

CHAPTER 6 RECYCLED WATER PROGRAM

6.1 OVERVIEW

IEUA began serving recycled water in 1972. Initially recycled water was delivered to a few large water users such as the Whispering Lakes Golf Course and Westwind Park in Ontario and Prado Park and Golf Course in Chino.

Beginning in the early 1990's IEUA began the construction of the first phase of the Carbon Canyon Recycled Water Project (CCRWP) which included treatment facilities and distribution pipelines to serve customers in Chino and Chino Hills. In conjunction with the construction of the first phase of the CCRWP, IEUA began planning for a regional recycled water delivery system to provide recycled water throughout its service area. This planning effort culminated with the completion of the IEUA Regional Recycled Water Program Feasibility Study in January 2002. The Feasibility Study identified facilities to deliver over 70,000 acre-feet of recycled water per year (AFY) to customers and recharge sites throughout the IEUA service area.

In 2004 IEUA developed a regional recycled water program implementation plan to prioritize the phased construction of the adopted 2002 Recycled Water Program Feasibility Study.

This major planning effort resulted in the completion of the 2005 Recycled Water Implementation Plan (RWIP). The RWIP identified projects to deliver recycled water of approximately 93,000 AFY utilizing an interconnected distribution pipeline system supplied from all four of IEUA's major recycled water plants.

In 2007, IEUA developed the Recycled Water Three Year Business Plan. The Business Plan is intended to guide the expansion of the IEUA recycled water system. The Plan focused on the most cost effective and rapid ways to increase the amount of recycled water available and used within IEUA's service area. The Plan is intended to focus on the following three years and would be revised and updated on an annual basis. Metrics and an annual usage goal were identified for each year. Table 6-1 shows the goals of the Recycled Water Three Year Business Plan.

Key Recycled Water Studies and Reports

- 1981 – Metcalf & Eddie / L.D. King
- 1991 – J.M. Montgomery
- 1995 – Camp, Dresser, and McKee
- 1996 – Black & Veatch
- 2000 – Optimum Basin Management Plan
- 2000 – OBMP Program EIR
- 2000 – Peace Agreement
- 2002 – IEUA Wastewater Facilities Master Plan
- 2002 – IEUA Recycled Water Feasibility Study
- 2005 – IEUA Recycled Water Implementation Plan
- 2007 – Recycled Water Three Year Business Plan

Table 6-1
Recycled Water Three Year Business Plan
Annual Goals for Connected Demand and Sales

Year		Connected Demand	Increase		Estimated Sales*
		AFY	AFY	%	AFY
Base Year	2006/07	13,000		---	---
1	2007/08	17,600	4,600	135%	13,500
2	2008/09	27,034	14,034	208%	16,000
3	2009/10	32,434	19,434	250%	24,500
4	2010/11	45,000	32,000	346%	35,000*
5	2011/12	50,000	37,000	385%	39,000*

*Estimated sales lag connections.

6.2 REGIONAL RECYCLED WATER PROGRAM

The 2002 Feasibility Study, 2005 Implementation Plan and the Recycled Water Three Year Business plan included a market assessment of the potential recycled water customers within the IEUA service area. Working with the cities and retail water agencies over 2,300 potential customers were identified. This information was used to plan the regional and local recycled water distribution pipelines. Pipeline locations were selected to provide recycled water to the largest customers or groups of customers. Ultimately, the distribution system will serve over 1,900 of the largest customers and an overall supply of approximately 104,000 AFY, which includes a large portion, will be for groundwater recharge in the Chino Basin.

Regional Recycled Water Facilities

In September 2000, the IEUA Board and Regional Technical and Policy Committees adopted a recycled water policy document which defined the roles and responsibilities of IEUA and the Regional Contracting Agencies for the construction and ownership of the regional and local facilities. Regional facilities are defined as facilities, pipelines, and pump stations, and reservoirs which serve recycled water to a recharge site or to more than one contracting agency. Regional facilities will be constructed and owned by IEUA. Local facilities will deliver recycled water from the regional facilities to customers within a contracting agency's service area and will be their responsibility. Local facilities will primarily be pipelines (local laterals) but may also include local pump stations and reservoirs. The Recycled Water Implementation Plan (2005) refined these policies regarding funding of local storage facilities that reduce regional storage needs, including provisions for joint regional/local facilities (local retail water agency or developer), and IEUA financing arrangements of local facilities and customer on-site retrofits to ensure the timely implementation of the recycled water program.

