

## Inland Empire Utilities Agency

A MUNICIPAL WATER DISTRICT

6075 Kimball Ave, • Chino, CA 91708  
P.O. Box 9020 • Chino, Hills, CA 91709  
TEL (909) 993-1600 • FAX (909) 597-8875  
[www.ieua.org](http://www.ieua.org)

April 2, 2007

Mr. David Todd, Chief  
Office of Water Use Efficiency & Transfers  
Department of Water Resources  
Post Office Box 942836  
Sacramento, CA 94236-0001

**Subject:** Amended Inland Empire Utilities Agency  
2005 Urban Water Management Plan  
Adopted Resolution No. 2006-6-16  
Addition of Appendix Z – Supply and Demand Projections through 2030

Dear Mr. Todd,

Please find enclosed for your review, a copy of Inland Empire Utilities Agency's adopted Resolution No. 2006-6-16, "Amendment to IEUA's 2005 Regional Urban Water Management Plan", incorporating Appendix Z into the plan for regional supply and demand projections through 2030. An electronic copy of Appendix Z was also forwarded to you via e-mail on Wednesday, March 29, 2007.

If you should have any questions or require further information regarding this addition, please contact me directly at 909-993-1520. Thank you.

Sincerely,

Lisa Morgan-Perales  
Water Resources Analyst

Attachments

Cc: Martha Davis, Executive Manager, Policy Development  
Gary Hackney, Manager, Recycle Water

*Fifty-Five Years of Excellence in Water Resources & Quality Management*

John L. Anderson  
President

Wyatt Troxel  
Vice President

Gene Koopman  
Secretary/Treasurer

Angel Santiago  
Director

Terry Catlin  
Director

Richard W. Atwater  
Chief Executive Officer  
General Manager

RESOLUTION NO. 2006-6-16

**RESOLUTION OF THE BOARD OF DIRECTORS OF THE  
INLAND EMPIRE UTILITIES AGENCY\*, SAN  
BERNARDINO COUNTY, CALIFORNIA, ADOPTING AN  
AMENDMENT TO THE YEAR 2005 REGIONAL URBAN  
WATER MANAGEMENT PLAN**

**WHEREAS**, the California Legislature enacted Assembly Bill 797, (Water Code Section 10610 et seq., known as the Urban Water Management Planning Act) during the 1983-1984 Regular Session, and as amended subsequently, which mandates that every supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, prepare an Urban Water Management Plan; and

**WHEREAS**, the Inland Empire Utilities Agency\* is a wholesale supplier of water for a 242-square mile area in the western portion of San Bernardino County; and

**WHEREAS**, an Urban Water Management Plan shall be reviewed and updated at least once every five years and can be amended as often as deemed necessary by the agency; and

**WHEREAS**, the Inland Empire Utilities Agency\* has determined that an amendment to its approved Year 2005 Urban Water Management Plan is both prudent and necessary.

**NOW, THEREFORE**, the Board of Directors of the Inland Empire Utilities Agency\* does hereby RESOLVE, DETERMINE, AND ORDER as follows:

**Section 1.** The amendment to the Year 2005 Regional Urban Water Management Plan is hereby adopted.

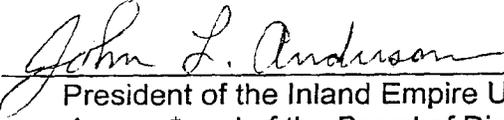
**Section 2.** The Board Secretary is hereby authorized to file three hard copies and one electronic copy of the amendment to the Year 2005 Regional Urban Water Management Plan with the State Department of Water Resources within 30 days following its adoption.

**Section 3.** The Chief Executive Officer/General Manager is hereby authorized and directed to implement the Water Programs as detailed in the amendment to the Year 2005 Regional Urban Water Management Plan, including recommendations to the Board of Directors regarding necessary procedures, rules, and regulations in an effort to carry out effective and equitable water programs.

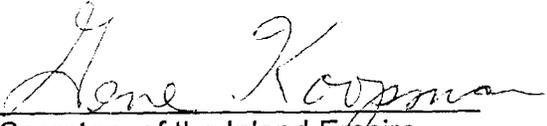
**Section 4.** The Resolution shall take effect upon adoption.

Resolution No. 2006-6-16  
Page 2

ADOPTED this 21<sup>st</sup> day of June, 2006.

  
\_\_\_\_\_  
President of the Inland Empire Utilities  
Agency\* and of the Board of Directors  
Thereof

ATTEST:

  
\_\_\_\_\_  
Secretary of the Inland Empire  
Utilities Agency\* and of the Board  
Of Directors thereof

(SEAL)

\* A Municipal Water District

STATE OF CALIFORNIA                    )  
  )SS  
COUNTY OF SAN BERNARDINO         )

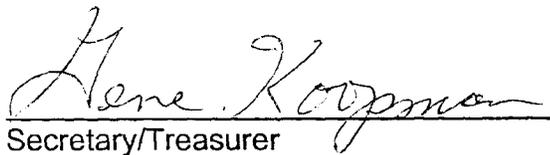
I, Gene Koopman, Secretary/Treasurer of the Inland Empire Utilities Agency\*, DO HEREBY CERTIFY that the foregoing Resolution being No. 2006-6-16, was adopted at a regular Board Meeting on June 21, 2006, of said Agency by the following vote:

