Inland Empire Utilities Agency
Regional Recycled Water Program
2007 Idaho Wastewater Reuse Conference

MWH

June 2007

Presented by
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AGENCY MISSION

The Mission of the Agency is to supply imported and recycled water, collect, treat, and dispose of wastewater, and to provide other utility-related services to the agencies it serves. To provide these services in a regionally planned, managed, and cost-effective manner which protects public health and environment, and maintains a high level of public awareness.

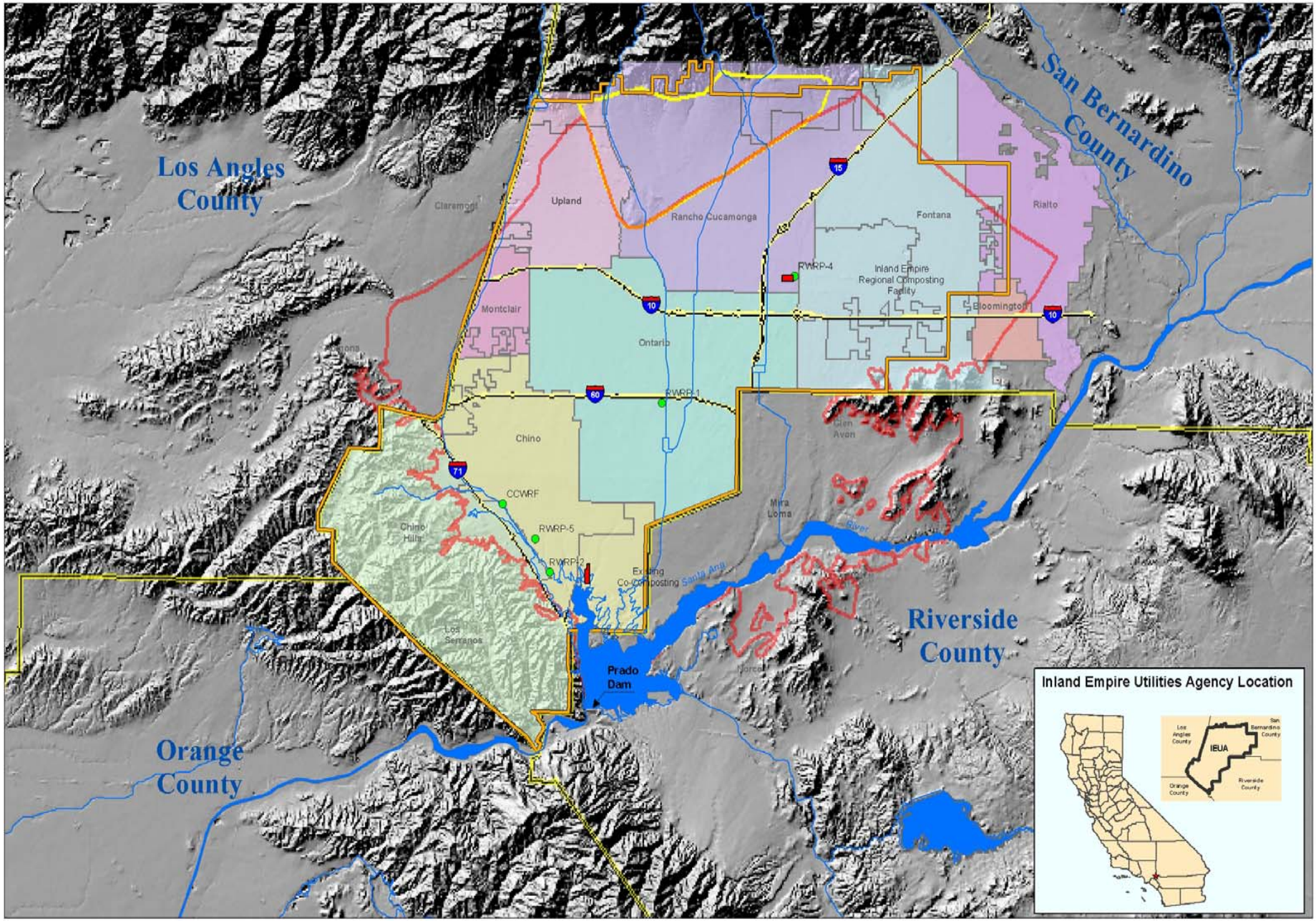

Nevada
Arizona
Kern
Santa Barbara
Ventura
Los Angeles
San Bernardino
IEUA
Orange
Riverside
San Diego
Imperial

IEUA Profile: Municipal Water Agency

Regional wastewater treatment and *wholesale* distributed water for 7 cities, two water districts, and two water companies

- Imported water supply distribution
- Five regional wastewater treatment plants
- Two non-reclaimable wastewater sewer pipeline systems (NRW & SARI)
- Two reverse osmosis desalination plants (joint power authority)
- Biosolids and organics management, the State's first completely-enclosed composting facility (In Start Up)
- Recycled water program
- Water conservation program
- Groundwater recharge with stormwater, imported and recycled water