The Regional Recycled Water Facilities will consist of a looped pipeline system that connects all four Regional Water Recycling Plants as shown on Figure 6-1. Future satellite plants, generally identified in the Wastewater Master Plan adopted in 2002, will be evaluated in coordination with the retail water agencies and the Regional Technical Committee. The regional facilities include over fifty separate pipelines, pump station and reservoir projects. The priority of each phase was determined based on the amount of recycled water each phase could serve and the proximity of each phase to one of the regional water recycling plants or existing recycled water transmission mains.

Local Recycled Water Facilities

As described above, local recycled water facilities are those which serve the customers of only one contracting agency. Each local agency is responsible for the planning, design, construction and operation of local laterals within their service area. IEUA staff is working closely with each agency to coordinate their recycled water planning efforts. In order to assist the local agencies with the implementation of their recycled water systems, IEUA is providing technical assistance and, if requested, financing of the local agency's facilities. Funds for this financing are in IEUA's budget and Ten Year Capital Improvement Plan (TYCIP), however, the amount of funding will depend on the agencies' needs. Similar financing was used for the construction of the CCRWP in the 1990's and the Monte Vista Laterals in 2008.

6.3 WASTEWATER TREATMENT

IEUA manages the Regional Sewage Service System within its 242-square miles service area to collect, treat and dispose of wastewater delivered by contracting local agencies. IEUA's facilities serve seven contracting agencies: the cities of Chino, Chino Hills, Fontana, Montclair, Ontario, Cucamonga Valley Water District and Upland. A system of

regional trunk and interceptor sewers convey sewage to regional wastewater treatment plants, which are all owned and operated by IEUA (see Chapter 5). Local sewer systems are owned and operated by local agencies.

6.4 WASTEWATER TREATMENT PLANTS

IEUA operates four regional water recycling production plants: (Regional Plant No. 1 (RP-1), Regional Plant No. 4 (RP-4), Regional Plant No. 5 (RP-5), and the Carbon Canyon Water Reclamation Facility (CCWRF). A fifth treatment plant, RP-2, was decommissioned in 2004 because it was in a potential flood zone because of the Prado Dam project.

RP-1

Regional Treatment Plant No. 1 began operation in 1948 through a joint powers agreement between the cities of Ontario and Upland. IEUA, then known as Chino Basin Municipal Water District, purchased RP-1 in January 1973. It's the current capacity is 44 MGD and is projected to be expanded to an ultimate of 60 MGD after 2020 (IEUA Wastewater Facilities Master Plan, 2002). RP-1 serves all or part of the Cities of Ontario, Rancho Cucamonga, Upland, Montclair, Fontana and unincorporated areas of San Bernardino County.

RP-2

Regional Treatment Plant No. 2 (RP-2) began operation in 1960 to serve the City of Chino and the Chino Hills area. It was expanded to 5 MGD to increase capacity and to meet stringent water quality requirements. Because RP-2 sits in a flood prone area, much of the facility has been shut down and all liquid wastes diverted to the new RP-5 facility. RP-2 continues to handle wastewater biosolids generated by RP-5 and CCWRF.

CCWRF

The Carbon Canyon Wastewater Reclamation Facility (CCWRF) has been in operation since 1992. The recycled water plant capacity is 11.4 MGD, while solids are treated at RP-2. CCWRF serves the cities of Chino, Chino Hills, Montclair and Upland.

RP-4

Regional Treatment Plant No. 4 was completed in 1997. This facility was recently expanded to 14 MGD. RP-4 serves the Cucamonga Valley Water District, the City of Fontana and unincorporated areas of San Bernardino County in the northeast portion of the IEUA service area.