AYES:     Santiago, Troxel, Catlin, Koopman, Anderson

NOES:     None

ABSTAIN:  None

ABSENT:   None

  
Secretary/Treasurer

\*A Municipal Water District

# IEUA 2005 Urban Water Management Plan

## APPENDIX Z

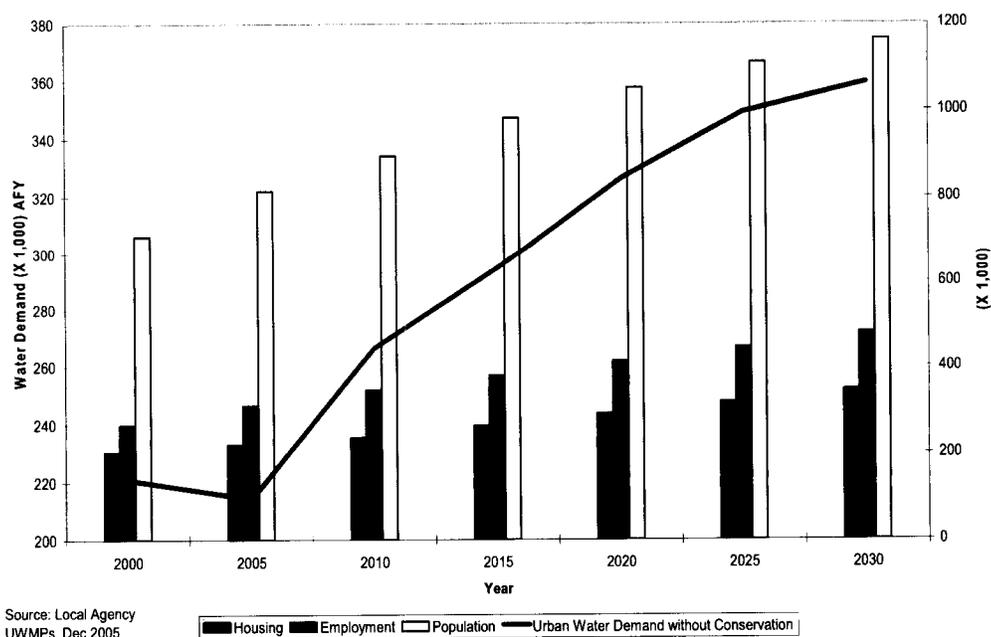
### INTRODUCTION

IEUA completed its 2005 Urban Water Management Plan (UWMP) in November 2005. All of the tables and figures in the UWMP provide data to the year 2025 as required by state law. IEUA was requested by several local agencies to provide the population and water supply and demand data through the year 2030. By providing an additional five years of data, many of the cities and local agencies would have a quality source of regional information that could be of help as they develop their local water master plans, conservation plans, water reliability assessments, etc., some of which require 25 years of projections. The data in this appendix is organized by Population Projections, Water Supply and Demand, Per Capita Water Use, and Reliability Tables, all of which take the data from IEUA's 2005 UWMP and add the 2030 data collected from the local agencies.

### POPULATION TO 2030

As shown in Chapter 2 of the UWMP, population, employment and housing is expected to grow at a rapid pace through 2025. This growth is expected to continue at a similar rate through 2030 as shown below in Figure Z-1. If the region was not engaged in efficiency programs such as conservation or water recycling, water demand (the blue

Figure Z-1  
2000-2030 Population, Housing and Employment Projections for  
IEUA's Service Area



line) between 2010 and 2030 would increase slightly faster than projected population. The specific population data is captured in Table Z-1 below. The most populated cities

**Table Z-1  
2000-2030 Projected Population by Communities  
within IEUA's Service Area<sup>1</sup>**

	2000	2005	2010	2015	2020	2025	2030
CHINO	71,668	78,715	91,090	114,978	124,476	126,646	129,319
CHINO HILLS	66,787	77,819	80,126	81,916	83,636	85,284	85,500
FONTANA	148,928	174,968	179,426	195,373	211,105	226,186	241,772*
MONTCLAIR <sup>2</sup>	46,049	54,930	59,600	66,750	71,250	76,000	81,300
ONTARIO	158,394	172,408	203,811	225,385	248,424	273,047	297,670
RANCHO CUCAMONGA <sup>3</sup>	142,743	178,855	203,870	220,180	233,400	242,700	248,000
UPLAND	70,393	73,235	73,600	73,700	73,800	73,900	74,000
SAN ANTONIO (unincorporated)	3,238	3,238	3,245	3,333	3,422	3,510	3,598*
<b>Total</b>	<b>708,200</b>	<b>814,168</b>	<b>894,768</b>	<b>981,615</b>	<b>1,049,513</b>	<b>1,107,273</b>	<b>1,161,159</b>

\*Interpolated

**MWD Estimates<sup>4</sup>**      **708,200**   **800,900**   **839,700**   **910,900**   **981,200**   **1,048,500**   **1,113,100**

<sup>1</sup>Data sources from local agencies UWMPs are variable and include Department of Finance, municipal planning dept's, and interpolation.

<sup>2</sup>Data from Monte Vista Water District 2005 UWMP. Includes Montclair, portions of Chino and unincorporated areas.

<sup>3</sup>Data from Cucamonga Valley Water District's 2005 UWMP. Include Rancho Cucamonga and portions of Upland, Ontario, and Fontana.

<sup>4</sup>SCAG data from MWD's UWMP November 2005. For comparative purposes, unincorporated population included.

through 2030 within the IEUA service area are projected to be the cities of Ontario (298,000), Rancho Cucamonga, (248,000), and Fontana (242,000). These three cities represent about 80 percent of the IEUA's service area population. However, the cities of Chino and Montclair are expected to see significant increases as development and redevelopment occur, respectively.