Overall IEUA Service Area

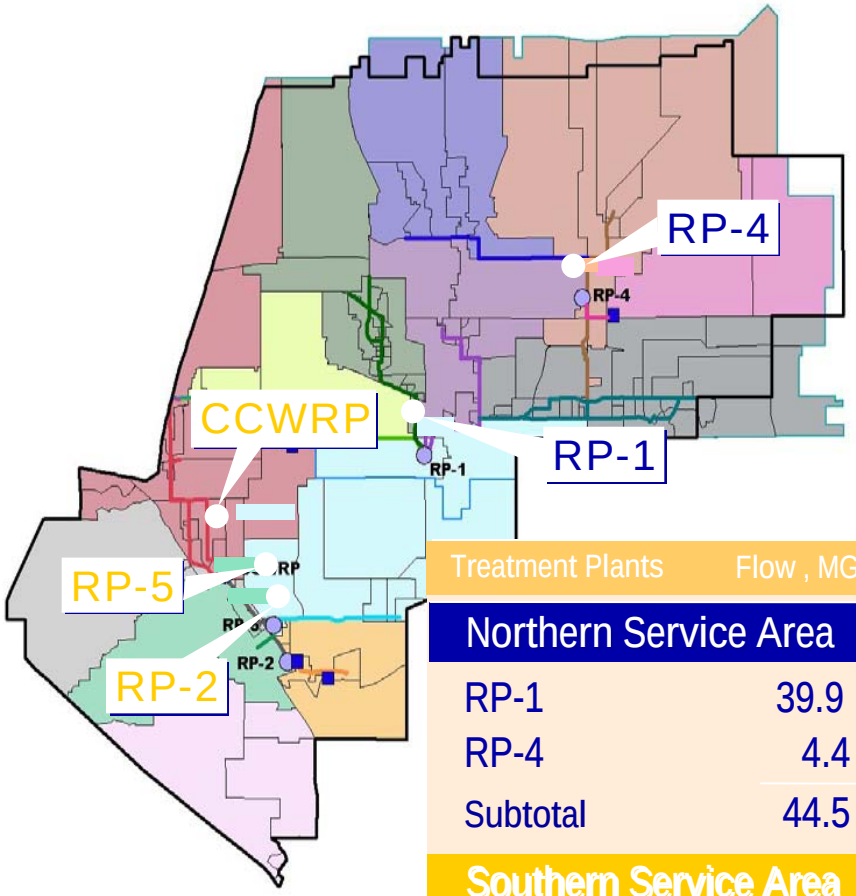


IEUA Recycled Water History

- RP-1 Deliveries to Prado Park, Golf Course, Westwind Park since early 1970's
- Regional Recycled Water Program Evaluated in 1992
- Early 1990's Carbon Canyon RW System
- 1998 Permit for Ely Basin Recharge
- 2002 Recycled Water Feasibility Study
- 2002 Phase I Construction
- 2005 Recycled Water Implementation Plan
- 2005 Phase II Construction
- 2006 3 billion gallons served (not Big Macs)

Existing Facilities

- Five Regional Water Recycling Facilities
- Conveyance
  - 66.4 Miles of Regional Trunk Sewer System
  - 62 Miles of Non-Reclaimable Waste (NRW) System
- 1 Reservoir
- 3 Pump Stations



Treatment Plants	Flow , MGD
Northern Service Area	
RP-1	39.9
RP-4	4.4
Subtotal	44.5
Southern Service Area	
CCWRF	9.9
RP-2/RP-5	4.2
Subtotal	14.1
Total Treated	58.4
NRW System Flows	4.3
Total Region	62.7

THE NEED FOR RECYCLED WATER

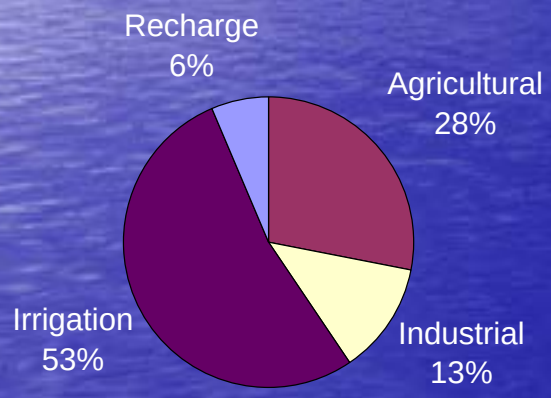
Densely Populated Urban Environment

Southern California (South of Gabriel Mountains)

- **Home to 7% of US population**
- **Occupies only 0.6% of US land**

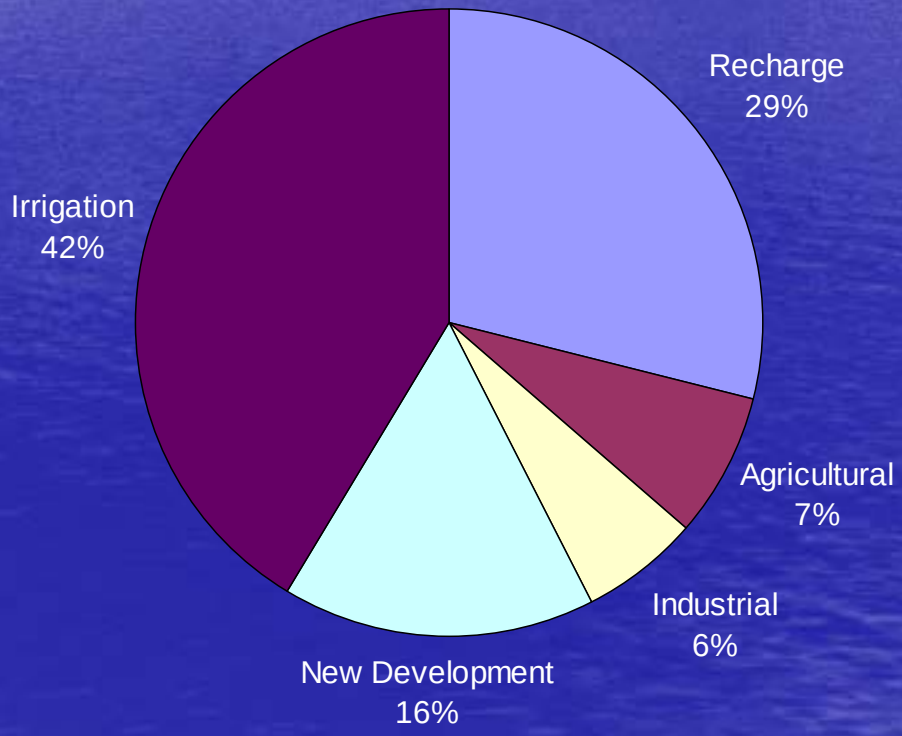
Explosive Growth Creates Recycled Water Market

800,000 people (2003)



9,500 acre-ft/yr

1,200,000 people (2025)