RP-5

Regional Treatment Plant No. 5 (RP-5) began operation in March 2004. The 16.3 MGD plant serves existing development and the planned development occurring in the cities

of Chino, Chino Hills and Ontario. Initial investigations have occurred for the expansion of RP-5 to 21 MGD.

REGIONAL RECYCLED WATER DISTRIBUTION SYSTEM FLEXIBILITY AND RELIABILITY
The configuration for the Regional Recycled Water Distribution System is planned as a looped, interconnected system to ensure supply reliability to customers and to maximize the delivery flexibility to recharge facilities.

Figure 6-1 shows the location of regional wastewater treatment plants and the existing and potential recycled water distribution lines.

As shown in Table 6-2, the combined production of the projected wastewater treatment plants, by 2035, are expected to produce approximately 83,000 AF of water (75 mgd).

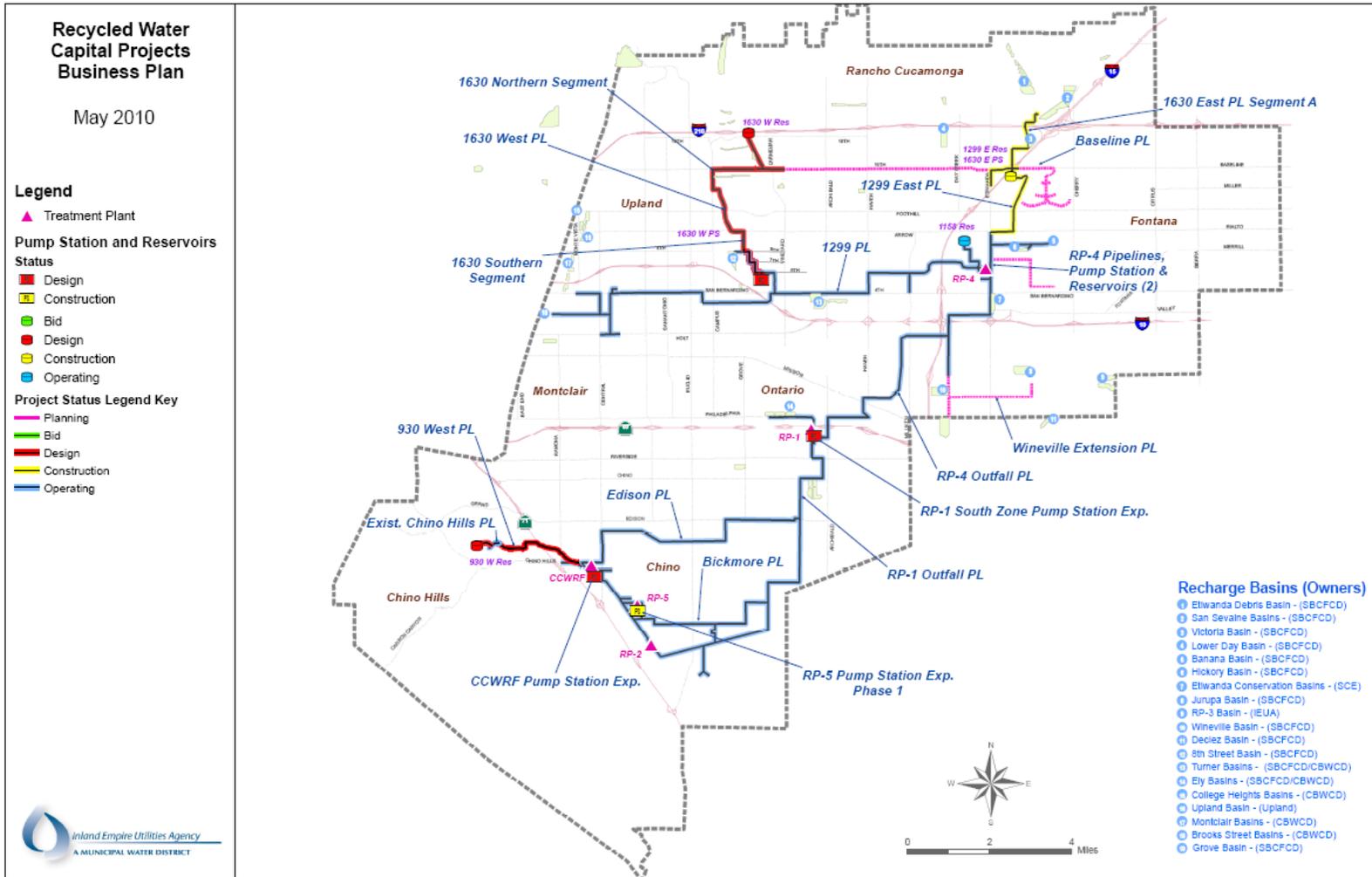
**Table 6-2
 Potential Recycled Water Supply**