## **WATER SUPPLY AND DEMAND TO 2030**

The majority of the water demand within IEUA's service area has historically been for urban (residential, commercial, industrial and institutional) uses. The remaining water has been used for agricultural purposes. In 2005, about 88% of the water demand was for urban use and 12% for agriculture. As shown in Table Z-2, the agricultural water percentage is expected to drop below 2 percent of total demand by 2030.

Water supply and demand figures for 2010 through 2025 that are presented in this appendix incorporate updated supply and demand information from the City of Upland and the San Antonio Water Company. After publishing the UWMP in November 2005, several local agencies updated their water supply and demand projections for their own UWMP's. These changes are reflected in these new water supply and demand numbers and in the reliability tables. Although the numbers have changed slightly, overall, there is no significant change to the conclusions in IEUA's UWMP. That is, the

IEUA service area is reliable through 2030. The 4-5% increase in demands will be offset by a 4-5% increase in local water supply development.

**Table Z-2  
Water Demand Projection by Local Retail Agencies <sup>1</sup>**

	2000	2005	2010	2015	2020	2025	2030
City of Chino	15,764	18,400	21,900	26,200	29,900	30,100	30,300
City of Chino Hills	17,333	16,726	22,700	24,700	25,400	26,400	26,400
City of Ontario	46,420	43,000	61,300	66,600	76,600	84,300	93,400
City of Upland	23,038	22,000	23,800	25,700	27,500	29,400	29,400
Cucamonga Valley Water District	51,831	51,500	65,400	72,500	79,500	86,000	86,000
Fontana Water Company	44,317	46,600	52,000	57,000	62,700	66,000	66,000
Monte Vista Water District	11,924	12,463	13,200	14,100	14,800	15,500	16,300
San Antonio Water Company	10,257	3,500	13,264	15,025	16,786	18,547	18,547
<b>Subtotal</b>	220,884	214,189	273,564	301,825	333,186	356,247	366,347
<b>Agricultural Demand<sup>2</sup></b>	30,993	30,000	22,000	15,000	7,000	7,000	7,000
<b>Total Demand<sup>3</sup></b>	251,877	244,189	295,564	316,825	340,186	363,247	373,347

	2000	2005	2010	2015	2020	2025	2030
<b>MWD M&amp;I Demand<sup>4</sup></b>	212,000	226,600	246,700	267,200	289,900	312,800	335,000
<b>Agricultural Demand</b>	30,000	30,400	29,300	20,000	10,100	10,100	10,100
<b>Total Demand</b>	242,000	257,000	276,000	287,200	300,000	322,900	345,100

<sup>1</sup>Demand projections taken from local agency's UWMPs

<sup>2</sup>OBMP Projections – Chino Basin Watermaster assumed portion in IEUA service area

<sup>3</sup>Does not include conservation

<sup>4</sup>For comparison purposes – MWDSC UWMP, Nov 2005, Table A.1.6

As shown in Table Z-3, water demand within the residential sector (both single-family and multi-family) will dominate (about 67 percent) most of the demand in 2030.

**Table Z-3  
IEUA Urban Water Demands By Sector**

	2000	2005	2010	2015	2020	2025	2030
<b>IEUA Projected Urban Demand</b>	220,884	214,189	273,564	301,825	333,186	356,247	366,347
<b>Single-Family Demand</b>	125,904	122,088	155,931	172,040	189,916	203,060	208,817
<b>Multi-Family Demand</b>	24,297	23,561	30,092	33,200	36,650	39,187	40,298
<b>CII Demand</b>	44,177	42,838	54,712	60,365	66,637	71,249	73,269
<b>Non-Metered Water Demand</b>	26,506	25,703	32,827	36,219	39,982	42,749	43,961

Table Z-4 presents the total recycled water supply through 2030 (including groundwater, imported water, and surface runoff). Current forecasts for the use of recycled water do not utilize all of the water that is available. The additional recycled water that is available for reuse is included as part of the total local water supply.

**Table Z-4**  
**Water Supply Projection by Local Retail Agencies <sup>1</sup>**

	2000	2005	2010	2015	2020	2025	2030
City of Chino	15,764	19,000	23,900	28,800	32,500	32,500	32,500
City of Chino Hills	17,333	16,750	22,700	24,700	25,400	26,400	26,500
City of Ontario	46,420	43,000	61,300	66,600	76,700	84,400	92,500
City of Upland	23,038	23,600	26,953	28,797	30,641	32,487	32,487
Cucamonga Valley Water District	51,831	51,500	75,650	87,300	93,600	96,000	96,000
Fontana Water Company	44,317	49,400	54,800	59,800	65,500	67,200	67,200
Monte Vista Water District	11,924	12,500	27,800	27,500	31,100	30,500	30,400
San Antonio Water Company	10,257	4,135	11,260	11,260	11,967	19,032	19,032
Excess Recycled Water Supply	3,090	260	3,453	3,154	2,424	10,211	8,011
<b>Total</b>	<b>223,974</b>	<b>220,070</b>	<b>314,881</b>	<b>344,976</b>	<b>376,897</b>	<b>398,730</b>	<b>404,630</b>