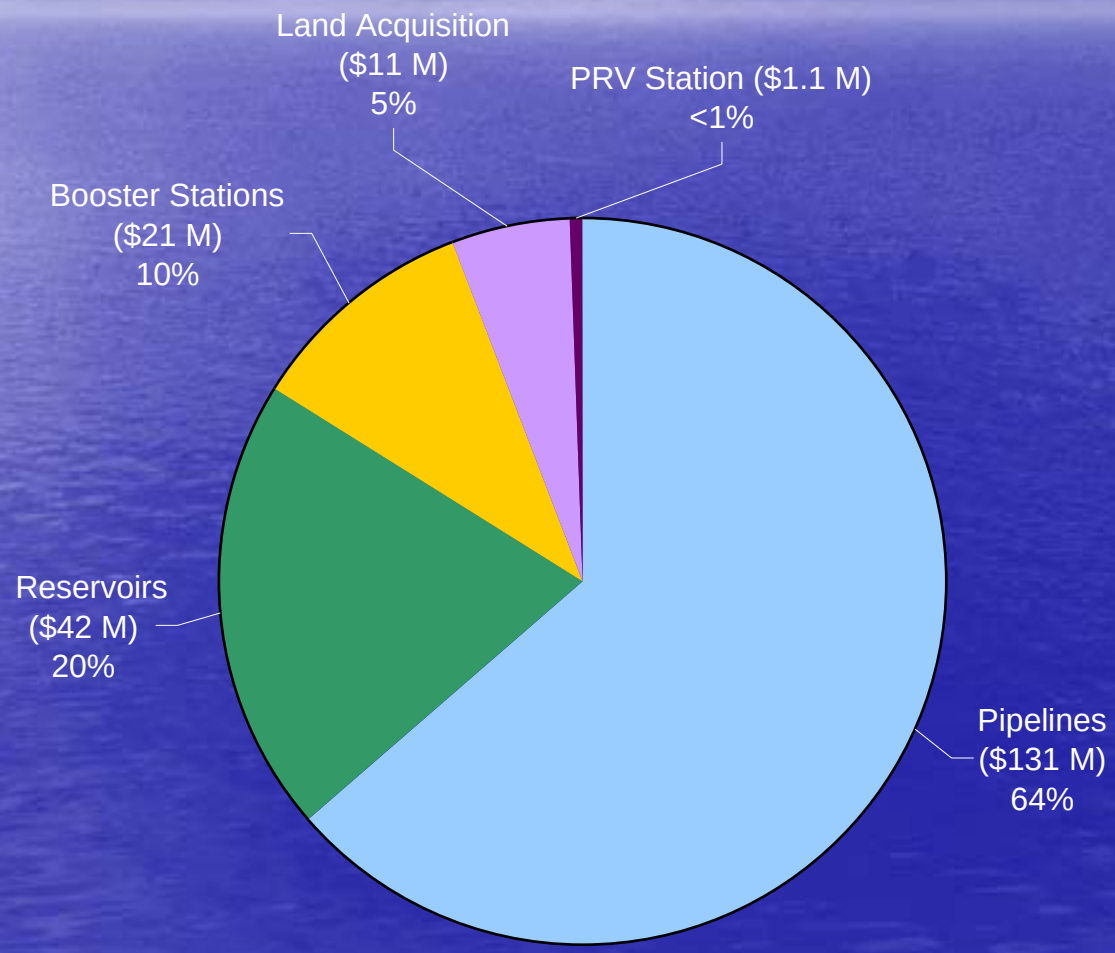
93,000 acre-ft/yr

2005 Recycled Water Implementation Plan

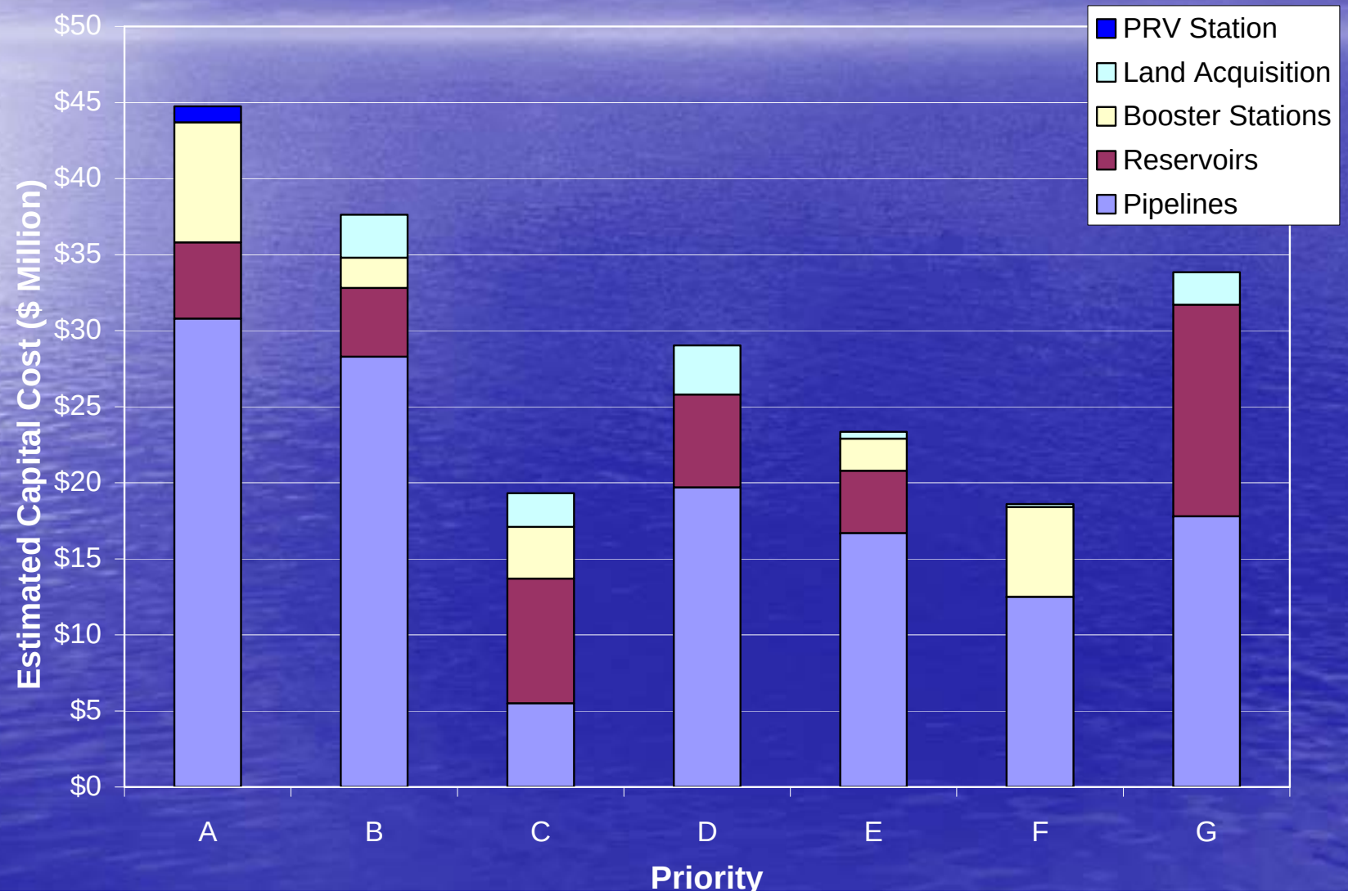
Focus on Planning Brings Optimized Results