Regional Plants	Year 2015		Year 2020		Year 2025		Year 2030		Year 2035	
	Plant Capacity (MGD)	Plant Flow (MGD)								
CCWRF	11.4	7.5	11.4	8.6	11.4	9.3	11.4	10.1	11.4	10.8
RP-1	44.0	29.6	44.0	30.1	44.0	31.0	44.0	32.5	44.0	34.0
RP-4	14.0	11.5	14.0	12.6	14.0	13.8	14.0	13.9	14.0	13.8
RP-5	16.3	10.5	16.3	11.6	16.3	12.3	16.3	13.9	16.3	15.9
Total	85.7	59.1	85.7	62.9	85.7	66.4	85.7	70.4	85.7	74.5

All of IEUA’s wastewater treatment plants produce recycled water that meets or exceeds the requirements of the State of California Department of Health Services (DHS) Title 22 for recycled water. All wastewater goes through a treatment process before being discharged or reused.

The treatment process begins with raw sewage that is collected from the local cities. The raw sewerage is passed through screening and grit removal units, primary clarifiers, aeration basins, secondary clarifiers, chemical addition, tertiary filters, chlorination, and finally dechlorination facilities prior to discharge. Some of the effluent flow is placed into the nearby creeks and allowed to flow ultimately into the Santa Ana River where it is recharged into Orange County’s groundwater basin. The other flows are pumped into IEUA’s recycled water distribution system for reuse.

**Figure 6-1
Recycled Water Distribution Lines and Regional Plants**



Solids removed from the liquid treatment processes are thickened and stabilized in anaerobic digesters before being dewatered and transported to the Agency's composting facility in Rancho Cucamonga which is a joint venture with Los Angeles County Sanitation District.

IEUA maintains an EPA/State of California approved industrial pre-treatment program for industrial discharges to the sewage system that requires dischargers to comply with water quality objectives and to submit periodic monitoring reports to the Agency.

IEUA produces a supply of highly polished tertiary-treated water suitable for irrigation, industrial water supply, groundwater recharge, environmental enhancement and unrestricted recreation use such as boating and fishing.

California Water Recycling Policy

Commencing with Chapter 7, Article 1, (Subsection 13500 et seq.) of Porter-Cologne, is known as the "Water Recycling Law," and is stated, in part, as follows (Subsection 13511):

"The legislature finds and declares that a substantial portion of the future water requirements of this state may be economically met by beneficial use of recycled water.

The legislature further finds and declares that the utilization of recycling water by local communities for domestic, agricultural, industrial, recreational, and fish and wildlife purposes will contribute to the peace, health, safety, and welfare of the people of the state. Use of recycled water constitutes the development of "new basic water supplies".....

6.5 EXISTING RECYCLED WATER PROGRAM

Currently, IEUA produces about 60,000 AFY (53 MGD) of recycled water annually. In 2009, recycled water use totaled about 32,362 acre-feet (AF) of which 12,970 AFY was used for outdoor irrigation, 2,106 is used for industrial processes, 10,993 was used for agriculture and 6,294 AF for groundwater recharge. As a result, of a revised region wide permit, recharge will increase rapidly over the next few years. The remaining supply of recycled water, about 32,638 AF, was discharged to the Santa Ana River for reuse in Orange County.