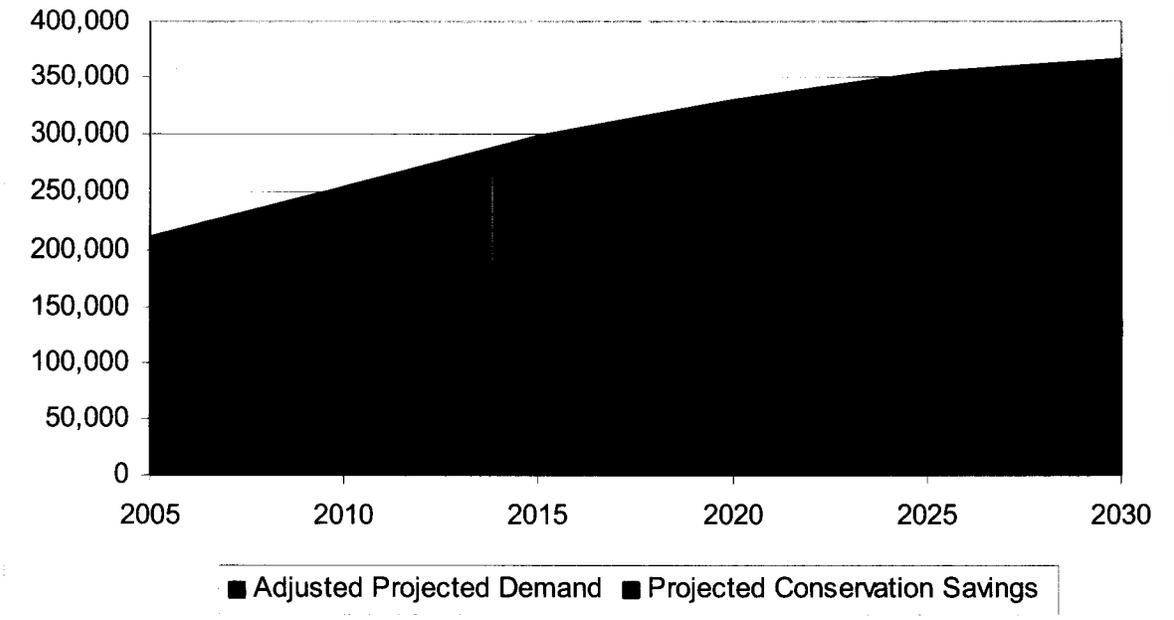
Table Z-5 provides the estimated water demand by 2030 that includes conservation as a methodology to help reduce increasing demands. IEUA estimates that the regional water conservation program will create a demand reduction of 10 percent during a normal water year.

**Table Z-5**  
**2005-2030 Projected Water Demand with Conservation**

	2000	2005	2010	2015	2020	2025	2030
City of Chino	15,764	18,400	21,900	26,200	29,900	30,100	30,300
City of Chino Hills	17,333	16,726	22,700	24,700	25,400	26,400	26,400
City of Ontario	46,420	43,000	61,300	66,600	76,600	84,300	93,400
City of Upland	23,038	22,000	23,800	25,700	27,500	29,400	29,400
Cucamonga Valley Water District	51,831	51,500	65,400	72,500	79,500	86,000	86,000
Fontana Water Company	44,317	46,600	52,000	57,000	62,700	66,000	66,000
Monte Vista Water District	11,924	12,463	13,200	14,100	14,800	15,500	16,300
San Antonio Water Company	10,257	3,500	13,264	15,025	16,786	18,547	18,547
<b>Subtotal</b>	<b>220,884</b>	<b>214,189</b>	<b>273,564</b>	<b>301,825</b>	<b>333,186</b>	<b>356,247</b>	<b>366,347</b>
Projected Conservation Savings	4,500	8,600	27,400	30,200	33,300	35,600	36,600
Adjusted Projected Demand	216,384	205,589	246,164	271,625	299,886	320,647	329,747

Figure Z-2 shows the total demand for the region with and without the development of conservation programs. This figure graphically presents the projected impact of conservation programs over the next 25 years in reducing demand within the IEUA service area.

**Figure Z-2  
Projected Water Demand w/ and w/o Conservation**



**PER CAPITA WATER USE**

One measure of water efficiency is to estimate the average gallons of water used each day by each individual (gallons per capita daily, GPCD). It is important to note that per capita water use does not really reflect the amount of water actually used by an individual because the estimate includes all categories of urban water use, encompassing residential, commercial, industrial, fire suppression, and distribution system losses. Thus, differences among communities, such as the percentage of residential and non-residential water uses, number and types of housing units, types of businesses, average number of people per household, average lots sizes, income level and climate, can all impact the average amount of water used per capita.

**Table Z-6  
2005 – 2030 IEUA Service Area Per Capita Demands<sup>1</sup>**

	2005	2010	2015	2020	2025	2030
GPDC w/o Conservation & Recycled Water	235	266	268	277	282	276
GPDC with Conservation & Recycled Water	216	200	197	200	198	196

<sup>1</sup>All values calculated as projected water demand (Table Z-2) divided by local agency project population (Table Z-1).

As shown in Table Z-6, in 2005, the per capita water use within IEUA’s service area was 235 GPCD. This level is slightly lower than the estimate of 255 provided by MWD for San Bernardino County (Table 2-5).

Since 2000, IEUA's per capita water usage has declined by about 56 GPCD. This is due the development of conservation and recycled water programs. In comparison to the GCPD without the benefits of conservation and recycled water programs, there is a marked difference in each five-year cycle. This suggests that, regardless of wet years (such as 2005), water use within the area is becoming more efficient and will continue to do so through 2030 when water use is expected to drop to 196 GPCD.

Based on studies conducted by the Pacific Policy Institute of California, the State of California expects water use to continue to become more efficient as utilities implement efficiency programs. Presently, average water use in the state is 232 GPCD. That number is expected to fall to 221 GPCD over the next 25 years representing a 4.6 percent decline.