- Purpose is to Plan Recycled Water System to Build-Out (Year 2025)
- Key Planning Issues:
  - Pressure Zones
  - Planning Horizon
  - Peaking Factors
  - Energy Efficiency

Recycled Water Implementation Plan: Costs for Facilities: $200 Million



Recycled Water Implementation Plan Phasing



Pressure Zones Match Existing Potable Water Zones

- 7 Water Purveyors = 65 Potable Pressure Zones
- Ground Elevation from 560 ft to 2,700 ft MSL
- 13 Recycled Water Pressure Zones Developed
- Pressure Zones are Equal or Slightly Higher than Potable Systems

Planning Horizon Impacts Capital Costs

- 15% Cost Differential for Sizing Pipelines for Build-Out versus 10-Year Planning Horizon

Cost Item	10-Year	Build-Out	Cost Differential
Reservoir Cost (million $)	$60.9	$60.9	0.0%
Pump Station Cost (million $)	$16.0	$16.0	0.0%
Pipeline Cost (million $)	$79.6	$91.2	14.6%
Total Construction Cost (million $)	**$156.5**	**$168.1**	7.4%

Peaking Factors Impact Facility Sizing

Alternative	Irrigation PF = 7.8	Irrigation PF = 6.5	Change in Costs
Reservoir Cost (million $)	$60.9	$52.7	-13.5%
Pump Station Cost (million $)	$16.0	$16.0	0.0%
Pipeline Cost (million $)	$79.6	$77.6	-2.5%
Total Construction Cost (million $)	**$156.5**	**$146.3**	**-6.5%**

- Changes Due to Peaking Factors:
  - No Change in Pump Station Cost
  - Minimal Increase in Pipeline Cost
  - Significant Increase in Reservoir Cost: Reservoirs Should be Phased

Energy Costs Saved by Evaluating Pipeline Velocities

- Energy Costs are Going Up
  - $0.15/kWh to $1/kWh peak?
- Pipe Velocities Effect Energy Costs
  - Example of Sultana Pipeline and Booster Pump Station (30,000 gpm)

Category	30-inch Pipeline	36-inch Pipeline	Difference
Pipe Velocity	7.2	5.0	
Capital Cost	$16,000,000	$19,100,000	($3,100,000)
Booster Pump TDH (ft)	435	390	45
Power (hp)	2,570	2,310	260
Energy (kWh/yr)	16,821,000	15,081,000	1,740,000
Energy Cost ($/yr)	$ 2,523,000	$ 2,262,000	$ 261,000

Payback = 11.5 years @ $0.15/kWh ; 6.9 years @ $0.25/kWh

Summary of Energy Evaluation

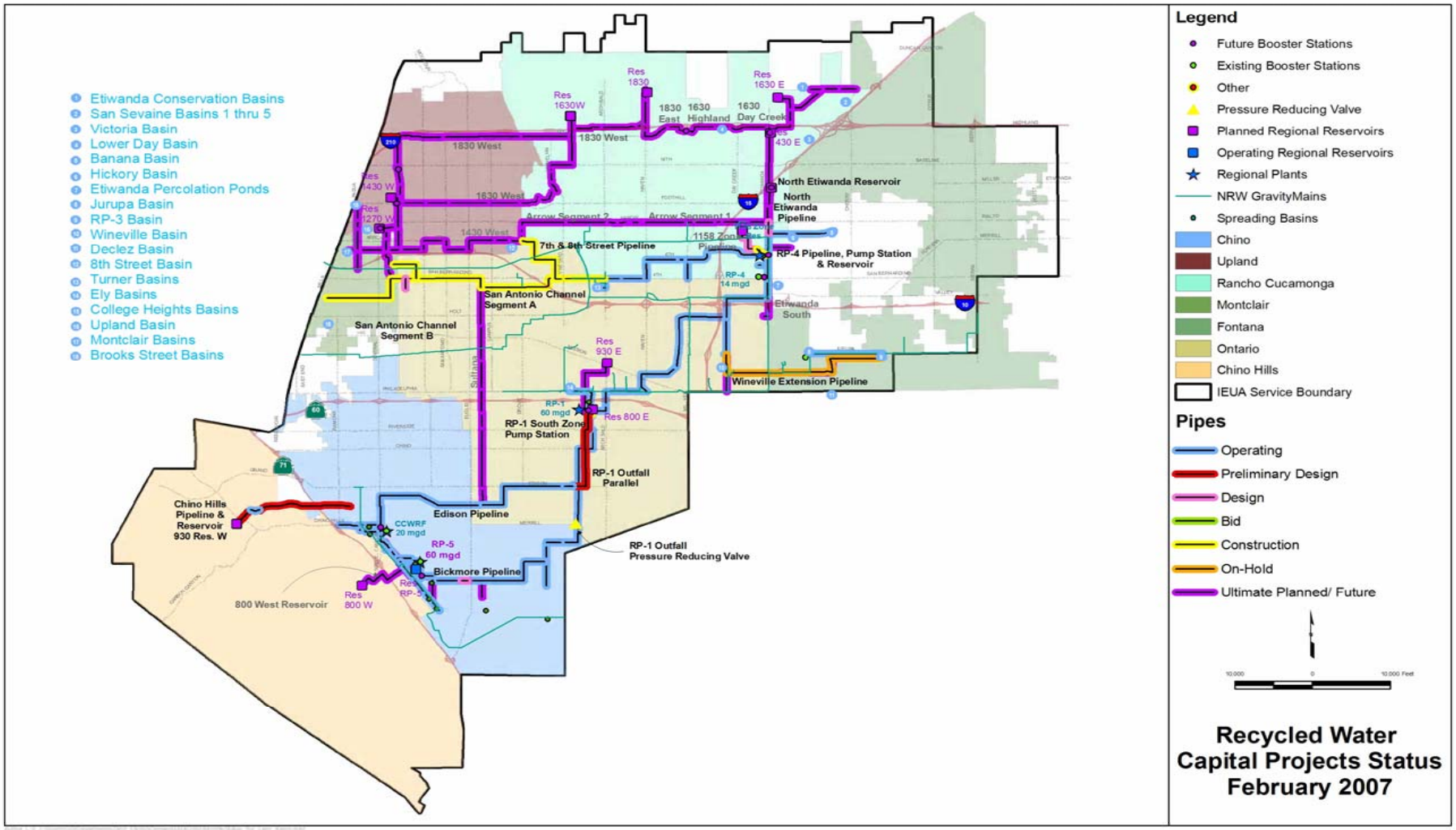
Site Location	Pipe Size Change	Energy Consumption Reduction (kWh/yr)	Savings	Payback (years)
Sultana	30-inch to 36-inch	1,740,000	$261,000	11.5
Edison	30-inch to 36-inch	1,793,000	$269,000	25
San Bernardino PS	Sewer Lift Station	5,100,000	$610,000	11.6

