75,000 AF and the recovery capabilities are intended to be between 10,000 AFY and 20,000 AFY depending on the banked supplies available. It is expected that an exchange of stored supplies for exportable State Water Project supplies would occur between State Water Project contractors MWD, on IRWD's behalf, and Kern County Water Agency, on Semitropic's behalf.

Table 11
Transfer and Exchange Opportunities

Source of Transfer Agency	Transfer or Exchange	Short term	Proposed Quantities AFY	Long term	Proposed Quantities AFY
Semitropic Water Storage District (Kern County Water Agency)	Exchange	X	17,500	X	17,500

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), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and (I) Agricultural.

K. Water Use by Customer-type – Past, Current and Future (§ 10631(e))

Past, current and projected data on water use within IRWD from 2000 to 2030 is provided in Table 12. The current information is based on monthly records of water sales throughout the service area.

Table 12
Past, Current and Future Water Uses

Year	Water Use Sectors	Single family	Multi-family	Com-mercial	Indust-rial	Instit/ Gov	Land-Scape	Agric.	Total
2000	# of accts.	42,300	26,551	3,308	885	154	4,574	73	77,845
	AFY	23,014	4,884	6,986	6,816	2,645	27,052	16,677	88,074
2005	# of accts.	47,650	30,147	3,973	1,054	223	5,306	81	88,434
	AFY	26,103	4,868	7,663	6,047	2,842	23,371	8,801	79,696
2010	# of accts.	68,409	34,947	4,631	1,141	224	5,923	38	115,313
	AFY	36,475	6,300	9,584	8,615	3,769	34,332	8,615	107,690
2015	# of accts.	74,937	44,723	5,385	1,204	254	6,308	41	132,851
	AFY	39,156	7,901	10,922	8,904	4,183	35,829	9,295	116,190
2020	# of accts.	82,896	48,076	6,017	1,347	272	6,841	31	145,479
	AFY	42,665	8,366	12,020	9,813	4,416	38,272	7,115	122,668
2025	# of accts.	86,363	52,698	6,694	1,433	329	7,102	21	154,641
	AFY	43,783	9,033	13,173	10,287	5,269	39,141	4,767	125,453
2030	# of accts.	91,053	54,966	7,011	1,504	343	7,431	18	162,326
	AFY	45,468	9,280	13,590	10,635	5,405	40,339	4,008	128,725

All connections for IRWD are metered. Each single-family dwelling unit and many townhouses and condominiums have individual meters. Apartments and some condominiums average 15 - 20 units per meter. The majority of irrigation use within IRWD is served with recycled water; and irrigation uses throughout the IRWD service area such as school sites, parks, greenbelts, medians, homeowner association common areas, and front yard common areas are classified under Landscape.

Sales to Other Agencies

IRWD and the City of Orange entered into a water service agreement for a future development area where both IRWD and the City have jurisdiction. Development planning is currently underway and projected demands for this future area are included in "Projected Future Water Use" in Table 12.

IRWD has an agreement with neighboring Santa Margarita Water District (SMWD) to deliver excess recycled water. Annually, IRWD wholesales approximately 1,500 AF of surplus recycled water to SMWD on an as needed basis to help meet its growing recycled water demand. IRWD also wholesales recycled water to the Orange County Water District (OCWD) Green Acres Project (GAP). During the months from October through March, IRWD delivers approximately 2,500 AF of surplus recycled water to GAP. Table 13 shows IRWD's projected wholesale water sales for past, current and projected years.

Table 13

Sales to Other Agencies (AFY)

Water Distributed	2000	2005	2010	2015	2020	2025	2030
GAP	1,782	2,651	2,500	0	0	0	0
Santa Margarita WD	1,915	443	1,500	1,500	1,500	1,500	1,500

Table 14 shows IRWD's past, current and projected unaccounted for water.

Table 14

Unaccounted for Water Loss (AFY)

Water Use	2000	2005	2010	2015	2020	2025	2030
Domestic	4,008	2,863	3,800	4,100	4,400	4,600	4,650
Recycled/Untreated	289	850	1,100	1,200	1,350	1,500	1,525
Other unbilled	96	99	120	130	145	155	160
Total	4,393	3,812	5,020	5,430	5,895	6,255	6,335

IRWD's total water use including customer demands, wholesale to other agencies and unaccounted for water use for past, current and projected years is shown in Table 15.

Table 15 ***Total Water Use (AFY)***							
Water Use	2000	2005	2010	2015	2020	2025	2030
Sum of Tables 12, 13, 14	96,164	86,602	116,710	123,119	130,063	135,208	136,560

L. Demand Management Measures (§ 10631(f)-(j))

It is stated under Water Code Section 10631 (j), "Urban water supplies that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g)."

California Urban Water Conservation Council

IRWD became a signatory to the Memorandum of Understanding Regarding Water Conservation in California (MOU) in August 1991 and therefore implements a prescribed set of urban water conservation Best Management Practices (BMPs). The urban water conservation practices are intended to reduce long-term urban demands and are in addition to programs that may be instituted during occasional water supply shortages and IRWD is very committed to water use efficiency. IRWD provides the detail of its water demand management activities either implemented or scheduled to be implemented in its 2003 and 2004 Annual Report filed with the California Urban Water Conservation Council (CUWCC). Under Appendix D is a copy of IRWD's 2003 and 2004 filed Annual Report to the CUWCC.

IRWD's Rules and Regulations

IRWD's adopted Rules and Regulations [7] state:

> "it is the desire of the District to effect conservation of water resources whenever possible, such measures being consistent with legal responsibilities to utilize the water resources of the State of California and the District.
>
> Facilities for irrigation of new or existing parks, median strips, landscaped public areas or landscaped areas, lawns or gardens surrounding single family homes, condominiums, townhouses, apartments and industrial parks shall be designed and installed in such a way as to conserve water.
>
> Recycled water is considered a water resource by the District, therefore, the same restrictions shall apply for all uses of recycled water as for potable water.

Rate and extent of application of water shall be controlled by the user so as to minimize run-off from irrigated areas.
All water closets installed after January 1, 1991, must flush with 1.6 gallons of water or less. Whenever reasonably possible, water closets in existence before the effective date must be fitted with retrofit devices, such as, but not limited to, devices set into the toilet tank, which decrease the amount of water used to flush such water closets."

IRWD Rate Structure. IRWD uses a five-tiered rate structure which rewards conservation. The tiered rate billing system, based on a water budget allocation, was established to encourage conservation and discourage substandard irrigation systems. Water allocations are based on number of residents, landscape square footage and actual daily weather and evapotranspiration (ET) data for the respective area. Allocations contain more than enough water to meet the demands of landscaping and indoor use. Inefficient use is penalized with higher rates. Since the introduction of this rate structure, water consumption has dropped significantly, while the health of the landscapes within IRWD's service area has improved.

Enforcement of 1981 and 1992 California Plumbing Code. The cities within the IRWD's service jurisdiction provide for the enforcement of the 1981 and 1992 California Plumbing Code requiring all houses built or remodeled after these years to include water conserving fixtures such as low-flush toilets with maximum capacity of 1.6 gallons per toilet per flush. As noted this is included in IRWD's Rules and Regulations [7].

Landscaping Ordinance. The City of Irvine adopted an ordinance in October 1990, which provides policies, standards, and guidelines for efficient landscaping. This ordinance applies to new landscaping within commercial, industrial, and multi-family complexes. IRWD provides selected plan checking for new landscape sites at the City's request and provides assistance to all landscape users to encourage the efficient use of landscape irrigation. The Lake Forest City Council and the Orange County Board of Supervisors adopted the Comprehensive Zoning Codes guiding the design and utilization of new landscape irrigation systems in common areas of residential communities and commercial developments within the service area. On June 5, 1990 the Orange County Board of Supervisors amended the Ordinance addressing conservation of water utilized for landscape irrigation.

Free Distribution and/or Installation of Water-Saving Devices. A large number of water-saving devices have been distributed and/or installed by IRWD free-of-charge. The main devices consist of low flow showerheads, faucet aerators, toilet dams, flow restrictors, and sprinkler nozzles. (The implementation of these devices is included in IRWD's annual BMP reporting to the California Urban Water Conservation Council under Appendix D.)

Lawn Watering Guide. IRWD offers a lawn-watering guide to its customers free-of-charge. The guide is designed to help customers determine the volume of water needed to adequately irrigate lawns.

Home Water Audit Program. Home water audits are available at no charge to assist IRWD customers who maintain exterior home landscaping. The audit takes about one hour to complete. A trained auditor visits the customer's home and gives instruction on how to read the water meter, evaluate the landscaping and irrigation system, check for leaks, and install low flow showerheads, faucet aerators and toilet displacement devices. (The home water audit program is documented in IRWD's annual BMP reporting to the California Urban Water Conservation Council under Appendix D.)

Public Education Program. IRWD's public education program is aimed at promoting voluntary water conservation. The program consists of making the general public understand what the situation is, what actions are proposed, what needs to be achieved, and how to implement the program. IRWD informs its customers through billing inserts, mailers, water conservation booths, newsletters, bumper stickers, community association meetings, and local public events. Literature provided informs customers of any drought conditions that may exist, conservation methods, and their impact on water reduction. This program appeals for voluntary conservation from IRWD's customers.

Regional Conservation Efforts. The MWD and the MWDOC implement a number of conservation activities in Southern California at a regional level. These conservation activities are addressed at length in MWDOC's and MWD's RUWMPs [2], [3].

Incentive Pricing. In an effort to promote water conservation, IRWD provides untreated and recycled water supplies at lower rates than potable water. The untreated water pricing does not include a service charge, only a commodity charge to recover the cost of water purchases. The recycled water pricing policy includes a monthly service charge identical to the potable system and a lower commodity rate to encourage the use of recycled water. 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. This information may be shared with customers that exceed water use allocations and IRWD staff works closely with customers on curtailing water use to stay within set allocations.

M. Evaluation of DMMs Not Implemented (§ 10631(g))

IRWD does not have any demand management measures (DMMs) that are not currently being implemented or are not scheduled for implementation. Table 16 below indicates that the cost of non-implemented and non-scheduled DMMs is not applicable. IRWD does implement several of the BMPs using an As Least As Effective As option, as described below.

Table 16 ***Unit cost of water resulting from non-implemented DMMs and planned water supply project and programs***	
Non-implemented/Not Scheduled DMM/Planned Water Supply Project	Per-AF Cost ($)
Not applicable	

As Least As Effective As DMM Implementation

BMP 1: Water Surveys for Residential Customers

IRWD implemented a water-budget based tiered rate structure in 1991 that is at least as effective as BMP 1. In 2004, IRWD's residential per account water use still remains 6.86 % below the pre- water-budget rate structure, or 19.45 gpd. The rate structure allocates each account an indoor and outdoor water budget. Customers are penalized for any usage that exceeds the allocated budget, as follows:

Tier	Percent of Allocation	Rate
Low Volume	Up to 40%	Low Volume Discount
Conservation Base	41-100%	Base
Inefficient	101-150%	2 x Base Rate
Excessive	151-200%	4 x Base Rate
Wasteful	201%+	8 x Base Rate

This approach also encourages customers with above-allocation usage to contact the District for assistance. Those customers receive targeted water surveys that include all of the elements required in BMP 1. Due to financial impact of over-use with IRWD's rate structure, IRWD's As Least As Effective As implementation does not result in deterioration of savings over time, as is the case with standard water survey savings.