## RELIABILITY TABLES TO 2030

The region's water supply is broken down into four categories: groundwater, recycled water, surface water, and imported water. With emphasis on local water supply development within IEUA's service area, including an increase in the availability of recycled water, it is anticipated that the region's dependability on full service imported water supplies will be reduced by 2030. Supply reliability described previously and summarized in Chapter 10 predicts that 100 percent of local and imported supplies will be available to meet the region's demands during a normal water year. The following Table Z-7 presents the projected water supply during a normal year through 2030.

**Table Z-7**  
**Projected Normal Year Water Supply<sup>(1)</sup> (AFY)**

Supply	2010	2015	2020	2025	2030
Groundwater <sup>(2)</sup>	185,306	200,671	217,251	225,031	230,766
Recycled Water	39,000	49,000	58,000	69,000	69,000
Surface Water	19,642	19,642	19,642	19,642	19,642
Imported Water	70,800	75,588	81,888	84,900	85,100
<b>% of Normal Year</b>					
Groundwater	124%	134%	145%	150%	154%
Recycled Water	3686%	4631%	5482%	6522%	6522%
Surface Water	183%	183%	183%	183%	183%
Imported Water	90%	96%	104%	108%	108%

**Notes:**

(1) Assumes zero conservation.

(2) Includes groundwater from Chino Basin (inc. CDA supply) and other basins.

Table Z-8 summarizes the region's demands during a normal year over the next twenty-five years. It is estimated that water demands will increase to approximately 366,000 AF by the year 2030. However, as additional recycled water supplies become available and local agencies connect to the recycled water system, the region's need for full service imported water supplies will stay relatively unchanged.

**Table Z-8**  
**Projected Normal Year Water Demand (AFY)**

	2010	2015	2020	2025	2030
<b>Demand</b>	273,564	301,825	333,186	356,247	366,347
<b>% of Year 2005</b>	128%	141%	156%	166%	171%

The comparison between supply and demand for a normal water year is presented in Table Z-9. In a normal year, zero water conservation has been assumed, providing a more conservative assessment of the region's supplies. The region is expected to meet 100 percent of water demands through the year 2030, with an annual surplus ranging from approximately 41,000 to 48,000 AF.

**Table Z-9**  
**Projected Normal Year Supply and Demand Comparison (AFY)**

	2010	2015	2020	2025	2030
<b>Supply Totals</b>	314,748	344,901	376,781	398,573	404,508
<b>Demand Totals</b>	273,564	301,825	333,186	356,247	366,347
<b>Difference (Supply minus Demand)</b>	41,184	43,076	43,595	42,326	48,161
<b>Difference as % of Supply</b>	13%	12%	12%	11%	9%
<b>Difference as % of Demand</b>	15%	14%	13%	12%	10%

### Single Dry Year

The water demands and supplies for IEUA's service area over the next twenty years were analyzed in the event that a single dry year occurs, similar to the drought that occurred in California in 1977<sup>1</sup>. The development of groundwater storage, recycled water systems, surface water supplies, and improvements in water quality and conservation, will greatly reduce the need for imported water supplies during dry years. The following paragraphs describe the available water supply to IEUA.

**Groundwater.** Groundwater supplies represent a significant supplemental source of water for water agencies within the IEUA service area. The majority of groundwater is produced from the Chino Basin with additional water produced from other local groundwater basins. The Chino Basin is the largest groundwater basin in the Upper Santa Ana Watershed, currently containing 5,000,000 AF of water in storage with an unused storage capacity of approximately 1,000,000 AF. Water rights within the Chino Basin have been adjudicated and the average safe-yield of the Basin is 140,000 AFY. It is anticipated that when over-pumping is required during a single dry year event, additional groundwater pumped beyond the safe yield of the Basin will be replenished during wet or normal years with imported water purchased from the Metropolitan Water

<sup>1</sup> Report on Metropolitan's Water Supplies, A Blueprint for Reliability, March 25, 2003. Page 10 of 29.

District of Southern California (MWD) and with supplemental water from recycled and/or surface supplies.

**Recycled Water.** Recycled water is becoming an increasingly important source of local water for the region. Recycled water is a critical component of the Optimum Basin Management Plan (OBMP), developed in 2000, to address water quality issues in the Chino Basin. Current use of recycled water within the region is approximately 7,000 AFY and is expected to increase to nearly 69,000 AF by 2030. During a single dry year, it has been assumed that recycled water will be 100 percent reliable.

**Surface Water.** A portion of the water supply for the IEUA service area is comprised of surface water. The principal sources of surface water include San Antonio Canyon, Cucamonga Canyon, Day Creek, Lytle Creek and several smaller surface streams. Currently, the region receives approximately 18,700 AFY of surface water, which is expected to hold constant through 2030. During a dry year, however, it is anticipated that the availability of surface supplies will decrease. For a single dry year event, surface supplies are assumed to have 31 percent reliability, which is estimated based upon historical rainfall data in the Prado region during the years 1970-2003. Water Year 2001-2002 was the driest on record with 5.08 inches of precipitation.

**Imported Water.** Southern California expects to have a reliable water supply for the foreseeable future due to the integrated resources planning effort of the Metropolitan Water District of Southern California (MWD) and its member agencies. As a water wholesaler, MWD supplies imported water to IEUA to meet the water needs of its service area at the lowest possible cost. MWD's *Report on Metropolitan's Water Supplies*, dated March 25, 2003, describes how MWD has created a diverse resource portfolio and aggressive conservation program to protect the reliability of the entire system. MWD demonstrates that sufficient supplies can be reasonably relied upon to meet projected supplemental demands. The report outlines MWD's Comprehensive Supplemental Supply Plan, which if implemented, would provide MWD with the capability to reliably meet projected supplemental water demands through 2030.<sup>2</sup>

As a result, during a single dry year event, MWD will have the resources to supply IEUA with 100 percent of their imported water demands. However, as discussed previously, with the DYY Program in effect, several of IEUA's retail agencies will reduce their imported water demand by their DYY Program shift, thus reducing demands on Metropolitan. During a dry year, imported water demands are expected to decrease to approximately 65 percent.