- Life Cycle Cost Analyses are Important
- Some Projects Require Additional Analyses that are Traditionally Done During Pre-Design
- Important for Project Budgeting

Recommendations for Recycled Water System Planning

- Matching Pressure Zones Important
- Sizing Pipelines for Build-Out versus 10-Year Planning Horizon Worth the Additional Cost
- Reservoirs Should be Phased due to Questionable Peaking Factor
- Reduced Pipeline Velocity has Significant Effects on Power Costs
- Life Cycle Cost Evaluations are Important

Planned Regional Recycled Water System



Recycled Water Policy (2000)

"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."

- Water Recycling is synonymous with water reuse, reclaimed water, wastewater reuse, etc. In 1990's the California Legislature adopted Water Recycling as the official designation.

Need for Recycled Water

- 93,000 AFY water demand increase by 2025
- Recycled water uses 2,500 kWh/AF less Energy than State Water Project
- Recycled water supply is drought proof
- Recycled water provides environmental benefits

IEUA Recycled Water Quality

Wastewater Reclamation Plants in Southern California	TDS (mg/l)
IEUA	< 500
Long Beach (LACSD)	690
San Jose Creek (LACSD)	650
Hyperion (City of Los Angeles)	>700

Recycled Water Uses

- IEUA Recycled Water Disinfected Tertiary
- State Department of Health Services Allowed Uses
  - Irrigation (Parks, school playgrounds, medians)
  - Agricultural
  - Industrial and Commercial Facilities
  - Recreational impoundments
  - Groundwater Recharge (Spreading Grounds and Injection)
  - Nearly any use, except direct potable

Customer Development

- **Goal** 200 New Customers by December 31, 2007
  - – 18,000 AFY
- Coordination with Agencies
  - Contact with Customers
  - Coordination of Regional and Local Facility Construction
- Technical Support and Financing
  - DHS Engineering Reports
  - Consultant Expertise in Industrial Process and Irrigation
  - Financing of On-site Retrofit
  - Financing of Local Laterals and Facilities

Current Marketing Activities
Continued

- Industrial Customers
  - Inland Paper Board (1,400 AFY) - January 2008
  - OLS Energy @ CIM (250 AFY) – December 2007
  - Mission Linen (500 AFY) – December 2007
  - Cintas Laundry (250 AFY) – June 2007
  - Crothall Laundry (120 AFY) – July 2007
  - CSI (900 AFY) – July 2007
  - Other NRW Customers
- Irrigation Customers
  - Empire Lakes Golf Course (600 AFY) – March 2007
  - Kaiser Hospital in Ontario (25 AFY) – October 2007
  - 20 CVWD Customers (100 AFY) – November 2007
  - CIM, CIW, and Youth Facility (500 AFY) – July 2007
  - Vellano Golf Course (500 AFY) – December 2007
  - 10 Additional Irrigation Customers (90 AFY) – December 2007

IEUA Regional Policy (2000)

- Regional Facilities (IEUA owned & funded)
  - Serves more than one retail agency
  - Serves a recharge site
  - Connects regional storage or loops regional pipelines
- Local Facilities (local laterals)
  - Serves only one retail agency
  - Owned and funded by retail agency
  - IEUA will finance local facilities