The recycled water used comes from all of IEUA's wastewater treatment plants. A transmission line connects RP-1 and RP-4 and serves as part of the backbone system for recycled water use in the northern portion of IEUA's service area. Recently two large pipeline (Edison and San Antonio Channel Pipelines) were constructed to provide water to areas of Ontario, Chino and Montclair. Another transmission line project tied RP-1 in to RP-5 and Carbon Canyon. This system provides water for irrigating parks and golf

courses. CCWRF's distribution system delivers water through 21,400 linear feet of pipe, to the cities of Chino and Chino Hills. Currently, there are 560 recycled water connections to the recycled water distribution system.

STATEMENT OF REUSE

“Recycled water can be used for a number of applications including Irrigation, Industrial Processes, Groundwater Recharge, and Environmental Enhancement. The goal of the IEUA is to achieve maximum reuse of all available recycled water.”

6.6 RECYCLED WATER PROGRAM IN DEVELOPMENT

Available recycled water supplies are projected to reach 83,000 AFY in 2035. In conformance with the 1969 Santa Ana River Judgment, a minimum of approximately 17,000 AFY of water will be discharged to the Santa Ana River. This leaves approximately 66,000 AFY of recycled water available for beneficial reuse within the IEUA service area by 2035.

IEUA's overall goal is to achieve maximum reuse of all available recycled water. In the short term, the primary focus of IEUA's recycled water program will be the connection of industrial and landscape customers and development of facilities to ensure cost-effective delivery of recycled water to groundwater recharge spreading sites. In the long term, IEUA seeks to construct a “looped” distribution system that will interconnect IEUA water reclamation plants, ensure direct supply reliability to customers and maximize the flexibility to recharge all surplus recycled water in flood control spreading grounds.

The current distribution system is comprised of several regional pipelines that have been constructed to serve IEUA's wastewater treatment plants. Recognizing that separate pumping stations, independent pressure zones (800, 930, 1050, 1158, 1299 & 1670) , and multiple control interfaces will ultimately lead to overly complex and costly operations, the concept of a large, fully integrated (regional) distribution system was developed. As shown in Figure 6-1, the existing and proposed facilities will provide the ability to provide recycled water to major industrial and municipal users while delivering recycled water, storm water and imported water to groundwater recharge basins throughout IEUA's service area.

NEED FOR REGIONAL RECYCLED WATER DISTRIBUTION SYSTEM

- *More dependable local supplies*
- *Reduced imported water dependence*
- *Drought-proofing the Basin*
- *Reduce likelihood of water rationing*
- *Lower cost of water*
- *Lower sewer rates*
- *Provide economic incentives to attract new jobs and industry*

Recycled water used for groundwater recharge will be blended with MWD's imported SWP supplies and local storm water, consistent with the water quality requirements of the Chino Basin Watermaster's Optimum Basin Management Plan, Santa Ana Regional Water Quality Control Board's Basin Plan and the requirements of the State of California Department of Health Services (DHS) requirements.

Depending on basin specific measurements, up-gradient ground water migration data the blending ratio will be calculated to achieve up to 50% with all other sources of water as determined by DHS over a 10 year period. Currently IEUA can recharge 14,000 acre-feet per year as more basins are connected to recycled water and the underflow calculation is formalized more recycled water will be recharged. Additional facilities, including the development/modifications of new groundwater recharge basins, and installation of additional pumping capacity, will be needed to achieve the long term water recycling goals for the region. As more and more direct use customers are connected ground water recharge will be operated to ensure availability for direct reuse.

Development of local recycled water facilities will be the key to expanding the direct use of recycled water. Direct uses include irrigation for landscaping, industrial process and cooling, and recreational uses such as decorative fountains. As the recycled water facilities expand for the first time into cities such as Fontana and Upland, IEUA will be looking to the local water providers to construct sufficient recycled water facilities that will reduce their dependence on imported water from MWD's Rialto Feeder.

All future direct use (landscape and industrial customers) of recycled water will be given priority service over recharge deliveries. Recharge will be credited based upon the annual flow contributions for all contracting agencies on a pro-rata basis.

In order to deliver the ultimate demand for recycled water additional regional pipelines, reservoirs, booster stations, and land parcels will be required.