Tables Z-10 through Z-12 summarize the projected single dry year water supply and demand for the years 2010 through 2030.

---

<sup>2</sup> *Report on Metropolitan's Water Supplies, A Blueprint for Reliability*, March 25, 2003. Page 24 of 29.

**Table Z-10**  
**Projected Single Dry Year Water Supply (AFY)**

<b>Supply</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
Groundwater	215,569	230,925	247,497	255,268	256,415
Recycled Water	39,000	49,000	58,000	69,000	69,000
Surface Water	6,110	6,110	6,110	6,110	6,110
Imported Water	41,800	46,588	52,888	55,900	55,940
<b>% of Normal Year</b>					
Groundwater	116%	115%	114%	113%	113%
Recycled Water	100%	100%	100%	100%	100%
Surface Water	31%	31%	31%	31%	31%
Imported Water	59%	62%	65%	66%	66%

Notes:

(1) Projected normal use from Table Z-7.

**Table Z-11**  
**Projected Single Dry Year Water Demand (AFY)**

	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Demand</b>	273,564	301,825	333,186	356,247	358,267
<b>Conservation<sup>(1)</sup></b>	(27,356)	(30,183)	(33,319)	(35,625)	(35,827)
<b>Adjusted Demand</b>	246,208	271,643	299,867	320,622	322,440
<b>% of Projected Normal<sup>(2)</sup></b>	90%	90%	90%	90%	90%

Notes:

(1) Assumed 10% conservation of demand for single dry years.

(2) Projected Normal Use from Table Z-8.

**Table Z-12**  
**Projected Single Dry Year Supply and Demand Comparison (AFY)**

	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>
<b>Supply Totals</b>	302,479	332,623	364,495	386,278	387,465
<b>Demand Totals</b>	246,208	271,643	299,867	320,622	322,440
<b>Difference (Supply minus Demand)</b>	56,272	60,981	64,628	65,656	65,025
<b>Difference as % of Supply</b>	19%	18%	18%	17%	17%
<b>Difference as % of Demand</b>	23%	22%	22%	20%	20%

## **Multiple Dry Years**

The water demands and supplies for IEUA's service area over the next twenty years were analyzed in the event that a multiple dry year occurs, similar to the drought that occurred during the years 1990-1992<sup>3</sup>. The following paragraphs describe the available water supply to IEUA during a multiple dry year period.

**Groundwater.** Similar to the Single Dry Year scenario described previously in Chapter 10, implementing the DYY Program requires local retail agencies to produce additional groundwater in-lieu of accepting imported water deliveries. Each agency pumps additional groundwater in the amount of their shift obligation. Production in excess of the safe yield of the Basin is replaced with replenishment water during wet or normal years. With the DYY Program in place, groundwater has been assumed to be approximately 117 percent reliable during dry years.

**Recycled Water.** During multiple dry years, the use of recycled water for irrigation and other purposes helps reduce overall water demands. It has been assumed that during multiple dry years, the production of recycled water will gradually increase from 100 percent during the first dry year to 105 and 110 percent, respectively, during the next two subsequent dry years as more customers become connected to the recycled water system.

**Surface Water.** Though surface water provides a supplemental source of water during normal years, the volume of available surface water is expected to decrease in a multiple dry year scenario. Surface water reliability was estimated using rainfall data for the Prado region during the years 1970-2003. This decrease in available supplies can be offset by implementation of a conservation program during dry years or through pumping of additional groundwater. Surface water reliability is anticipated to be in the range of 50 to 85 percent during a multiple year drought.

### **Imported Water.**

During multiple dry years, local agencies reduce their imported water demands by increasing groundwater production in accordance with the DYY Program. The DYY Program reduces imported water demands by approximately 40 percent, thereby conserving Metropolitan's supplies during a drought.

The following Tables Z-13 through Z-27 summarize the projected multiple dry year water supply and demand for five-year periods during the years 2010 through 2030. Each five year period is contains three consecutive dry years where the DYY Program and conservation programs are implemented.

---

<sup>3</sup> Report on Metropolitan's Water Supplies, A Blueprint for Reliability, March 25, 2003. Page 10 of 29.

**Tables Z-13 through Z-15: 2006-2010**

**Table Z-13  
Projected Supply During Multiple Dry Year Period Ending in 2010 (AFY)**

	(normal)	(normal)	(dry)	(dry)	(dry)
<b>Supply<sup>(1)</sup></b>	<b>2006</b>	<b>2007</b>	<b>2008<sup>(2)</sup></b>	<b>2009<sup>(2)</sup></b>	<b>2010<sup>(2)</sup></b>
Groundwater	144,792	154,920	194,677	204,177	214,306
Recycled Water	13,616	19,962	26,308	34,287	42,900
Surface Water	18,888	19,077	9,532	16,416	15,203
Imported Water	66,120	66,040	37,960	39,880	41,800
<b>% of Projected Normal<sup>(3)</sup></b>					
Groundwater	100%	100%	118%	117%	116%
Recycled Water	100%	100%	100%	105%	110%
Surface Water	100%	100%	49%	84%	77%
Imported Water	100%	100%	57%	58%	59%

**Notes:**

(1) Supply values extrapolated from 2005 and 2010 data.