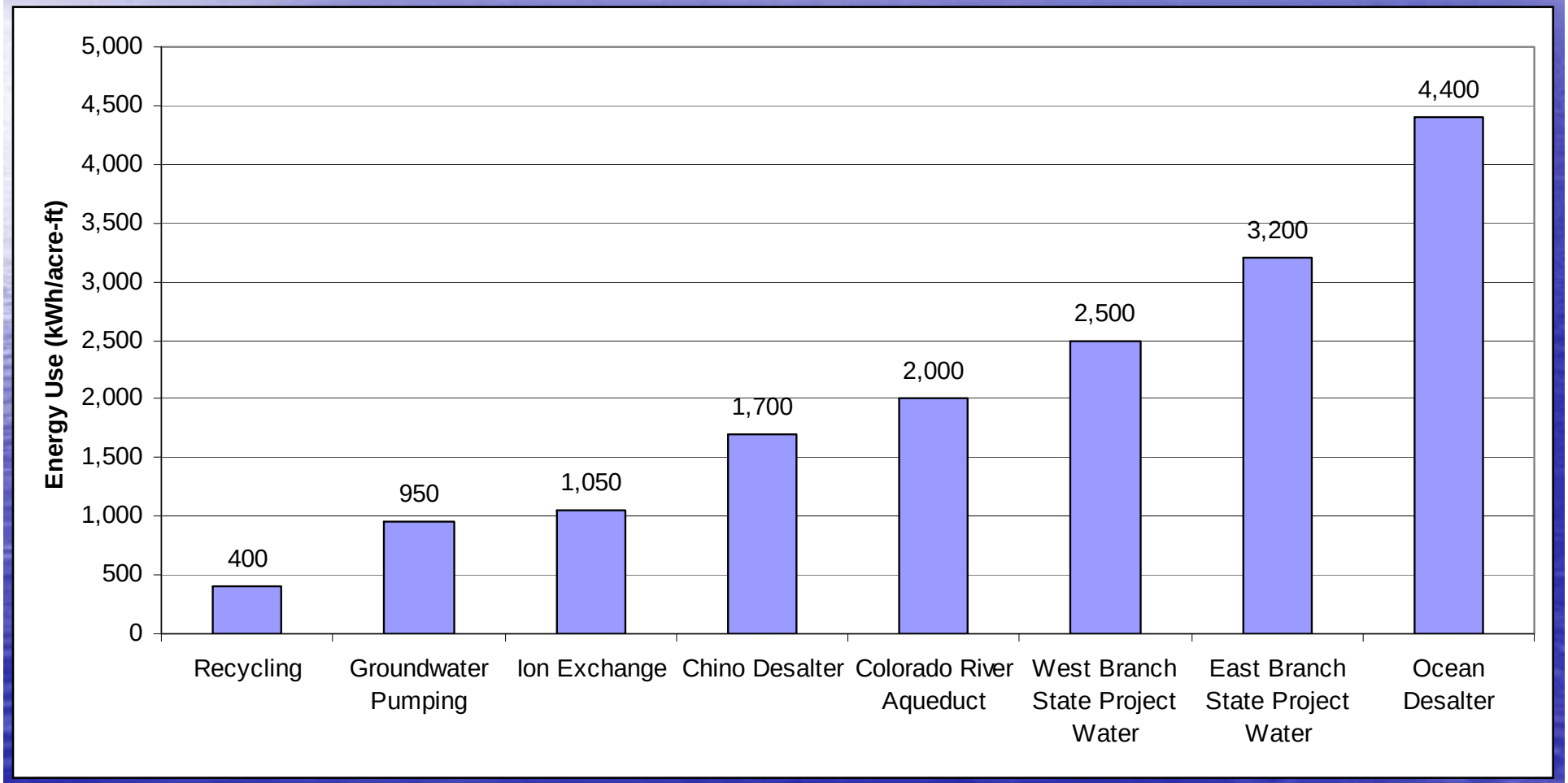
Current Marketing Activities

- 30 Significant Customers Targeted in 2007
  - Recharge
    - Phase I Basins 7,700 AFY – RWQCB Permit on 10/07
    - Phase II Basins 17,000 AFY – Permit Approval 12/07
      (Potential Recharge: 40,000 AFY or more)
  - Agricultural Customers
    - CIM (1,000 AFY) – October 2005 – Connected
    - Chad's Farms (1,150 AFY) – July 2007
    - Li's Farms (800 AFY) – August 2007
    - Chung's Farm (150 AFY) – August 2007
    - Chino Airport West End (600 AFY) – June 2007
    - So. Cal. Ag. Foundation (500 AFY) – July 2007

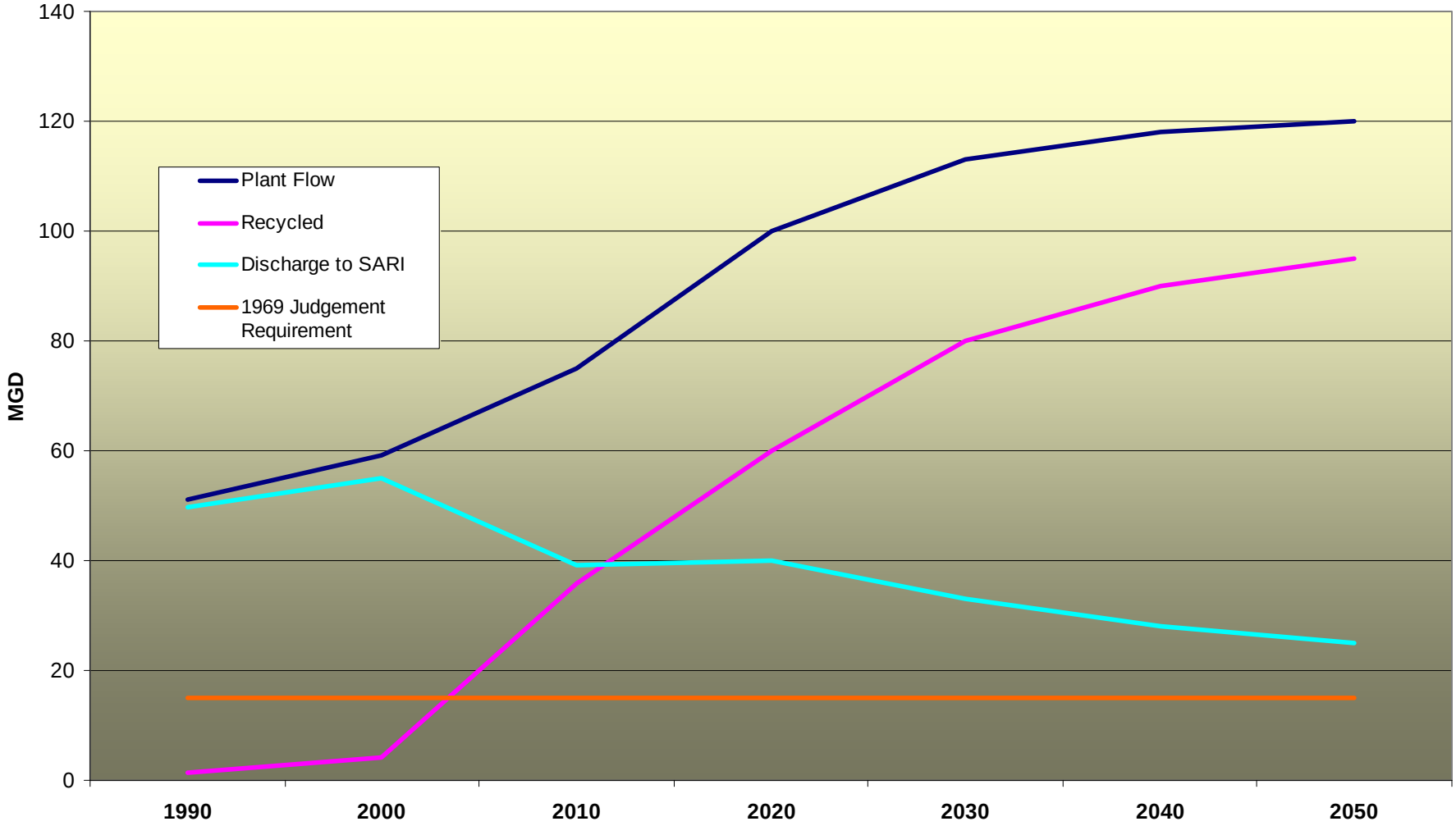
Customer Service/Support

- Coordination with Retail Agency
- Technical Support/Problem Solving
- Quality of Service
  - Water quality
  - Reliability
  - Communication
- Customer Satisfaction Can Be the Best or Worst Salesman