BMP 5: Large Landscape Conservation Programs and Incentives

IRWD implemented a water-budget based tiered rate structure for all accounts in 1991 that penalizes customers for inefficient use. BMP 5 is designed to achieve a 15% reduction in

landscape use. IRWD's rate structure is As Least As Effective As BMP 5, and in fact has resulted in a greater level of savings as shown below. Landscape water use decreased 56% from 1991 to 2004, and 18.75% from 1997 to 2004. The CUWCC estimates landscape savings from water use surveys at only 15%. The Table below shows the acre-feet savings per acre of landscape from IRWD's tiered rate structure.

Acre Ft/Acre/Year Water Savings from IRWD's Tier Rate Structure													
1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
4.4	3.5	3.3	3.2	2.5	2.4	2.4	1.9	2.0	2.1	2.0	2.2	1.93	1.95

BMP 9: Conservation Programs for Commercial, Industrial and Institutional (CII) Accounts

IRWD is implementing an As Least As Effective As program for BMP 9. IRWD assigns water budget allocations to all commercial, industrial and institutional customers. Customers exceeding the water budget allocation due to inefficient water use incur penalty rates, thus providing a financial incentive for CII customers to conserve water resources. BMP 9 allows agencies to implement combined programs, and agencies are considered on track if the percent of water savings when added together equals or exceeds 2.4% from 1997 baseline year use. In 1997, IRWD's total CII use was 17,249 AF for a total of 3,077 CII accounts. In 2004, total CII use had dropped to 16,835.1 AF, but the number of CII accounts increased to 4,761. IRWD's CII water use reduction from the 1997 baseline year to 2004 is 2.3%, however the number of accounts increased by 55%. Additionally, IRWD's largest single customer is the University of California, Irvine (UCI), one of the fastest growing campuses in the UC system. Therefore, the baseline comparison data is somewhat skewed, however, on a per account basis, water use has reduced from 5.6 AF per CII account in 1997 to 3.54 AF per CII account in 2004, a per account reduction of 36%.

BMP 11: Conservation Pricing

IRWD's rate structure assigns a water budget allocation to every account: residential, landscape and CII consistent with BMP 11. Customers are penalized for exceeding any use above the allocation with rates that double each tier. This rate structure was instituted to promote the efficient use of water and provide customers with economic signals as their use increased. The rate structure has provided the foundation for IRWD's water conservation programs since the early 1990's. Revenue from higher tier water use is reinvested to promote long-term improvements in water use efficiency and support IRWD's environmental programs.

IRWD's water-budget based tiered rate structure is often cited as a model for water conservation, and the results are well-documented. Residential usage dropped by an average of 12% per meter, or a total of 1,074 AF in the first year, despite a 5% growth rate and after usage had

already dropped in response to the drought. Although the average usage has increased since the drought ended, it remains below the pre-budget structure average. Landscape usage has dropped from an average of 4.4 AF per acre per year on 3,361 acres in 1991 to 1.95 AF per acre per year on 12,000 acres in 2004 (See Table under BMP 5 above).

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision Section 10635(a). The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

N. Planned Water Supply Projects and Programs (§ 10631(h))

In general, IRWD's supplies that are planned or under development may necessitate the preparation and completion of environmental documents, regulatory approvals and/or contracts prior to full construction and implementation. As outlined in the WRMP, prudent water supply and financial planning dictates that development of supplies be phased over time consistent with the growth in demand.

Imported Water. Planned water supply projects related to IRWD's imported supply is addressed in detail in MWD's and MWDOC's 2005 RUWMPs [2, 3] and may include improvements associated with the "Central Pool Augmentation Project" including a new pipeline tunnel supply to South Orange County. MWD has done extensive planning over the past decade to develop new supplies to meet its IRP reliability goals.

Groundwater. IRWD's potential sources for increased local groundwater supplies in the future include the following:

West Irvine Wells. IRWD is pursuing the installation of production facilities in the west Irvine portion of the Basin. This supply is considered to be planned and under development, however, one well has been drilled, a site for an additional well and treatment facilities has been acquired by IRWD, and IRWD is in negotiation for the purchase of a third well site. The production facilities can be constructed and operated under the Act; no statutory or contractual approval is required to do so. (See discussion of the Act under Groundwater Section above.)

Irvine Desalter Project. The Irvine Desalter Project (IDP) is a groundwater quality restoration project that is currently being constructed to clean groundwater in the vicinity of the former Marine Corps Air Station El Toro base. Because of past chemical disposal and waste handling practices at the former base, volatile organic compounds (VOC) such as trichloroethylene have entered both the shallow and principal aquifers on and adjacent to the former base. In addition, areas just outside the plume of contamination contain elevated salts and nitrates caused by natural geology and past agricultural drainage which make the water unsuitable for drinking. The IDP proposes to pump and treat groundwater containing salts and nitrates to stop its migration from the Irvine Subbasin into the Main Orange County groundwater basin and to also prevent VOC-contaminated groundwater from spreading into the Main Orange County aquifer.

The IDP will consist of three water purification plants with separate wells and pipeline systems. One plant of the IDP will produce drinking water and the other will produce non-potable water. The drinking water purification plant will use reverse osmosis and disinfection and the non-drinking water plants will purify the VOC contamination water using air stripping and carbon absorption. By providing reliable new sources of local potable and non-potable water, the project will reduce dependency on imported water sources and enhance IRWD's reliability. The IDP will yield approximately 7,700 AFY of potable drinking water and 3,900 AFY of non-potable water which will supplement IRWD's non-potable system.

Recycled Water Supply.

Upgrades to Recycled Water System: IRWD produces tertiary-treated recycled water through the District's MWRP and LAWRP. IRWD is currently in the process of upgrading both of these treatment plants to allow for increased production to meet growing recycled water demands. The MWRP's upgrade will allow for production to increase from 15 mgd to the permitted 18 mgd. The LAWRP treatment system will be upgraded and tertiary capacity to accommodate flows up to 7.3 mgd. The project includes pumping and piping facilities to allow LAWRP recycled water to be delivered to Zone B of the IRWD system and to Zone A areas in the Lake Forest service area. These upgrades are within existing permit authorizations and CEQA compliance.

Expansion to Recycled Water Treatment Capacity: Future increases in sewage within IRWD will require an increase in wastewater treatment capacity at IRWD's MWRP or require additional discharges to the Orange County Sanitation District. IRWD is considering an increase of the current MWRP rated capacity of 18 mgd to as high as 33 mgd to produce additional recycled water. IRWD is also currently undergoing the evaluation of future expansion of the MWRP to serve IRWD's ultimate recycled water demands. IRWD plans to increase the capacity of the existing plant site to produce sufficient recycled water to meet the projected demand at full build out.

Table 17 includes the estimated normal-year supply, single dry-year supply and multiple dry-year supplies from IRWD's planned water supply projects.

Table 17
Planned Water Supply Projects (AFY)

Project Name	Start Date	Completion Date	Normal Year	Single Dry Year	Multiple Dry Years
IDP-Potable	2005	2007	7,694	7,694	7,694
IDP-Non-potable	2005	2007	3,898	3,898	3,898
West Irvine Wells	2008	2009	12,700	12,700	12,700
Recycled Water System Upgrades	2005	2007	8,500	8,500	8,500
Recycled Water Expansion	2010	2013	9,107	9,107	9,107

In addition, there may be an opportunity in the future for IRWD to receive recycled water from the El Toro Water District Wastewater Treatment Plant which could serve portions of IRWD's service area. This is a proposed joint project with IRWD, Moulten Niguel Water District and El Toro Water District that is under review.

O. Ocean Desalination (§ 10631(i))

A number of sites in Southern California are currently being considered for ocean water desalination facilities. Since IRWD could someday receive potable water produced by one or more of these facilities, staff has been tracking the development of these projects. Most recently, an ocean water desalination facility is being proposed at a site in Huntington Beach. The proposed project consists of the construction and operation of a 50 million gallon per day ocean water desalination facility within the City of Huntington Beach. Currently as proposed, IRWD would not be receiving any potential supplies from this plant to meet future water demands. MWD addresses seawater desalination on a regional basis in its 2005 RUWMP and it is included in the IRP Update target under local water production [3]. Table 18 shows opportunities for ocean desalination supplies for IRWD.

Table 18
Opportunities for ocean desalination

Source	Yield AFY	Start Date	Type of Use	Other
Ocean Water	Unknown	Unknown	Potable	Unknown

Planned projects including any groundwater desalination are included above in Table 17.

P. Current or Projected Supply Includes Wholesale Water (§ 10631(k))

In coordination with MWDOC, IRWD provided projected water demands up to the year 2030. MWDOC coordinated with MWD on the amount of water MWDOC, on behalf of its member agencies, wishes to purchase over the next 25 years. According to MWDOC, all of MWDOC's member agencies methodologies and assumptions underlying demand projections may differ, therefore MWDOC performed its own projection of retail demands for its service area using MWD's MWD-Main model which combines statistical and end-use methods that are adapted to conditions in Southern California. MWDOC found that projections were close to its member agencies' projections and selected using member agencies' projections because:

1. They yield to a higher water demand projection and, hence, is a more conservative approach;
2. Consistent with Water Code Section 10631(k) for MWDOC address the reliability of MWD's supply to meet the demand of items member agencies; and
3. To maintain "consistency" in regional planning.

In MWD's RUWMP, MWD presents its supply availability at the regional level, rather than at the member-agency level. In the MWD RUWMP, MWD is able to demonstrate that it can maintain 100% reliability in meeting direct consumptive demand under a normal hydrologic year, the single-driest hydrologic year, and a series of multiple dry years through 2030. By inference, MWDOC determined the availability of its imported supplies should equate to its projected imported demand. Thus MWDOC concludes that MWD will meet all of the imported demand for direct consumption projected by MWDOC [2]. Table 19 provides the imported demand projections IRWD provided to MWDOC during preparation of the UWMP and Table 20 provides the wholesale supplies via MWDOC planned for IRWD. MWD's 2005 RUWMP includes the detailed description identifying the existing and planned sources of water available regionally to the member agencies it serves [3]. Table 21 shows the reliability of wholesale supplies to IRWD as a percentage of normal.