(2) DYY Program assumed to begin in year 2008 according to the Master Agreement. DYY Program in effect during multiple dry years.

(3) Projected Normal Use from Table Z-7.

**Table Z-14  
Projected Demand During Multiple Dry Year Period Ending in 2010 (AFY)**

	(normal)	(normal)	(dry)	(dry)	(dry)
	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Demand</b>	226,064	237,939	249,814	261,689	273,564
<b>Conservation<sup>(1)</sup></b>	0	0	(24,981)	(26,169)	(27,356)
<b>Adjusted Demand</b>	226,064	237,939	224,833	235,520	246,208
<b>% of Projected Normal<sup>(2)</sup></b>	100%	100%	90%	90%	90%

**Notes:**

(1) Assumed 10% conservation of demand for dry years. Refer to Chapter 4, Water Conservation Program.

(2) Projected Normal Use from Table Z-8.

**Table Z-15  
Projected Supply and Demand Comparison During Multiple  
Dry Year Period Ending in 2010 (AFY)**

	(normal)	(normal)	(dry)	(dry)	(dry)
	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
<b>Supply Totals</b>	243,416	259,999	268,477	294,760	314,209
<b>Demand Totals</b>	226,064	237,939	224,833	235,520	246,208
<b>Difference (Supply minus Demand)</b>	17,352	22,060	43,644	59,240	68,002
<b>Difference as % of Supply</b>	7%	8%	16%	20%	22%
<b>Difference as % of Demand</b>	8%	9%	19%	25%	28%

**Tables Z-16 through Z-18: 2011-2015**

**Table Z-16  
Projected Supply During Multiple Dry Year Period Ending in 2015 (AFY)**

	(normal)	(dry)	(dry)	(dry)	(normal)
<b>Supply<sup>(1)(2)</sup></b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
Groundwater	188,379	221,074	223,525	226,598	200,671
Recycled Water	41,000	43,000	47,250	51,700	49,000
Surface Water	19,642	9,719	16,575	15,203	19,642
Imported Water	71,758	43,715	44,673	45,630	75,588
<b>% of Projected Normal<sup>(3)</sup></b>					
Groundwater	100%	115%	115%	115%	100%
Recycled Water	100%	100%	105%	110%	100%
Surface Water	100%	49%	84%	77%	100%
Imported Water	100%	60%	60%	61%	100%

**Notes:**

(1) Supply values extrapolated from 2010 and 2015 data.

(2) DYY Program assumed to begin in year 2008 according to the Master Agreement. DYY Program in effect during multiple dry years.

(3) Projected Normal Use from Table Z-7.

**Table Z-17  
Projected Demand During Multiple Dry Year Period Ending in 2015 (AFY)**

	(normal)	(dry)	(dry)	(dry)	(normal)
	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Demand</b>	279,216	284,868	290,521	296,173	301,825
<b>Conservation<sup>(1)</sup></b>	0	(28,487)	(29,052)	(29,617)	0
<b>Adjusted Demand</b>	279,216	256,382	261,469	266,556	301,825
<b>% of Projected Normal<sup>(2)</sup></b>	100%	90%	90%	90%	100%

**Notes:**

(1) Assumed 10% conservation of demand for multiple dry years.

(2) Projected Normal Use from Table Z-8.

**Table Z-18  
Projected Supply and Demand Comparison During Multiple  
Dry Year Period Ending in 2015 (AFY)**

	(normal)	(dry)	(dry)	(dry)	(normal)
	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Supply Totals</b>	320,779	317,508	332,022	339,132	344,901
<b>Demand Totals</b>	279,216	256,382	261,469	266,556	301,825
<b>Difference (Supply minus Demand)</b>	41,562	61,126	70,554	72,576	43,076
<b>Difference as % of Supply</b>	13%	19%	21%	21%	12%
<b>Difference as % of Demand</b>	15%	24%	27%	27%	14%

**Tables Z-19 through Z-21: 2016-2020**

**Table Z-19  
Projected Supply During Multiple Dry Year Period Ending in 2020 (AFY)**

	(normal)	(dry)	(dry)	(dry)	(normal)
	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Supply<sup>(1)(2)</sup></b>					
Groundwater	203,987	236,916	239,619	242,935	217,251
Recycled Water	50,800	52,600	57,120	61,820	58,000
Surface Water	19,642	9,719	16,575	15,203	19,642
Imported Water	76,848	49,108	50,368	51,628	81,888
<b>% of Projected Normal<sup>(3)</sup></b>					
Groundwater	100%	114%	114%	114%	100%
Recycled Water	100%	100%	105%	110%	100%
Surface Water	100%	49%	84%	77%	100%
Imported Water	100%	63%	63%	64%	100%

**Notes:**

(1) Supply values extrapolated from 2015 and 2020 data.

(2) DYY Program assumed to begin in year 2008 according to the Master Agreement. DYY Program in effect during multiple dry years.

(3) Projected Normal Use from Table Z-7.

**Table Z-20  
Projected Demand During Multiple Dry Year Period Ending in 2020 (AFY)**

	(normal)	(dry)	(dry)	(dry)	(normal)
	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Demand</b>	308,097	314,369	320,642	326,914	333,186
<b>Conservation<sup>(1)</sup></b>	0	(31,437)	(32,064)	(32,691)	0
<b>Adjusted Demand</b>	308,097	282,932	288,577	294,222	333,186
<b>% of Projected Normal<sup>(2)</sup></b>	100%	90%	90%	90%	100%

**Notes:**

(1) Assumed 10% conservation of demand for multiple dry years.