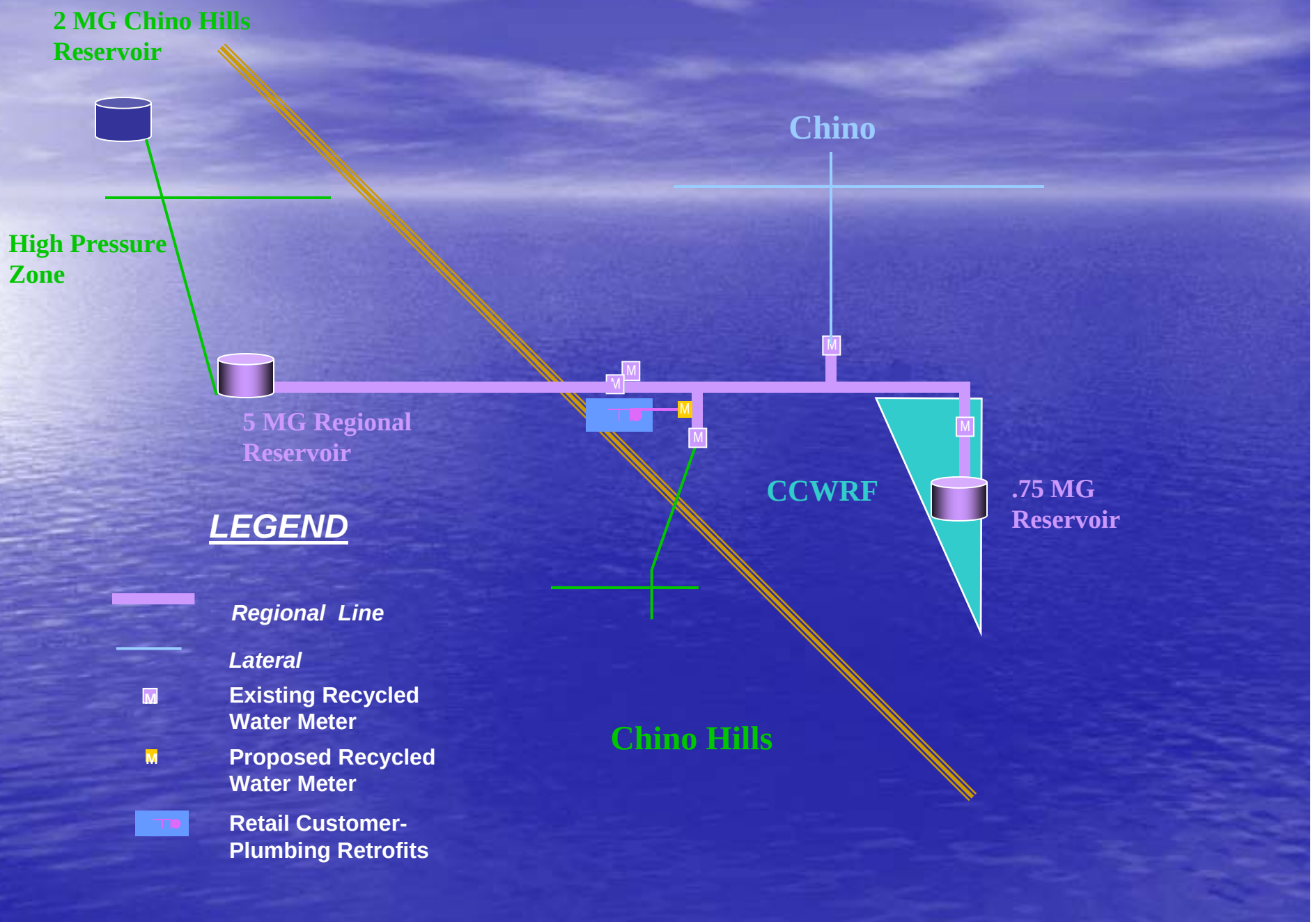
Recycled Water has the Lowest Energy Use