Table 19

IRWD imported water demand projections provided to wholesaler (AFY)

Wholesaler	2010	2015	2020	2025	2030
MWD	37,203	34,519	38,680	29,748	41,520

Table 20
Wholesaler identified & quantified existing and planned sources for IRWD (AFY)

Wholesaler	2010	2015	2020	2025	2030
MWD	37,203	34,519	38,680	29,748	41,520

Table 21
Wholesale Supply Reliability - % of Normal (AFY)

		Single Dry	Multiple Dry Years		
Wholesaler Sources		1961	Year 1 (1959)	Year 2 (1960)	Year 3 (1961)
MWD	2010	100%	100%	100%	100%
MWD	2015	100%	100%	100%	100%
MWD	2020	100%	100%	100%	100%
MWD	2025	100%	100%	100%	100%
MWD	2030	100%	100%	100%	100%

Through the IRP process, MWD has analyzed the supply reliability using historical hydrology under normal and dry year scenarios to develop estimates of water surplus and shortage over the 30-year planning horizon. MWD has estimated its demands for single dry year, multiple dry years and average years. MWD's reliability analysis from the IRP Update, shows that MWD can maintain reliable supplies under the conditions that have existed in past dry periods, throughout the period 2010 through 2025. The RUWMP shows that level of reliability extends through 2030 [3]. Although climatic factors could affect MWD's surface supplies, MWD has identified buffer supplies, including groundwater storage and transfers that could serve to supply the additional water needed. Table 22 shows factors that may result in inconsistency of MWD's supply.

Table 22
Factors Resulting in Inconsistency of Wholesaler's Supply

Source	Legal	Environmental	Water Quality	Climatic
MWD				x

Law

> 10631.5 The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

III. Demand Management Measures Implementation (§ 10631.5)

IRWD is a signatory to the Memorandum of Understanding Regarding Water Conservation in California (MOU) and therefore implements a prescribed set of urban water conservation Best Management Practices (BMPs). IRWD provides the details of the water demand management activities either implemented or scheduled to be implemented in its 2003-2004 Annual Report filed with the CUWCC in January 2005. Under Appendix D is a copy of IRWD's 2003-2004 filed Annual Report to the California Urban Water Conservation Council (CUWCC), which provides the demand management activities implemented by IRWD.

Under Appendix E is a copy of IRWD's Coverage Report (filed with CUWCC) which shows IRWD's compliance with implementing the BMPs. IRWD is in compliance will all BMPs unless indicated that it is implementing an "at least as effective as" program implementation. See additional description of IRWD's demand management activities and implementation of its programs including "at least as effective as" program implementation under Section II subsections L and M.

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.

IV. Water Shortage Contingency Plan

A. Stages of Action (§ 10632(a))

This section presents information on how IRWD manages the water supply and system during a water shortage that could result from an emergency outage or a drought. IRWD's response to inadequate water supplies varies depending on the magnitude of the shortfall.
In the event of a water shortage situation, IRWD would rely on its Water Shortage Contingency Plan (WSCP) adopted in 1987 and recently updated in 2005 (Appendix F). The WSCP provides guidelines for specific responses to specific levels of shortage ranging from Stage 1 to Stage 4 with a series of measures that may be implemented during a water shortage or drought conditions. During varying water supply conditions, IRWD has performed analysis related to reduced supply and efforts to reduce demands accordingly, including voluntary and mandatory demand reduction measures. These stages of action have been included in IRWD's Rules and Regulations (Section 15) in relation to the WSCP, which states, "the 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 the WSCP." IRWD's Board declares the level or stage of shortage based on water supply conditions.

Table 23 below identifies water supply conditions and shortage stages for IRWD.

Table 23
Water Supply Shortage Stages and Conditions

Stage	Water Supply Conditions	% Shortage
Stage 1	drought warning and low level shortage condition	10%
Stage 2	Significant drought condition	10% to 25%
Stage 3	Emergency condition	25% to 40%
Final Stage	Crisis condition of water supply shortage	40%+

B. Estimate of Minimum Supply for Next Three Years (§ 10632(b))

The UWMP Act requires quantification of the minimum water supply available during the next three years (e.g., 2006 to 2008) based on the driest three-year historic sequence for IRWD's water supply. For IRWD's groundwater supplies, the driest three year historic sequence refers to the recorded three-year period with the lowest runoff in the Santa Ana River Watershed. For IRWD's imported supplies, the driest three year historic sequence is based on MWD's RUWMP historic sequence.

Due to the diversity of IRWD's supplies, supplies remain essentially constant between normal, single-dry and multiple dry years. This is due to the fact that groundwater and MWD imported water account for all of IRWD's potable supply, and recycled water, groundwater and some imported water comprise most of IRWD's non-potable supply. Groundwater production typically remains constant or increased in cycles of dry years, even if overdraft of the basin temporarily increases, as groundwater producers reduce their demand on imported supplies to secure reliability. As stated in MWDOC's RUWMP, MWDOC expects to meet all retail consumption during a three-year dry period of 2006-2008 based on the three driest years on record and MWD is expected to be able to supply all of MWDOC's imported water during the same period [2].

The shortages in water supplies experienced during the 1976-77 droughts had only a minor impact on IRWD customers. This was largely the result of efficient management of imported water supplies by MWD. The imported water operations modified by MWD included an increase in pumping from the Colorado River supply. At the time of the drought, IRWD did not operate groundwater wells; however, the agricultural demands in the area were met largely with the local groundwater from privately owned wells.

Table 24 below provides the three-year estimated minimum water supply during normal and multiple dry-year scenarios.

Table 24
Three-Year Estimated Minimum Water Supply (Multiple Dry Years) – AF/Year

	Normal			Multiple Dry Year		
Source	2006	2007	2008	2006	2007	2008
Local	61,472	68,552	69,863	58,472	65,552	66,863
Imported	43,239	38,446	39,508	46,239	41,446	42,508
Total	104,711	106,998	109,371	104,711	106,998	109,371

MWD's Water Shortage Contingency Analysis

MWD developed a Water Surplus and Drought Management Plan (WSDM Plan) in April 1999, which guides MWD's planning and operations during both shortage and surplus conditions to achieve MWD's IRP reliability goals. MWD has undertaken extensive analysis of system reservoirs, forecasted demands and probable hydrologic conditions. The results of the analysis demonstrated the benefit of coordinated management of regional supply and storage resources.

The WSDM Plan recognized the link between surpluses and shortages and integrates planned responses to both conditions. The WSDM Plan identifies the expected sequence of resource management actions MWD will take during surpluses and shortages to minimize the probability of severe shortages that require curtailment of demands. Through effective management of its water supply, MWD fully expects to be 100 percent reliable in meeting all non-discounted, non-interruptible demands throughout the next 25 years. [3].

During water shortages, MWDOC manages its water supply to ensure it meets the demands of its member agencies. During a severe water shortage, MWDOC would use the same principles as identified in MWD's WSDM Plan, subject to any locally developed principles or adjustments found to be relevant and adopted by MWDOC Board. The details of the regional coordination and operation of the water supply during a drought are included in both MWDOC's and MWD's RUWMPs [2, 3].

Groundwater

As previously discussed under the "Groundwater" section, groundwater production typically remains constant or increases in cycles of dry years. Even if overdraft of the basin temporarily increases, the basin serves as a buffer against water shortages as groundwater producers reduce their demand on imported supplies to secure reliability.

Non-Potable

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 non-potable supply, native water captured in Irvine Lake, is reduced in single-dry and multiple-dry years. In addition, significant quantities of "reserve" water supplies (excess of supplies over demands) will be available to serve as a buffer against inaccuracies in demand projections, future changes in land use, or alterations in supply availability. In addition, the potential exists for the treatment and conversion of some reserve non-potable supplies to potable water.

C. Catastrophic Supply Interruption Plan (§ 10632(c))

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 water sources include both imported water and groundwater, it is unlikely that both sources would be out simultaneously. IRWD maintains an emergency response plan to provide information necessary to respond to an emergency situation that results in the District's inability to provide water supply.

Interruption in Imported Supplies

Interruption in source water deliveries to IRWD could occur as a result of a planned outage or emergency source outage. IRWD relies on MWD imported water for approximately 40% of all supplies to meet demands. Any possible cutback in deliveries from MWD can be mitigated to some extent (in the short term) for IRWD by the addition of other sources of supply, such as increased groundwater pumping.

The MWD member agencies reference MWD's Administrative Code for member agency outage planning criteria. Each member agency including MWDOC should have a seven-day supply of water in case of an interruption of MWD deliveries. IRWD's potable water system is linked through four existing interconnection valves. In the past, the interconnections have been used to compensate for supply interruptions resulting from scheduled and emergency outages of regional MWD pipelines.

As noted, IRWD owns capacity in the AMP and in EOCF#2 and other transmission mains that could be used to serve demands throughout the District. The availability of these additional sources enhance the reliability of IRWD's distribution system through diversification beyond its current dependence on just the AMP. IRWD is protected from the effects of the unscheduled pipeline outages such as that which occurred on the AMP in December 1999.

A complete outage of imported water from the Diemer Filtration Plant would result in the greatest supply deficiency in the IRWD system. MWD has initiated a study to look at the major water importation facilities in Orange County and the Diemer Filtration Plant (DFP) to assess the likelihood of failures and expected recovery times. This analysis will provide the Orange County retailers like IRWD with a more definitive time frame for an outage of the imported water system[1].

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 availability of supplies of water and the opportunities to share and expand the use of recycled water. The interties provide opportunities to increase regional facility operational efficiency by opening existing "emergency" interconnections on a regular basis. This increases access to water supply and allocates reservoir storage to support all systems thereby allowing flexibility of water operations and reducing the need for redundant storage capacity.

On an intercounty basis, IRWD has emergency water interconnections with several neighboring water purveyors providing a means to exchange and transfer water between agencies. Currently, IRWD has 10 interconnections: four with City of Newport Beach; one with East Orange County Water District; one with Santa Margarita Water District; one with Trabuco Canyon Water District; one with the City of Tustin; one with Mesa Consolidated Water District; and one with the City of Orange.

In the early 1980s, Orange County's regional water agencies formed the Water Emergency Response Organization of Orange County (WEROC) of which IRWD is also a member of. WEROC coordinates emergency response on behalf of all Orange County water agencies, develops an emergency plan to respond to disasters and conducts disaster training exercises for the Orange County water community.

IRWD District 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. Table 25 below provides a summary of actions in response to possible catastrophes which are intended to minimize the impacts of supply interruption on IRWD's service area.

Table 25

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 is 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 (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.

D. Mandatory Prohibitions (§ 10632(d))

The following general prohibitions contained in IRWD's Rules and Regulations, Section 15 are in effect at all times regardless of whether a declared shortage condition is in effect [7]:

(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) **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.

In the case of a declared water shortage by the Board, responses to water shortages must be made early on to prevent severe rationing and economic impacts to customers. IRWD recognizes that it is best to caution customers 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.