(2) Projected Normal Use from Table Z-8.

**Table Z-21  
Projected Supply and Demand Comparison During Multiple  
Dry Year Period Ending in 2020 (AFY)**

	(normal)	(dry)	(dry)	(dry)	(normal)
	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>
<b>Supply Totals</b>	351,277	348,343	363,682	371,586	376,781
<b>Demand Totals</b>	308,097	282,932	288,577	294,222	333,186
<b>Difference (Supply minus Demand)</b>	43,180	65,410	75,104	77,364	43,595
<b>Difference as % of Supply</b>	12%	19%	21%	21%	12%
<b>Difference as % of Demand</b>	14%	23%	26%	26%	13%

**Tables Z-22 through Z-24: 2021-2025**

**Table Z-22  
Projected Supply During Multiple Dry Year Period Ending in 2025 (AFY)**

	(normal)	(dry)	(dry)	(dry)	(normal)
<b>Supply<sup>(1)(2)</sup></b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
Groundwater	218,807	249,968	250,919	252,475	225,031
Recycled Water	60,200	62,400	67,830	73,480	69,000
Surface Water	19,642	9,719	16,575	15,203	19,642
Imported Water	82,490	54,093	54,695	55,298	84,900
<b>% of Projected Normal<sup>(3)</sup></b>					
Groundwater	100%	113%	113%	113%	100%
Recycled Water	100%	100%	105%	110%	100%
Surface Water	100%	49%	84%	77%	100%
Imported Water	100%	65%	65%	66%	100%

**Notes:**

- (1) Supply values extrapolated from 2020 and 2025 data.
- (2) DYY Program assumed to begin in year 2008 according to the Master Agreement. DYY Program in effect during multiple dry years.
- (3) Projected Normal Use from Table 10-7.

**Table Z-23  
Projected Demand During Multiple Dry Year Period Ending in 2025 (AFY)**

	(normal)	(dry)	(dry)	(dry)	(normal)
	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
<b>Demand</b>	337,798	342,410	347,023	351,635	356,247
<b>Conservation<sup>(1)</sup></b>	0	(34,241)	(34,702)	(35,163)	0
<b>Adjusted Demand</b>	337,798	308,169	312,320	316,471	356,247
<b>% of Projected Normal<sup>(2)</sup></b>	100%	90%	90%	90%	100%

**Notes:**

- (1) Assumed 10% conservation of demand for multiple dry years.
- (2) Projected Normal Use from Table Z-8.

**Table Z-24  
Projected Supply and Demand Comparison During Multiple  
Dry Year Period Ending in 2025 (AFY)**

	(normal)	(dry)	(dry)	(dry)	(normal)
	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>
<b>Supply Totals</b>	381,139	376,179	390,019	396,456	398,573
<b>Demand Totals</b>	337,798	308,169	312,320	316,471	356,247
<b>Difference (Supply minus Demand)</b>	43,341	68,010	77,698	79,985	42,326
<b>Difference as % of Supply</b>	11%	18%	20%	20%	11%
<b>Difference as % of Demand</b>	13%	22%	25%	25%	12%

Tables Z-25 through Z-27: 2026-2030

**Table Z-25**  
**Projected Supply During Multiple Dry Year Period Ending in 2030**  
**(AFY)**

	(normal)	(dry)	(dry)	(dry)	(normal)
<b>Supply<sup>(1)(2)</sup></b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
Groundwater	226,178	236,597	237,744	238,891	230,766
Recycled Water	69,000	69,000	69,000	69,000	69,000
Surface Water	19,642	9,719	16,575	15,203	19,642
Imported Water	84,940	76,867	76,907	76,947	85,100
<b>% of Projected Normal<sup>(3)</sup></b>					
Groundwater	100%	107%	107%	107%	103%
Recycled Water	100%	111%	107%	103%	100%
Surface Water	100%	49%	84%	77%	100%
Imported Water	100%	93%	92%	91%	100%
<b>Notes:</b>					
(1) Supply values extrapolated from 2020 and 2025 data.					
(2) DYY Program assumed to begin in year 2008 according to the Master Agreement. DYY Program in effect during					
multiple dry years.					
(3) Projected Normal Use from Table Z-8.					

**Table Z-26**  
**Projected Demand During Multiple Dry Year Period Ending in**  
**2030 (AFY)**

	(normal)	(dry)	(dry)	(dry)	(normal)
	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
<b>Demand</b>	358,267	360,287	362,307	364,327	366,347
<b>Conservation<sup>(1)</sup></b>	0	-36,029	-36,231	-36,433	0
<b>Adjusted Demand</b>	358,267	324,258	326,076	327,894	366,347
<b>% of Projected Normal<sup>(2)</sup></b>	106%	95%	94%	93%	103%

**Notes:**

- (1) Assumed 10% conservation of demand for multiple dry years.
- (2) Projected Normal Use from Table Z-8.

**Table Z-27**  
**Projected Supply and Demand Comparison During Multiple**  
**Dry Year Period Ending in 2030 (AFY)**

	(normal)	(dry)	(dry)	(dry)	(normal)
	2026	2027	2028	2029	2030
<b>Supply Totals</b>	399,760	392,183	400,226	400,041	404,508
<b>Demand Totals</b>	358,267	324,258	326,076	327,894	366,347
<b>Difference (Supply minus Demand)</b>	41,493	67,924	74,149	72,147	38,161
<b>Difference as % of Supply</b>	10%	17%	19%	18%	9%
<b>Difference as % of Demand</b>	12%	21%	23%	22%	10%