6.7 RECYCLED WATER PRICE INCENTIVES

IEUA is developing an extensive Regional Recycled Water Program consisting of advanced wastewater treatment and recycled water distribution system. This system is described in detail in Chapter 5 and in Recycled Water Implementation Plan (IEUA July 2005).

As the agency responsible for treating and disposing of wastewater throughout most of the Chino Basin, IEUA maintains a special pipeline for industries which produce wastewater that cannot be treated with conventional technologies before being placed ultimately in the Santa Ana River or being used in IEUA Recycled Water Program. This pipeline is referred to as the Non-reclaimable Waste (NRW) Line. The NRW Line carries non-reclaimable wastewater to the Los Angeles County Sanitation Districts facilities in Whittier for treatment and disposal. Since industrial water use represents a significant potential recycled water demand in the IEUA service area, the industries discharging to the NRW system represent the majority of industries in the service area which use significant amounts of water for non-potable purposes. This makes these industrial customers ideal candidates for recycled water use and expansion.

- Industrial use of recycled water is approved by the California Department of Health Services and mandated by the California Water Code 13550.
- In order to encourage recycled water use among NRW Line users, IEUA has established several incentives:

Recycled Water Rate – IEUA’s rate for recycled water delivered to a contracting agency is \$95 per acre-foot for direct deliveries and \$115/AF for groundwater recharge. The retail water utilities that have established a recycled water rate are offering it at a 30% to 50% discount from their potable rate. The amount of discount depends on each agency’s existing potable rate, existing potable infrastructure revenue needs and capital improvements needed to convey recycled water from IEUA’s regional system to individual customers. In addition, IEUA currently offers a discount to NRW customers using recycled water of 25% of IEUA’s recycled water rate (\$50 per acre foot). Recycled water rates will be increased in July 2011.

Even with the increased rates increased to \$115/AF for direct deliveries and \$145/AF for groundwater recharge, the Agency’s rate is still one of the lowest rates in the region. IEUA has proposed yearly increases consistent with the increase in pumping costs that are expected to increase 5% per year.

In 2010, IEUA performed a rate survey with other wholesale agencies in Southern California; the results of the survey are shown in Table 6.3. IEUA has a considerably lower rate for recycled water even with the proposed increases.

**Table 6-3
IEUA 2010 Recycled Water Rate Survey Results**

Agency	Type	Notes	Rate \$/AF
Calleguas Municipal Water District	Wholesale	Base Rate	\$750
Central Basin Municipal Water District	Wholesale	Tiered Rates	\$ 275 - \$ 497
Eastern Municipal Water District	Wholesale	Tiered Rates	\$ 181 - \$ 288
Inland Empire Utilities Agency	Wholesale	Base Rate	\$95
Irvine Ranch Water District	Retail & Wholesale	Base Rate	\$449
MWD	Wholesale	Tiered Rate	\$0 - \$250
Orange County Water District	Wholesale	Green Acres rate	\$326
Upper San Gabriel Water District	Wholesale	Various Customer Agreements	\$ 315- 360
West Basin Municipal Water District	Wholesale	Tiered Rates	\$ 501 - 1,195

Reliability – Recycled water is a reliable resource not subject to droughts or imported water availability. Existing potable service also remains available as a backup to recycled water, improving reliability.

Mandatory Use – In May 2002, the Board adopted Ordinance No. 75 establishing incentives and mandating the use of recycled water. Under the provisions of Ordinance No. 75, which is consistent with the California Water Code (Sec 13550) and the State Water Resources Control Board guidelines, potential recycled water customers who do not use recycled water when it is available are subject to a 50% surcharge on their potable water rate.

Technical Assistance – IEUA provides technical assistance to prepare necessary engineering reports and coordinate DPH approval of recycled water use at each customer’s site. IEUA has also retained experts in industrial water use and quality to assist customers in assessing operational needs associated with using recycled water.

Financial Assistance – Under the Regional Recycled Water policy adopted in September 2000, IEUA offers financing for capital improvements at customers facilities required to separate potable from non-potable water systems.