During Stage or Level 1 water alert conditions are declared and voluntary conservation is strongly encouraged. The water shortage situation is explained to the public and voluntary water conservation is requested. Because a prolonged drought would be a regional water problem covered by the media, it is reasonable to assume that demands would eventually be reduced as a result of the media coverage and attention.

As noted, the IRWD Board adopted a "Prohibition of Water Wastage" as included under Section 15 of IRWD's Rules and Regulations which identifies the prohibition measures, enforcement and penalties, some of which are in effect regardless of water supply conditions. The prohibitions intend to encourage and then mandate water conservation and set policies against water waste. They range from general and voluntary measures to emergency/mandatory. IRWD further defines mandatory restrictions and prohibitions in its WSCP based on declared water shortage level outlined below in Table 26.

Table 26
Mandatory Prohibitions

	Stage When Prohibition is	Stage When Prohibition

Examples of Prohibitions	Voluntarily Requested	Becomes Mandatory
Street/sidewalk cleaning	Stage 1	Stage 4
Washing cars	Stage 1	Stage 4
Pool filling	Stage 1	Stage 4
Landscape irrigation	Stage 1	Stage 4
Non-permanent agriculture	Stage 1	Stage 4
Uncorrected plumbing leaks	Always in effect	Stage 4
Gutter flooding	Always in effect	Stage 4
Waste	Always in effect	Stage 4
Washing Hard-surfaced areas	Always in effect	Stage 4

E. Consumption Reduction Methods (§ 10632(e))

All of IRWD's customers are metered which can measure reductions in water use. Metered water consumption is reported on a monthly basis through the utility billing system. During water shortage conditions, exceptionally high usage is identified and these accounts would be investigated for potential water loss or abuse problems. Imported water connections, groundwater production, and gross consumption are recorded daily and monthly and incorporated into water supply reports. During a water shortage, supplies would be closely monitored and consumption by large users monitored on a more frequent basis. In severe stages of drought, production and consumption data would be evaluated daily.

Public Education Program. IRWD's public education program is aimed at promoting voluntary water conservation. The program consists of making the general public understand what the situation is, what actions are proposed, what needs to be achieved, and how to implement the program. IRWD informs its customers through billing inserts, mailers, water conservation booths, newsletters, bumper stickers, community association meetings, and local public events. Literature provided informs customers of the drought condition, conservation methods, and their impact on water reduction. This program appeals for voluntary conservation from IRWD's customers. During the 1976-77 and 1987-1992 droughts, IRWD's response to reduce demands included public education programs aimed at promoting water conservation, as well as the adoption of a resolution prohibiting water wastage and a conservation surcharge to the water rate.

During water shortage stages 1 and 2, IRWD takes the approach to appeal for voluntary cooperation of all customers to conserve water, to impose restrictions on low priority uses, to enforce prohibitions on nonessential uses, and to initiate a public information and education campaign to achieve the specified conservation goal. During levels 3 and 4, the conservation measures are anticipated to be mandatory, including surcharges and rationing. Rationing for

residential customers and certain irrigation accounts may begin in Stage 3. Business, industrial and other nonresidential customer categories are required to reduce consumption by a certain percentage as a group. Commercial/industrial water customers using recycled water may be exempt from rationing.

It should be noted regarding landscape irrigation, approximately 90% 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 reduction may only apply to potable water accounts. This, however, may not apply to non-potable water accounts 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 Table 27.

Table 27

Consumption Reduction Methods

Consumption Reduction Method	Stage (Level) When Method Takes Effect	Projection Reduction (%)
Inform public of water shortage through schools, community associations, homeowner associations, business groups and media. Develop the public consciousness for voluntary compliance. Highlight conservation methods and water-saving devices, emphasize changing water use habits; disseminate water conservation and drought literature	Level 1	Level 1 methods are expected to reduce demands up to 10%
Increase commodity rates or reduce allocation, reduce potable landscape irrigation by 50%; activate District Task Force to consult with high-volume users to assist in reducing demands	Level 2	Cumulative levels 1 and 2 methods are estimated to reduce demand by 10-25%
Reduce customer allocations, reduce or eliminate potable landscape irrigation; ban all nonessential use such as car washing, pool filling, hydrant flushing, street cleaning; restrict industrial use	Level 3	Cumulative levels 1, 2 and 3 methods are estimated to reduce demand by 25-40%
Reduce customer allocations further, completely eliminate potable landscape and agricultural irrigation, fine violators and/or install flow restrictors	Level 4	Cumulative levels 1, 2, 3 and 4 methods are estimated to reduce demand by 40% or more

F. Penalties for Excessive Use (§ 10632(f))

As indicated, IRWD's Rules and Regulations (Section 15) provide for enforcement and penalties that may apply to violators specifically during a water shortage. Penalties that may be applied for excessive use are identified based on the shortage stage in Table 28 below.

Table 28
Penalties and Charges

	Stage When Penalty Takes Effect
Excess use charge assessed	Stage 2
Written notice of violation	Stage 2
Fine or surcharge for excess use	Stage 3
Install flow restrictor	Stage 4
Termination of service	Stage 4

Excess use charge and surcharge. In the 1978 drought, IRWD introduced a conservation surcharge of approximately 10% of the then-current commodity rate from July 5, 1977 until March 1, 1978. In its WSCP, IRWD can implement a surcharge, excess use or penalty charge at its level three-drought condition. An excess use charge based upon the ascending block rate structure is sufficient to encourage demand reduction to required levels and would be the most equitable surcharge. 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.

At the height of the 1987-1992 droughts, MWD was forced to institute supply cutbacks of 30%. In response, IRWD declared a level two-drought condition and implemented conservation measures outlined in IRWD's WSCP. These measures resulted in water savings averaging 20-25%. In 1991 during the drought, IRWD implemented its Ascending Block Rate Structure, which further improved water conservation and encouraged sound water management by customers. The Ascending Block structure provides incentives to practice water conservation and penalizes excessive water use. The Ascending Block rate structure continues to be used by IRWD to promote conservation during normal conditions and could be tightened (allocations reduced) to further reduce water use and promote conservation as necessary.

Irrigation Restriction. In the event of a serious drought condition (Stage 3 or higher), it may be necessary for IRWD to enforce mandatory consumption reduction methods, in addition to voluntary measures. In addition to excess use penalties, all common area potable water use landscape irrigation and agricultural irrigation would be reduced drastically or eliminated

completely if necessary. Complete elimination could be accomplished by locking off irrigation meters where one meter serves irrigation only, however, significant losses of permanent plantings would result. When one meter serves both internal use and landscaping (small percentage of meters), monitoring and public support would be used to eliminate irrigation. Again as previously noted, most of IRWD irrigation accounts utilized recycled water service, which may or may not require similar consumption reduction methods since this supply is considered to be drought tolerant supply. Therefore, if no shortage of recycled water supplies exist, consumption reduction/penalties may only apply to potable water accounts. This, however, may not apply to non-potable water accounts since these may be dependent on imported non-potable supplies which would most likely be reduced in a drought.

Rationing. A crisis drought condition may require the District to ration water, especially in the event of a cutback by MWDOC through MWD. A rationing may be accomplished by a variable percentage reduction based upon prior year's usage or average year's usage. A modified billing system reflecting the revised allocation would identify violators or those who exceed the rationed amount and penalties would be charged. If violations continued, the District could threaten termination of service. All nonessential uses such as car washing, pool filling, street cleaning, hydrant flushing, washing sidewalks should be banned and industrial use should be restricted as much as possible. Recycled water users may be exempt from rationing during drought.

Flow Restrictors. Under extreme conditions, flow restrictors could be installed in individual service lines.

G. Analysis of Impacts on Revenues and Expenditures (§ 10632(g))

The California Code Section 10632(g) 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.

Pricing Policy. IRWD's pricing policy is designed to recover its operating cost, as wells as discourage wasteful uses. The pricing policy is evaluated on a yearly basis and adjusted as warranted.

The Ascending Block Rate Structure developed by IRWD is intended to function as a tool to promote water use efficiency commensurate with water supply conditions. The structure includes a tiered system for all 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 unit and incorporate winter and summer allocation periods. Landscape irrigation allocations are based on site acreage and actual weather data.

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

- Monthly service charge
- Commodity charge
- Pumping Surcharge

The monthly service charge is a fixed meter charge that varies with the size of the water meter connection. Meter charges are set to meet IRWD's fixed costs of operation (e.g. salaries, supplies, etc.). The variable ascending commodity charge is set to match the cost of producing and purchasing water and is based on the number of units of water used. As previously described, this structure establishes an increasing unit cost per 100 cubic feet of water. 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. Therefore, IRWD can recover all 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 Tables show components of revenue and expenditure impacts that have been evaluated by IRWD and found no impact on IRWD revenues and expenditures.

Actions and Conditions that Impact Revenues	
Type	Anticipated Revenue Reduction
Reduced sales	no impact
Development of reserves	no impact
Impact of supplier's higher rates (Tier 2)	no impact

Actions and Conditions that Impact Expenditures	
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

Tables 29 and 30 below show how IRWD's measures overcome any revenue or expenditure impacts from a severe water shortage.

Table 29 *Proposed Measures to Overcome Revenue Impacts*	
Names of Measures	Summary of Effects
Review of rate adjustment	IRWD can revise its rates during water shortage stages to increase commodity revenues if needed to offset MWD rates.
Reserves	IRWD maintains reserves that can stabilize water rates during times of reduced water sales
Reduce overhead or decreased capital expenditures	If needed, IRWD can reduce overhead and postpone capital expenditures

Table 30 *Proposed Measures to Overcome Expenditure Impacts*	
Names of measures	Summary of Effects
Reserves	IRWD maintains reserves that can be used to overcome expenditure impacts caused by water shortage.
Reduce overhead or decreased capital expenditures	If needed, IRWD can reduce overhead and postpone capital expenditures

H. Water Shortage Contingency Ordinance/Resolution (§ 10632(h))

The IRWD Board adopted Resolution No. 1987-52 and modified Section 15 – Prohibition of Water Wastage – providing the District with a series of options that may be utilized during periods of water shortages (Appendix F). IRWD also prepared its Water Shortage Contingency Plan (WSCP) which provides the specific water supply conditions and District measures that may be implemented during shortage or drought conditions. As indicated, IRWD's Rules and Regulations Section 15 provides IRWD's water shortage contingency ordinance (Appendix G).

All of IRWD customers are metered and water usage is monitored through the tiered rate system. Customers that exceed allocations falling within the highest tiered rates are identified and notified on a regular basis regardless of water supply conditions. If during a drought, water reduction measures are implemented, IRWD can measure reductions by comparing individual

meter usage. Exceptionally high usage during a water shortage condition will be immediately identified and investigated for potential water loss (leak) or abuse problems. The District may impose penalties as noted. During all stages of water shortages, daily production figures are reported to and monitored by the appropriate District departments. IRWD may elect to read larger metered customers on a more frequent basis. Table 31 provides examples of potential mechanisms for measuring reductions of customers' water use.

Table 31
Potential Mechanisms for Reduction Measuring

Examples of Potential Mechanisms	
Use normalized or average water use baseline to determine reductions	X
More frequent review of production	X
More frequent meter reading at larger customers' location	X
More frequent leak detection and repair	X
More frequent meter checking and repair	X
System audit	X
Automated sensors and telemetry	X
Penalties for customers	X

Law

> 10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include the following:
> (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.
> (b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.
> (c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

V. Recycled Water Plan (§ 10633)

In 1963, IRWD made the decision to provide sewage collection, treatment and production of recycled water. Since 1967, IRWD has provided wastewater collection and tertiary treatment services with a defined purpose of delivering recycled water for non-potable uses. The Michelson Water Reclamation Plant (MWRP) first began delivering recycled water to agricultural users. The District began serving recycled water to agricultural users and expanded to include landscape irrigation (parks, golf courses, school grounds and play fields, community associations, open space area, green belts), and eventually to as well as front and backyard irrigation for large estate-sized residential lots, toilet flushing for large commercial buildings, carpet dying, construction dust control and a cooling tower application. IRWD also owns and operates a tertiary treatment plant called the Los Alisos Water Reclamation Plant (LAWRP) through its merger with Los Alisos Water District. IRWD currently produces approximately 13,000 AFY of recycled water from its MWRP and 2,000 AFY from its LAWRP which meets over 20% of IRWD's total water resource demands.

IRWD's Rules and Regulations, Section 1 state, "The plans for facilities to be constructed within the District are intended to be an integrated part of the District's Water Resources Master Plan, Sewer Master Plan and Sub-Area Master Plans. As it is the mandate of the State of California to effect conservation of water resources whenever possible, these Plans are also directed toward collecting, treating and reclaiming sewage and wastewater and beneficially reusing the resulting recycled water" [7].

IRWD's recycled water plan conserves and optimizes high-quality drinking water supplies for critical public purposes by reducing the use of these supplies for non-potable uses. The program also reduces the quantity of treated wastewater discharged through ocean outfalls. IRWD's program has enhanced local water supply reliability for both IRWD and the region because it

directly offsets the need for firm treated, imported water for municipal irrigation and other non-potable uses.

The use of recycled water and expansion of the system to meet future demands has always been planned by IRWD. Early on in 1986, MWD assisted IRWD's recycled water program through its Local Projects Program (LPP) by providing financial assistance in developing facilities to expand the beneficial uses and yield for recycled water, reduce the need for additional MWD imported water, and minimize disposal of wastewater. The LPP helped to fund the recycled water expansion of the MWRP then from 5,000 AFY to 10,000 AFY. More recently in 2005, MWD and IRWD entered into a Local Resources Program (LRP) agreement for assistance on capital projects to yield and deliver an additional 8,500 AFY of recycled water through MWRP and LAWRP. MWD has played a key role in supporting the growth of IRWD's extensive recycled water program. MWDOC is also a signatory to both of these LRP and LPP agreements and IRWD coordinates with MWDOC on its recycled water plan and program. Table 32 shows agencies that have participated in IRWD's recycled water program expansion.

Table 32
Participating Agencies

MWD and MWDOC	▪ LPP funding assistance (1985) ▪ LRP funding assistance (2005) ▪ Coordinate on Recycled Water Program

IRWD collects and treats the majority of wastewater generated within its service area and also coordinates recycled water production with Orange County Sanitation District and South Orange County Wastewater Authority.

Additionally, IRWD participated in the Bureau of Reclamation's Southern California Comprehensive Water Reclamation and Reuse Study which identified short and long-term recycled water implementation plans including IRWD's plan.

A. Wastewater Quantity, Quality and Current Uses (§ 10633(a)-(c))

IRWD produces tertiary-treated recycled water through the District's MWRP and LAWRP. The treated effluent produced at both plants meets the water quality standards set forth in the California Administrative Code, Title 22, Division 4 (Title 22) for use as recycled water.
The majority of wastewater collected within IRWD is treated at the MWRP and LAWRP using advanced or tertiary treatment. MWRP uses a reclamation method that simulates the process used by nature to biodegrade wastes. The end result is high quality water that earned IRWD the first unrestricted use permit issued in the state, which allows the recycled water to be used for

virtually everything but drinking. The permitted treatment capacity of the MWRP is 18.0 mgd and average flow is approximately 14 mgd. The efficiency of MWRP recycled water production has been estimated to be approximately 86% of the wastewater inflow to the plant.

After the clarification process, most of the sludge settles to the bottom of the primary clarification tanks and is pumped through underground pipes to the Orange County Sanitation District (OCSD) where it undergoes further treatment and ultimate ocean discharge. IRWD joined the OCSD in order to secure an alternate method of sewage treatment and disposal. The remaining primary effluent flows to the next stage of treatment at MWRP.

The LAWRP recycled water system is a separate wastewater collection and treatment system from MWRP, which consists of 105 miles of pipeline and one lift station which delivers wastewater to its 7.5 mgd capacity wastewater treatment plant. Secondary effluent from the wastewater plant is pumped to either the tertiary treatment plant where it is treated for use in the Lake Forest area's non-potable blended water distribution system, or to the South Orange County Wastewater Authority (SOCWA) pumping station which directs flows to the effluent transmission mains and subsequent ocean outfall. As part of the Upgrades project that IRWD is currently undergoing, LAWRP recycled water will be delivered to Zone B of the IRWD distribution system, as well as to the Zone A areas in the Lake Forest service area.

IRWD's overall service area also includes areas not served by MWRP or LAWRP wastewater treatment. Approximately 35% of all wastewater collected within IRWD's service area does not go to MWRP or LAWRP but is currently served by OCSD, Santa Margarita Water District or El Toro Water District. There are future plans to divert some of these other area flows to IRWD's treatment facilities. The following Tables 33 and 34 summarize current and projected wastewater collected by IRWD (tributary to MWRP and LAWRP), treated to recycled water standards and disposal.

Table 33
Wastewater Collected and Treated by IRWD (mgd)

	2000	2005	2010	2015	2020	2025	2030
Wastewater Collected by IRWD	16.71	18.64	22.33	23.63	24.91	26.11	26.37
Water treated to recycled water standard by IRWD	14.81	13.97	16.75	17.73	18.68	19.58	19.78

Table 34
Disposal of Wastewater Collected and Treated by IRWD (mgd)

Method of Disposal	Treatment	2005	2010	2015	2020	2025	2030

	Level						
OCSD outfall	None	1.49	1.56	1.89	2.00	2.09	2.11
SOCWA outfall	Secondary	3.10	3.67	3.67	3.67	3.67	3.70

The following table shows the current and projected wastewater flows from those areas within IRWD service area that are currently served by other agencies. IRWD plans to divert future flows from Portola Hills area to the LAWRP which are currently sent to SMWD.

Wastewater Collected and Treated by Others (mgd)							
	2000	2005	2010	2015	2020	2025	2030
OCSD	9.5	11.3	12.8	13.6	14.5	14.8	14.9
Santa Margarita Water District or El Toro Water District	.9	1.1	.5	.5	.5	.5	.5

IRWD's existing non-potable water system is supplied by three primary sources: recycled water produced at the MWRP, non-potable groundwater, untreated water purchased from MWD, and local runoff into storage reservoirs. The non-potable water system consists of two subsystems: A recycled system that delivers recycled water, supplemental untreated water, and limited non-potable groundwater to landscape, agricultural irrigation customers, estate-sized residential landscape, larger commercial buildings (for non-potable water usage toilets) and various industrial users; and an untreated water system that delivers imported untreated water and local runoff via the Irvine Lake to agricultural customers and to supplement the recycled water system. Irvine Lake provides storage and captures local runoff for the untreated water system and Sand Canyon Reservoir, Rattlesnake Reservoir and San Joaquin Reservoir provide storage for the recycled water system.

IRWD maintains a separate non-potable distribution system in the IRWD's Lake Forest area (formerly LAWD) with a blended water supply system to meet landscape and irrigation demands. The supply is a blend of tertiary treated wastewater and non-potable well water. Three wells are used to supplement the tertiary reclamation plant production in order to meet seasonal peaks in demand. There is also some surplus recycled water produced by LAWRP which is delivered to the Santa Margarita Water District instead of treating it to ocean discharge.

IRWD's non-potable system is an aggregate system consisting of three different types of supplies and it is not possible to break out one supply by user type, therefore non-potable system demands shown in Table 35a below reflect 2005 recycled water uses supplemented by non-potable groundwater and imported supplies. The previous Tables 33 and 34 show merely wastewater flows and tertiary treated supplies as collected and produced by IRWD. Of the total 22,878 AF non-potable water used in 2005, approximately 67% (15,296 AF) was from recycled water produced by IRWD and used by customers. The difference represents supplemental

supplies from non-potable wells (2,285 AF), native supplies (4,241 AF) and supplemental imported water (1,056 AF).

Table 35a ***Recycled Water Uses – Actual (AFY)***		
Type of Use	Treatment Level	2005 AFY
Agriculture	Tertiary or better	1,288
Landscape	Tertiary or better	18,220
Construction	Tertiary or better	219
Commercial/Industrial	Tertiary or better	57
Sales to others	Tertiary or better	3,094
Total		22,878

As stated, in addition to recycled water customers, IRWD serves untreated water to certain agricultural customers that are not on the recycled water distribution system but are served untreated imported supplies and native supplies. The following table represents the billed usage for untreated demands served in 2005.

Untreated Water Uses – Actual (AFY)		
Type of Use	Treatment Level	2005 AFY
Agriculture	Untreated/Runoff	6,301
Total		6,301

Law

> 10633 (d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
> 10633 (e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.
> 10633 (f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.
> 10633 (g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems and 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.

B. Potential and Projected Use (§ 10633(d)-(e))

Master planned communities within the IRWD service area are required to plan and design for recycled water use early in the process as defined by Sub-Area Master Plans prepared for specific development areas. IRWD approves all development plans for master irrigation, which must be served with recycled water. Additionally, IRWD actively pursues potential existing opportunities for recycled water conversions wherever non-potable water can be used in-lieu of potable water. The District continues to assess all potential opportunities for cost-effective recycled water conversions. These new recycled water customers are also committed to recycled water use by contractual agreement with IRWD.

Additionally, IRWD has provided recycled water service to tracts of estate-sized single-family lots for “full yard” irrigation. Most of the lots are approximately 1/2 acre, with an average of 1/4-acre irrigable landscape. IRWD currently serves over 300 estate-sized residential customers and this will continue to grow as the service area develops.

The District began requiring recycled water for larger commercial buildings’ toilet/urinal use in 1990, when IRWD was the first water district in the nation to obtain health department permits for the use of recycled water in interior spaces such as office buildings. Presently, 15 commercial buildings, including IRWD’s Headquarters and Operations Center, use recycled water for toilet and urinal flushing, with two sites using recycled water for cooling towers. The District continues to work closely with the state and county health departments on permitting for expanded uses of recycled water.