Increased NRW discount – NRW Line customers who use recycled water when available or agree to use when available will be eligible for the proposed NRW “pass through” rate. The NRW customer will otherwise pay the current NRW rates. Those NRW customers not using recycled water or not agreeing to use it will be retroactively credited the difference paid between the current rate and the “pass through” rate at the time they begin using recycled water, with the credit to first cover the cost of on-site retrofit and engineering report preparation.

6.8 FUNDING

Implementation of the Regional Recycled Water Program has been coordinated with the availability of state and federal funds to minimize use of regional capital funds. IEUA has adopted a Ten-Year Capital Improvement Plan (CIP) which has a budget that breaks out the federal, state and local funding for recycled water project over the next ten years. Local funding will be through the Regional Capital Fund, State grants and loans through DWR and the State Water Resources Control Board, and Federal grant funding through the US Bureau of Reclamation’s Title XVI program.

Capital funding needs for the Regional Recycled Water Distribution System are estimated at \$101.5 million over the next ten years. This includes grant funding from California’s Proposition 13--Santa Ana River Watershed Funds (\$19 million awarded in 2000 for Phase I, additional funds were sought for remaining projects), California’s Proposition 13—State Water Resources Control Board water recycling grant program (\$15-\$20 million, applications pending), and the U.S. Bureau of Reclamation Title XVI Grants (\$20 million for water recycling and \$50 million for construction of desalters, Congressional authorization pending).

As more supplemental funding becomes available, the recycled water infrastructure becomes more cost-effective to construct. IEUA staff evaluated the capital funding needs for the Recycled Water Distribution System and determined that it can be funded through the Regional Program without an additional increase in the Regional Capital Capacity Reimbursement Amount (connection fee). This provides a significant opportunity for local retail agencies to implement the OBMP (capital costs) without impacting IEUA’s water and sewer rates and charges.

Repayment of the various loans will occur through recycled water sales revenues. These revenues consist of sales of recycled water (current IEUA wholesale rate and through the MWD Local Project Program (LPP). With certain contractual limitations, MWD provides a payment of \$154 for each acre-foot of recycled water that is directly reused (not groundwater recharge) up to 13,500 AF cap.

RECYCLED WATER PROGRAM IS CONSISTENT WITH:

- *Chino Basin Watermaster OBMP/Peace Agreement*
- *Legislative Policy (Water Code Section 13550)*
- *State Water Plan (Bulletin 160-1998)*
- *California Water Resources Control Board*
- *CALFED Bay-Delta Program*
- *State of California Recycled Water Task Force Report*
- *Colorado River 4.4 Plan*
- *MWD's Integrated Water Resources Plan*
- *SAWPA's Integrated Watershed Plan*
- *Santa Ana Regional Water Quality Control Board Basin Plan*
- *United States Bureau Reclamation's Southern California Comprehensive Water Reclamation and Reuse Study*

6.9 ENCOURAGING RECYCLED WATER USE

IEUA has organized a regional program to encourage water reuse within its service area. The establishment of new supplemental funding sources through federal, state and regional programs now provides significant financial incentives for local agencies to develop and make use of recycled water. This will remove a significant obstacle to the implementation of recycling water projects and programs.

IEUA is working closely with its local retail agencies to complete the regional recycled water distribution program that will maximize water reuse for the entire IEUA service area. Staff of all the agencies meets monthly to coordinate the master planning of the recycled water system to ensure that optimal capital investments are prioritized and that all potential customers are contacted regarding connection to the recycled water system. IEUA is also working with local retail agencies to ensure that all new residential, commercial and industrial developments have dual plumbing so that recycled water (when available) can be used for outdoor irrigation and other non-potable water uses.

In addition, IEUA has proposed the following incentives to encourage the use of recycled water. These include the following:

- A discount for Non-Reclaimable Water service users (to promote removal of salts from the groundwater basin);
- Shared costs for service connections, water meters, and signage;
- Loans to help finance local (non-regional) infrastructure and retrofit projects that contribute to use of recycled water;

- Technical assistance with engineering, regulatory and institutional issues and with preparation of funding applications;
- Guarantee of recycled water supply reliability, especially during droughts.