To increase utilization of recycled water in lieu of potable, IRWD is investigating potential opportunities for industrial customer uses such as industrial process water, car washing, cooling tower makeup water, boiler feed water, production of ready-mix concrete, carpet and fabric dyeing, electronics manufacturing and use in laundry facilities. IRWD works closely with commercial customers who are considering the use of recycled water, carefully reviewing water quality concerns, safety, treatment, costs, regulatory compliance, and operations. IRWD has found that customers are very encouraged and recognize the benefits that using recycled water for non-potable applications can bring to the service area.

Tables 35b and 36 shows projections of IRWD's potential and future for recycled water demands by type of use through the year 2030. These amounts represent the projected recycled water produced by IRWD's treatment plants.

Table 35b
Recycled Water Uses – Potential AFY

Type of Use	Treatment Level	2010	2015	2020	2025	2030
Agriculture	Tertiary or better	1,800	1,180	1,100	1,000	1,000
Landscape	Tertiary or better	20,088	23,114	25,048	26,441	26,805
Construction	Tertiary or better	250	222	220	200	200
Commercial/Industrial	Tertiary or better	65	75	80	90	90
Sales to others	Tertiary or better	4,000	1,500	1,500	1,500	1,500
Total		26,203	26,091	27,948	29,231	29,595

Table 36
Projected Future Use of Recycled Water in Service Area AFY

Type of Use	2010	2015	2020	2025	2030
Agriculture	1,800	1,180	1,100	1,000	1,000
Landscape	20,088	23,114	25,048	26,441	26,805
Construction	250	222	220	200	200
Commercial/Industrial	65	75	80	90	90
Sales to other agencies	4,000	1,500	1,500	1,500	1,500
Total projected use of recycled water	26,203	26,091	27,948	29,231	29,595

Table 37 shows the comparison of the projected recycled water use in 2000 for the year 2005 and the actual 2005 recycled water use. Again, since IRWD's non-potable customers' demands are met with all non-potable supplies, these projected amounts include recycled water produced by

IRWD, which makes up the majority of non-potable use, but which is supplemented by some non-potable groundwater and imported supplies.

Table 37 ***Recycled Water Uses – 2000 Projection compared with 2005 actual AFY***		
Type of Use	2000 projection for 2005	2005 actual use
Agriculture	868	1,288
Landscape	20,025	18,220
Construction	200	219
Industrial	150	57
Sales to other agencies	2,540	3,094
Total projected use of recycled water	23,783	22,878
Recycled water produced	16,853	15,296

C. Encouraging Recycled Water Use (§ 10633(f))

As previously stated, IRWD's Rules and Regulations Section 1 cover the Districts intent for the use of recycled water and further covers the mandated use under Section 4.12. Section 1 states, "If recycled water service is determined by the District to be feasible in accordance with Section 4.12, the applicant, owner or customer will be required to utilize recycled water service [7].

It is IRWD's intent to provide customers with recycled water in lieu of potable water for approved uses such as landscape irrigation, agricultural irrigation, construction water, industrial process water, cooling tower makeup water, and water for flushing toilets and urinals in larger commercial buildings. IRWD has found there is customer interest in using recycled water for landscape and industrial purposes as a highly reliable source of supply. IRWD offers customers a discount from potable rates for using recycled water service.

Table 38 below shows Methods to Encourage Recycled Water Use for IRWD. Because IRWD already has a requirement for all new construction non-potable uses, these methods may apply to retrofitting potable connections to recycled water use. Over 80% of IRWD's landscape customer use is recycled water and so where opportunities exist to retrofit existing potable customers to recycled, IRWD makes every effort to assist customers in conversions.

Table 38
Methods to Encourage Recycled Water Use

Actions	AF of use projected to result from this action				
	2010	2015	2020	2025	2030
Rate discounts	5	5	5	5	5
Prohibit specific potable use	5	5	5	5	5
Grants/low interest loans	30	50	50	50	50
Dual plumbing standards	10	10	10	10	10
Total	50	70	70	70	70

D. Recycled Water Optimization Plan (§ 10633(g))

Since 1967, IRWD has been providing recycled water for irrigation within its service area. IRWD's reclamation program has evolved from supplying agricultural needs to meeting the majority of landscape irrigation demands within the service area via an extensive dual distribution system. In addition to agricultural crops, other areas such as government facilities, schools, homeowner associations, golf courses, parks, green belts and street medians are currently supplied with recycled water.

Recycled Water Demand

The expansion of IRWD's recycled distribution system is ongoing. In addition to new development areas over the last ten years, older areas within IRWD have been converted from domestic water to recycled water use primarily for irrigation. As stated, IRWD requires that all new office buildings within its service area be dual plumbed to use recycled water for flushing toilets and urinals. Next year, IRWD plans to convert 12 more commercial buildings to recycled water.

IRWD's recycled system demands are expected to nearly double by the 2025. This is due to expansion of the system into new areas and "infill" and retrofit demands in areas currently served. To meet increased demand, IRWD is reviewing an expansion of MWRP treatment capacity. The treatment capacity of MWRP can be expanded depending on sufficient influent wastewater flow into the plant and assurance that the expansion is economically, technologically and environmentally feasible.

IRWD expects the Lake Forest service area to have some growth within its recycled system serving additional landscape irrigation demand. It is anticipated that interconnecting the two separate existing recycled water distribution systems will enhance the reliability and availability of recycled service and potential expansion to areas that are not currently served with recycled water. IRWD is planning to initiate a study which will examine all of the retrofit opportunities to recycled water in the Lake Forest area.

Recycled Water Supply

In 2003, IRWD completed a Wastewater Treatment Master Plan which includes plans to add the Harvard Avenue Trunk Sewer (HATS) wastewater flows to MWRP which are currently going to OCSD. These flows are expected to be 7.9 mgd at build out. This diversion would require an expansion of the MWRP treatment capacity, however, this flow would greatly benefit the recycled water program to meet future demands.

Other potential recycled water supplies included recycled water produced by treatment of sewage flows originating in LAWD and El Toro Water District located adjacent to IRWD along the southeast border. As mentioned under Section II, there may also be an opportunity in the future for IRWD to receive recycled water from El Toro Wastewater Treatment Plan which could serve portions of IRWD's service area. Additionally, IRWD plans to continue to use degraded groundwater to augment supply to the non-potable water system. Although the capacities of these alternatives are not anticipated to be sufficient to offset an expansion of MWRP, their utilization may contribute to optimizing recycled water supply development for the District.

Law

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

VI. Water Quality Impacts on Reliability

Groundwater

The OCWD performs extensive groundwater quality management throughout the basin. Overall the Basin has good water quality, however, OCWD Groundwater Management Plan describes some existing water quality concerns in the Basin and the OCWD's management, monitoring and improvement projects to address these concerns. Increasing salinity is a concern for all water sources and is a function of recharge water coming into the Basin and seawater intrusion. OCWD has taken a watershed management approach to avoid the potential loss of water supplies due to increasing salinity. Several management options to reduce salts input include obtaining lower TDS source water for replenishment, constructing desalter facilities (like Irvine Desalter Project) to remediate degraded groundwater, expanding barrier injection facilities to retard seawater intrusion, and maintaining an aggressive water quality monitoring program to assess Basin conditions [6].

OCWD has shown to have an extensive groundwater quality management program to protect the producers and consumers within the Basin. IRWD participates in this management program with its colored water treatment plant (DATS – Deep Aquifer Treatment System) and the Irvine Desalter Project (IDP) which is currently under construction. IRWD and OCWD are implementing the IDP which will remove total dissolved solids (TDS), nitrates and selenium from the Basin and produce quality potable water supplies. In addition, the non-potable component of the IDP will remove a plume of volatile organic compounds and high concentrations of TDS from the portions of the groundwater basin beneath the former El Toro Marine Corps Air Station.

Currently, there are no known water quality concerns affecting the availability or reliability of IRWD's groundwater supplies which cannot be mitigated for, if necessary, in the future.

Imported Water

As stated in MWD's RUWMP and IRP, MWD's planning efforts have acknowledged the importance of water quality and have set specific targets for imported water. Each of MWD's sources has specific quality issues or concerns and to date MWD has not identified any water

quality risk that cannot be mitigated. The only potential effect of water quality on the level of water supplies available could be increases in the salinity of water sources. If diminished water quality caused a need for membrane treatment, MWD could experience water losses of up to 15 percent of the water processed. However, MWD would only process a small proportion of the affected water and reduce total salinity by blending processed water with the remaining unprocessed water. Thus MWD anticipates no significant reductions in water supply availability due to water quality concerns. [3]. Table 39 show water supply changes due to water quality.

Table 39
Current & projected water supply changes due to water quality – percentage

Water source	2000	2005	2010	2015	2020	2025	2030
MWD Imported treated	0%	0%	0%	0%	0%	0%	0%
groundwater	0%	0%	0%	0%	0%	0%	0%

As indicated in Table 39, IRWD does not anticipate any percentage change to current and projected water supplies due to water quality.

Law

> 10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from the state, regional or local agency population projections within the service area of the urban water supplier.

VII. Water Service Reliability

A. Projected Normal Water Year Supply and Demand (§ 10635(a))

System supply reliability is the governing factor both during normal operations, water shortage from droughts and emergencies. IRWD's water supply reliability is enhanced through development of multiple sources of supply and adequate storage, pumping and distribution facilities. IRWD is well-positioned with regards to water supply reliability because of the availability of several independent sources of supply. As discussed, strategies to meet emergency situations, such as development of interconnection arrangements, also help to enhance system reliability.

Water Supply Comparison. Tables 40, 41 and 42 below present IRWD's supplies and demands under normal year. During normal conditions, demand does not fluctuate except for projected system growth. Water supplies projected do not represent the total supply capacity available to IRWD but rather projected supplies that would be used to meet projected demands.

Table 40
Projected Normal Water Year Supply AFY

	2010	2015	2020	2025	2030
Supply	164,121	161,421	165,014	166,434	166,434
% of Normal Year*	100%	100%	100%	100%	100%

*from Table 9. Base year for Normal water year.

Table 41
Projected Normal Water Year Demand AFY

	2010	2015	2020	2025	2030
Demand	116,710	123,119	130,063	135,208	136,560
% of year 2005	135%	142%	150%	156%	156%

Table 42 shows that in average demand years, IRWD has sufficient water to meet customer needs through 2030. This is based on a continued commitment to conservation, additional recycled water use and additional groundwater treatment.

Table 42
Projected Normal Year Supply and Demand Comparison AFY

	2010	2015	2020	2025	2030
Supply totals	164,121	161,421	165,014	166,434	166,434
Demand totals	116,710	123,119	130,063	135,208	136,560
Difference (supply - demand)	47,411	38,302	34,951	31,226	29,874
Difference as % of Supply	29%	24%	21%	19%	18%
Difference as % of Demand	41%	31%	27%	23%	22%

B. Projected Single-Dry Year Supply and Demand Comparison (§ 10635(a))

IRWD's water resource mix consists of groundwater, imported water, recycled water and some surface water. The projected supply in IRWD's WRMP assumes new potable groundwater supplies will be developed as planned to greatly reduce reliance on imported water under normal and dry year operating conditions. Imported water deliveries are expected to be reduced in the projected supply mix, only because IRWD is developing local supplies, however, IRWD owns more capacity in the imported supplies than what is projected here. It is anticipated that MWD imported water will be required for supplemental supply as well as peak and emergency conditions. As indicated in Section II, the only inconsistent source within IRWD's water supply portfolio during single dry and multiple dry years is the non-potable native runoff stored in the Irvine Lake, which relies on local runoff from Santiago Creek which is dependent upon annual rainfall. This is estimated to be a shortage of approximately 3,000 AF during single and multiple dry years.

Consistent with dry year demand assumptions from MWDOC's 2005 RUWMP, IRWD's projections reflect a seven percent increase on average in demand during periods of dry weather than during normal weather. Tables 43 through 45 shows water supplies and demands projected for IRWD under a single dry water year under five year increments. The Tables show a percentage of projected normal. As noted, the water supplies projected here do not represent the total supply capacity available to IRWD but rather the projected supplies to meet the projected demands.

Table 43 *Projected Single Dry Year Water Supply AFY*					
	2010	2015	2020	2025	2030
Supply	161,121	158,421	162,014	163,434	163,434
% of projected normal*	98%	98%	98%	98%	98%

*Projected normal from Table 40

Table 44 *Projected Single Dry Year Water Demand AFY*					
	2010	2015	2020	2025	2030
Demand	124,879	131,737	139,167	144,672	146,119
% of projected normal*	1.07%	1.07%	1.07%	1.07%	1.07%

*Projected normal from Table 41

Table 45 *Projected Single Dry Year Supply and Demand Comparison AFY*					
	2010	2015	2020	2025	2030
Supply totals	161,121	158,421	162,014	163,434	163,434
Demand totals	124,879	131,737	139,167	144,672	146,119
Difference (supply - demand)	36,242	26,684	22,847	18,762	17,315
Difference as % of Supply	22%	17%	14%	11%	11%
Difference as % of Demand	29%	20%	16%	13%	12%

In the event of a single dry year, IRWD has sufficient supply to meet demand without requiring any reduction in use. In regards to IRWD's imported supplies, as stated in its 2005 RUWMP, MWD fully expects to be 100 percent reliable throughout the next twenty years through effective management of its water supply. [3]

IRWD's effective water efficiency improvements and additional water supply will help to enhance IRWD's water supply position and ensure IRWD meets projected water demand. The District will continue to assess improving water supplies, including expanding water recycling through conversions, groundwater storage, other groundwater treatment methods or other such water supply alternatives. If necessary, for subsequent dry years, the District would enter into a Stage 1 alert (see Section IV) and emphasize voluntary reduction in water use to all customers, but may not impose any additional restrictions.

C. Projected Multiple Dry Year Supply and Demand Comparison (§ 10635(a))

Tables 46 through 48 provide projections of supply and demand under multiple dry year scenarios occurring between 2006 and 2010. Demands under multiple dry years are assumed to increase by seven percent on average over normal year demands similarly to single dry year conditions. As noted previously, the water supplies projected here do not represent the total supply capacity available to IRWD but rather the projected supplies to meet the projected demands.

Table 46
Projected Supply During Multiple Dry Year P/E 2010 AFY

	2006	2007	2008	2009	2010
Supply	135,950	143,056	143,583	153,534	161,121
% of Projected Normal	98%	98%	98%	98%	98%

Table 47
Projected Demand Multiple Dry Year P/E 2010 AFY

	2006	2007	2008	2009	2010
Demand	114,797	117,244	119,783	122,336	124,879
% of Projected Normal	107%	107%	107%	107%	107%

Table 48
Projected Supply & Demand Comparison During Multiple Dry Year P/E 2010 AFY

	2006	2007	2008	2009	2010
Supply totals	135,950	143,056	143,583	153,534	161,121
Demand totals	114,797	117,244	119,783	122,336	124,879
Difference (supply - demand)	21,153	25,812	23,800	31,198	36,242
Difference as % of Supply	16%	18%	17%	20%	22%
Difference as % of Demand	18%	22%	20%	26%	29%

Tables 49 through 51 provide projections of supply and demand under multiple dry year scenarios occurring between 2011 and 2015.

Table 49
Projected Supply During Multiple Dry Year P/E 2015 AFY

	2011	2012	2013	2014	2015
Supply	161,121	158,204	158,421	158,421	158,421
% of Projected Normal	98%	98%	98%	98%	98%

Table 50 *Projected Demand During Multiple Dry Year P/E 2015 AFY*					
	2011	2012	2013	2014	2015
Demand	126,810	125,987	127,903	129,821	131,737
% of Projected Normal	107%	107%	107%	107%	107%

Table 51 *Projected Supply & Demand Comparison During Multiple Dry Year P/E 2015 AFY*					
	2011	2012	2013	2014	2015
Supply totals	161,121	158,204	158,421	158,421	158,421
Demand totals	126,810	125,987	127,903	129,821	131,737
Difference (supply - demand)	34,311	32,217	30,518	28,600	26,684
Difference as % of Supply	21%	20%	19%	18%	17%
Difference as % of Demand	27%	26%	24%	22%	20%

Tables 52 through 54 provide projections of supply and demand under multiple dry year scenarios occurring between 2016 and 2020.

Table 52 *Projected Supply During Multiple Dry Year P/E 2020 AFY*					
	2016	2017	2018	2019	2020
Supply	159,052	159,872	160,690	161,509	162,014
% of Projected Normal	98%	98%	98%	98%	98%

Table 53 *Projected Supply During Multiple Dry Year P/E 2020 AFY*					
	2016	2017	2018	2019	2020
Demand	133,222	134,709	136,195	137,681	139,167
% of Projected Normal	107%	107%	107%	107%	107%

Table 54 *Projected Supply & Demand Comparison During Multiple Dry Year P/E 2020 AFY*					
	2016	2017	2018	2019	2020
Supply totals	159,052	159,872	160,690	161,509	162,014
Demand totals	133,222	134,709	136,195	137,681	139,167
Difference (supply - demand)	25,830	25,163	24,495	23,828	22,847
Difference as % of Supply	16%	16%	15%	15%	14%
Difference as % of Demand	19%	19%	18%	17%	16%

Tables 55 through 57 provide projections of supply and demand under multiple dry year scenarios occurring between 2021 and 2025.

Table 55 *Projected Supply During Multiple Dry Year P/E 2025 AFY*					
	2021	2022	2023	2024	2025
Supply	162,041	163,434	163,434	163,434	163,434
% of Projected Normal	98%	98%	98%	98%	98%

Table 56 *Projected Demand During Multiple Dry Year P/E 2025 AFY*					
	2021	2022	2023	2024	2025
Demand	140,268	141,369	142,470	143,572	144,672
% of Projected Normal	107%	107%	107%	107%	107%

Table 57 *Projected Supply & Demand Comparison During Multiple Dry Year P/E 2025 AFY*					
	2021	2022	2023	2024	2025
Supply totals	162,041	163,434	163,434	163,434	163,434
Demand totals	140,268	141,369	142,470	143,572	144,672
Difference (supply - demand)	21,773	22,065	20,964	19,862	18,762
Difference as % of Supply	13%	14%	13%	12%	11%
Difference as % of Demand	16%	16%	15%	14%	13%

Tables 58 through 60 provide projections of supply and demand under multiple dry year scenarios occurring between 2026 and 2030. It is anticipated that the District will be built-out by the year 2025 therefore there is no change in the supply and demand projections from 2026 to 2030.

Table 58 *Projected Supply During Multiple Dry Year P/E 2030 AFY*					
	2026	2027	2028	2029	2030
Supply	163,434	163,434	163,434	163,434	163,434
% of Projected Normal	98%	98%	98%	98%	98%

Table 59 *Projected Demand During Multiple Dry Year P/E 2030 AFY*					
	2026	2027	2028	2029	2030

Demand	144,961	145,250	145,540	145,829	146,119
% of Projected Normal	107%	107%	107%	107%	107%

Table 60
Projected Supply & Demand Comparison During Multiple Dry Year P/E 2030 AFY

	2026	2027	2028	2029	2030
Supply totals	163,434	163,434	163,434	163,434	163,434
Demand totals	144,961	145,250	145,540	145,829	146,119
Difference (supply - demand)	18,473	18,184	17,894	17,605	17,315
Difference as % of Supply	11%	11%	11%	11%	11%
Difference as % of Demand	13%	13%	12%	12%	12%

IRWD's overall supply availability contains several margins of safety or buffers:

- Significant quantities of "reserve" water supplies (excess of supplies over demands) will be available to serve as a buffer against inaccuracies in demand projects, future changes in land use, or alterations in supply availability.
- The potential exists for the treatment and conversion of some reserve non-potable supplies to potable water.
- Information provided by MWD, as the imported water supplier, concerning the adequacy of its regional supplies (from its 2005 RUWMP and IRP).
- Conservative estimates of annual potable and non-potable *imported* supplies have been made based on connected delivery capacity; additional supplies are expected to be available from these sources, based on legal entitlements, historical uses and information provided by MWD.

Law

> 10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2.
>
> 10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.
>
> 10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of this plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published… After the hearing, the plan shall be adopted as prepared or as modified after the hearing.
>
> 10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in the plan.

VIII. Adoption and Implementation of UWMP

A. Public Participation (§ 10642)

Irvine Ranch Water District (IRWD) has supported community participation in its Urban Water Management Planning efforts since development of its first plan in 1985. IRWD has held hearings inviting the public to attend prior to UWMP adoption in 1985, 1990, 1995 and 2000. IRWD notified customers in its *Pipelines* newsletters (copy following this Section VIII) to all customers information about the UWMP 2005 update and invited interested customers in reviewing the UWMP to review on line at IRWD's website at www.irwd.com or in person at IRWD's headquarters located at 15600 Sand Canyon Avenue, Irvine.

On February 17, 2005, IRWD notified all of the cities within the service area and the County of Orange of the opportunity to submit comments regarding the UWMP during the update process. IRWD received one letter from the County of Orange (See copy of letter under Appendix C) advising the District of unincorporated planning areas within IRWD's service boundary. IRWD was aware of these plans and had previously included these demands for development of these areas because IRWD coordinates closely with the land owner (The Irvine Company) on all planning areas within unincorporated areas. All of the cities within IRWD's service area and the County of Orange received a copy of the draft UWMP mailed on October 28, 2005. Letters to cities and county are included under Appendix C.

A draft of the 2005 update was also made available on the website www.irwd.com and at IRWD's offices in October 2005. Notice of the IRWD public hearing was published in the Orange County Register on October 28, 2005 and November 11, 2005, and notice was posted in

the IRWD's offices on October 28, 2005 (See notice of public hearing following Section VIII). At the public hearing, there were no comments brought forth to the IRWD Board of Directors.

The Resolution to adopt the District's 2005 update to the Urban Water Management Plan was passed by the Board on November 28, 2005. (See Resolution copy following Section VIII). This update was submitted to the California Department of Water Resources within 30 days of approval by the IRWD Board of Directors. Copies of the UWMP were sent to the cities within IRWD's service area and the County of Orange and were made available to the public within 30 days following Board approval.

DWR Review for Completeness Form Checklist

UWMP Act Code	Reference in IRWD 2005 UWMP
Water Code §10620(d) – Agency coordination	Section I-A – page 1
Water Code §10620(e) – UWMP preparation	Section I-B – page 2
Water Code §10620(f) – Water management tools	Section I-C – page 2
Water Code §10621(a) – Plan updated in years ending in five and zero	Section I-D – page 3
Water Code §10621(b) – City and county notification and participation	Section I-E – pages 3-4
Water Code §10631(a) – Population, climate, demographics, land use	Section II-A-C – pages 6-8
Water Code §10631(b) – Current and planned water supplies	Section II-E – pages 9-10
Water Code §10631(b)(1)-(4) – Groundwater sources	Section II-F-H – pages 11-14
Water Code §10631(c) – Supply reliability and vulnerability to seasonal shortage	Section II-I – pages 16-19
Water Code §10631(d) – Transfer and exchange opportunities	Section II-J – page 20
Water Code §10631(e) – Water use by customer type, past, current and future	Section II-K – pages 21-22
Water Code §10631(f)-(g) – Demand management measures	Section II-L-M – pages 23-28
Water Code §10631(h) – Planned water supply projects	Section II-N – pages 29-31
Water Code §10631(i) – Ocean desalination	Section II-O – page 31
Water Code §10631(k) – Current or projected supply includes wholesale water	Section II-P– pages 32-33
Water Code §10631.5 – Determination of demand management measures implementation	Section III – page 34
Water Code §10632(a) – Water shortage contingency stages of action	Section IV-A – page 35
Water Code §10632(b) – Estimate of minimum supply for next 3 years	Section IV-B – pages 36-37
Water Code §10632(c) – Catastrophic supply interruption plan	Section IV-C – pages 38-40
Water Code §10632(d)-(f) – Prohibitions, penalties and consumption reduction methods	Section IV-E-F – pages 41-45
Water Code §10632(g) – Analysis of revenue impacts of reduced sales during shortages	Section IV-G – pages 45-47
Water Code §10632(h)-(i) – Draft ordinance and use monitoring procedure	Section IV-H – pages 47-48
Water Code §10633 – Recycled water plan coordination	Section V – pages 49-50
Water Code §10633(a)-(c) – Wastewater quantity, quality and current uses	Section V-A – pages 50-53
Water Code §10633(d)-(g) – Potential and projected use, optimization plan with incentives	Section V-B-D – pages 54-58
Water Code §10634 – Water quality impacts on reliability	Section VI – pages 59-60
Water Code §10635 – Water service reliability normal year	Section VII-A – page 61
Water Code §10635(a)-(d) – Projected single-dry year	Section VII-B – pages 62-63
Water Code §10635(a)-(d) – Projected multiple-dry year	Section VII-C – pages 64-67
Water Code §10642, §10644(a), §10645 – Public involvement, file with DWR, plan available to public	Section VIII– pages 68-69

Irvine Ranch Water District **Pipelines**

The Newsletter of Irvine Ranch Water District / September 2005
Volume 2005 Number 9

Free Water Awareness Tours

Irvine Ranch Water District (IRWD) offers free Water Awareness Tours to all its customers.

The Fall tours will be held on Friday and Saturday, October 7 and 8.

These tours, open to those who live or work with IRWD boundaries, are an excellent opportunity to gain valuable information about the water system, wastewater treatment, and recycled water use.

The free tours start promptly at 8 a.m. and conclude at approximately 2 p.m. Lunch is provided. The tours fill very quickly and are first-come first-served based on the date we receive your reservation. You will receive a call if your selection is not available. We are unable to accommodate children under 16 years of age.

Customers may register on the IRWD Web site at www.irwd.com or call (949) 453-5500.

FREE Fall Residential Landscape Workshop

WHEN:
Friday, October 28
6:00 to 9:00 p.m.

WHERE:
IRWD Headquarters
15600 Sand Canyon Avenue
Irvine CA, 92618

Fall 2005 brings a new, fun workshop format which features both fact-filled talks and hands-on demonstrations by local irrigation, gardening and landscape specialists. Workshop topics may include:

- How to water for plant health and low water bills
- Irrigation system basics
- Landscape design basics
- How to prepare soil for greater plant success

Limited seating. Reserve your seat(s) online at http://www.irwd.com/FreePrograms/workshops.php

If you do not have internet access, please call 949-453-5327 to make your reservation.

STATE TAKES IRWD PROPERTY TAXES

As you well know, property owners in Orange County pay billions of dollars in basic property taxes each year. These tax revenues are allocated according to a complex formula among local governments and special districts such as IRWD.

While property taxes are assessed, levied, collected and distributed at the local level, in 1978 Proposition 13 made the state the final arbiter in deciding who receives basic property tax monies and how much they receive. Proposition 13 also set the maximum basic tax rate at 1% of assessed property value per year. Thus, it is commonly referred to as the "1% property tax."

How IRWD Uses 1% Property Taxes

IRWD maintains over 1,000 miles of drinking water pipelines, over 300 miles of recycled water pipelines, over 600 miles of sewer pipes, 40 reservoirs and two large wastewater treatment plants. Without these facilities, water could not be supplied or delivered and sewage could not be collected and treated.

IRWD finances facilities needed to provide water and sewer service to our growing customer base by issuing general obligation bonds, much like you finance your home with a mortgage from the bank. IRWD uses the 1% property taxes received from the state to make payments on these bonds. This makes sense - IRWD facilities are paid for by a tax on the property that directly benefits from the service we provide.

State Takes IRWD 1% Property Taxes

In early 2004 we warned you of a possible attempt by the state to change this formula that might result in the elimination or a big reduction in the portion of the 1% property taxes IRWD and many other special districts receive from the state. Unfortunately, this prediction came true. In late 2004, Governor Schwarzenegger asked local governments to help solve the state budget crisis by transferring $1.3 billion in property taxes to the state budget for the next two years. As part of this action special districts statewide lost $350 million a year in local property taxes, with cities and counties making up the difference. In Orange County alone

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STATE TAKES IRWD PROPERTY TAXES

over $59 million was lost.

Early estimates by the California Legislature indicated that an enterprise special district such as IRWD could expect to lose approximately 40% of their property taxes for two years. However during the legislative session, legislators granted special exemptions to fire districts, mosquito abatement districts and transit districts. Enterprise special districts - those that have the ability to charge their customers for service - were required to make up the property taxes lost by these special exemptions. The result was that IRWD lost much more property taxes than the original 40% estimate.

How much did IRWD lose?

IRWD currently receives approximately $13.5 million in 1% property taxes a year from the state, all of which goes to meet debt service for general obligation bonds issued to fund water and sewer infrastructure. For IRWD the state property tax shift translates into a loss of almost 70%, or approximately $10 million dollars a year for a total of over $20 million dollars over the next two years.

IRWD Gets a Double Hit

To make matters worse, IRWD was not the only local agency to lose property tax money to the state. In Orange County, the Orange County Water District manages the groundwater basin. Drinking water pumped by IRWD from local wells is assessed a replenishment fee by OCWD. These fees are incorporated into the rates paid by IRWD customers. As an enterprise special district, the Orange County Water District also lost a significant portion of their property taxes, over $7 million, to the state for the next two years. This loss in funds will be recouped by charging their customers, such as IRWD, a special assessment on the water basin replenishment fee.

Impact on IRWD Customers

The two-year $20 million shift of the District's current 1% property tax distribution will be offset by 1) raising other IRWD taxes assessed to property owners in the District by approximately $.02 per hundred dollars of assessed value (land only) and 2) raising the fees charged for new service connections by approximately 23.5% overall. For example, a median cost home in Orange County valued at $600,000 can expect an increase in taxes of approximately $66 a year.

Over the coming years IRWD customers will continue to pay the same 1% property taxes to the state plus the additional IRWD imposed taxes and fees needed to pay our infrastructure bond payments. In the end, this was roundabout way for the state to quietly raise taxes by forcing IRWD to increase fees and assessments to offset 1% property tax revenues taken by the state.

It's unclear why the true impact of the local government property tax shift was never made public during the lengthy legislative hearings in Sacramento. What is clear is that consequences of this shift are much more dramatic and far-reaching than was ever discussed during the state budget negotiations. Because of the continuing fiscal crisis in Sacramento, we do not expect this shift to end after the two year time period.

IRWD is a non-profit public agency, so we budget to break even every year. Our annual operations costs are funded through the monthly bills paid by our customers and our annual infrastructure bond payments are funded from the basic 1% property taxes we receive each year.

Urban Water Management Plan

Irvine Ranch Water District (IRWD) is currently updating the Urban Water Management Plan (UWMP) to be submitted to the Department of Water Resources (DWR) by December 31, 2005. The UWMP serves as a long-range planning document for water supply and demand and provides an overview of IRWD's water supply and usage, recycled water and conservation programs. In accordance with the California Urban Water Management Planning Act, all California agencies providing water to more than 3,000 customers or more than 3,000 acre-feet of water per year are required to update their Urban Water Management Plan (UWMP) every five years and submit them to the Department of Water Resources.

Customers interested in reviewing the 2000 plan may do so on IRWD's Web site at www.irwd.com. Copies are also available for review at IRWD's headquarters located at 15600 Sand Canyon Avenue, Irvine, 92618.

A draft of the 2005 update will be available for review on IRWD's Web site (www.irwd.com) or at IRWD's headquarters in October 2005. A 30-day public comment period will follow and a public hearing will be held in November 2005 prior to the adoption of the plan.

You may submit comments or questions to Kelly Welch at welch@irwd.com, (949) 453-5604, IRWD, 15600 Sand Canyon Avenue, Irvine, 92618.

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

October 28, 2005

NOTICE OF PUBLIC HEARING
IRVINE RANCH WATER DISTRICT
ADOPTION OF 2005 URBAN WATER MANAGEMENT PLAN

Notice is hereby given that the Board of Directors of Irvine Ranch Water District will conduct a public hearing at 6:00 p.m. on November 28, 2005, 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 2005 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