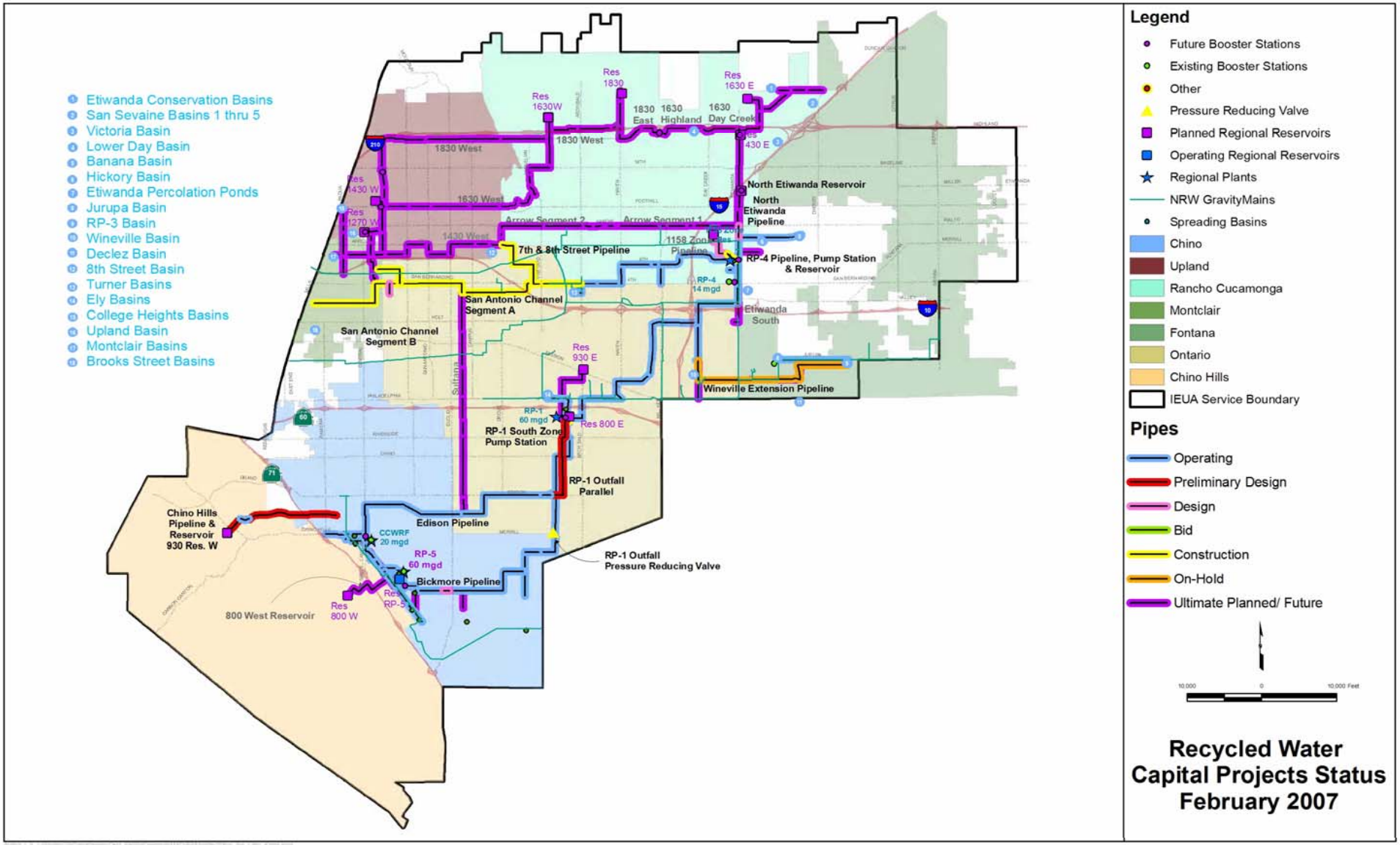


IEUA Forecast Recycled Water Supply/Demand



Recycled Water Regional/Local Facilities Example




1. Etiwanda Conservation Basins
2. San Sevaine Basins 1 thru 5
3. Victoria Basin
4. Lower Day Basin
5. Banana Basin
6. Hickory Basin
7. Etiwanda Percolation Ponds
8. Jurupa Basin
9. RP-3 Basin
10. Wineville Basin
11. Declez Basin
12. 8th Street Basin
13. Turner Basins
14. Ely Basins
15. College Heights Basins
16. Upland Basin
17. Montclair Basins
18. Brooks Street Basins
Res 1830
Res 1630W
1830 East
1630 Highland
1630 Day Creek
Res 1630 E
1830 West
Res 1430 W
1630 West
Res 1270 W
1430 West
Arrow Segment 2
Arrow Segment 1
1158 Zone Pipeline
North Etiwanda Reservoir
North Etiwanda Pipeline
7th & 8th Street Pipeline
RP-4 Pipeline, Pump Station & Reservoir
RP-4 14 mgd
San Antonio Channel Segment A
San Antonio Channel Segment B
Etiwanda South
Res 930 E
Wineville Extension Pipeline
RP-1 60 mgd
RP-1 South Zone Pump Station
Res 800 E
RP-1 Outfall Parallel
Chino Hills Pipeline & Reservoir 930 Res. W
Edison Pipeline
CCWRF 20 mgd
RP-5 60 mgd
RP-1 Outfall Pressure Reducing Valve
Bickmore Pipeline
Res RP-5
800 West Reservoir
Res 800 W
Legend
Future Booster Stations
Existing Booster Stations
Other
Pressure Reducing Valve
Planned Regional Reservoirs
Operating Regional Reservoirs
Regional Plants
NRW GravityMains
Spreading Basins
Chino
Upland
Rancho Cucamonga
Montclair
Fontana
Ontario
Chino Hills
IEUA Service Boundary
Pipes
Operating
Preliminary Design
Design
Bid
Construction
On-Hold
Ultimate Planned/ Future
10,000
0
10,000 Feet
Recycled Water Capital Projects Status February 2007

Member Agency Municipal Use

Municipal Use - Present, 2010 and 2025 Demand			
Agencies	**Present Usage (AFY)**	**2010 Usage (AFY)**	**2025 Usage (AFY)**
Chino	600	3,400	12,800
Chino Hills	200	3,100	6,300
Ontario	700	11,000	17,510
Upland	700	900	2,050
Fontana WD	0	2,600	4,090
CVWD	0	4,000	16,300
MVWD	0	500	1,000
IEUA Groundwater Recharge	7,100	19,500	33,000
Total	**9,300**	**45,000**	**93,050**

Regional Recycled Water Program Summary

Program Phase	Number of Customers	Demand (AFY)	Capital Cost (millions)
Previous System	100	7,420	-
2003/05 (Phase I)	110*	11,100*	$27
2004-2007	190	16,200	$43
2005-2008	220	13,200	$37
2008-2010	440	10,000	$30
2010-2012	210	13,900	$35
2012-2014	140	14,580	$25
Beyond 2014	350	6,600	TBD
Total	**1,900**	**93,000**	**$197**

* Includes potential customers near existing facilities. Current deliveries 9,300 AFY.

Project No.	Project Description (projected completion date)	Budgeted Cost ($ Millions)	State Grant Funding	Federal Grant Funding	SRF Loan	Total Grant/ Loan Funding
1	San Antonio Channel Pipelines (February 2008)	13	3		10	13
2	TP-1 South Zone Pump Station (July 2007)	5	1		4	5
3	RP-4 Reservoirs and Pump Stations (June 2008)	12		5	7	12
4	Edison Avenue Pipeline (Early 2007)	9	7			7
5	Wineville Avenue Pipeline Extension (Oct. 2007)	8.3	1.5		6.7	8.3
6	7th and 8th St. Basin Pipeline (May 2007)	3	2			2
7	Etiwanda Ave. Pipeline, Reservoir, Pump Station (2008)	21		10	11	21
8	RP-1 Outfall Parallel (2010)	10		5	5	10
9	San Sevaine, Etiwanda Basin Pipelines (2010)	22	4		18	22
10	Etiwanda Pipeline South (2009)	4	2		2	4
11	Chino/Chino Hills Zone 800 (2010)	11	3		8	11
12	RP-5/2 Recycled Water Pipelines (Mar. 2007)	3.8				
	Land Purchase for Reservoirs	5				
	Total ($ Millions)	126	23.5	20	70.5	114

Recycled Water Revenue

- IEUA is Wholesale Agency
  - (exceptions – Reliant, Prado Park, IEUA Facilities)
- IEUA Wholesale Rate $60/AF ($75 to non contracting agencies)
- MWD Rebate $154/AF (for direct reuse deliveries above 3,500 AFY)
- Total revenue FY 2006 - $2 million, FY 2016 - $6 million
- Retail agencies benefit – avoided cost of Tier II MWD water at $427/AF

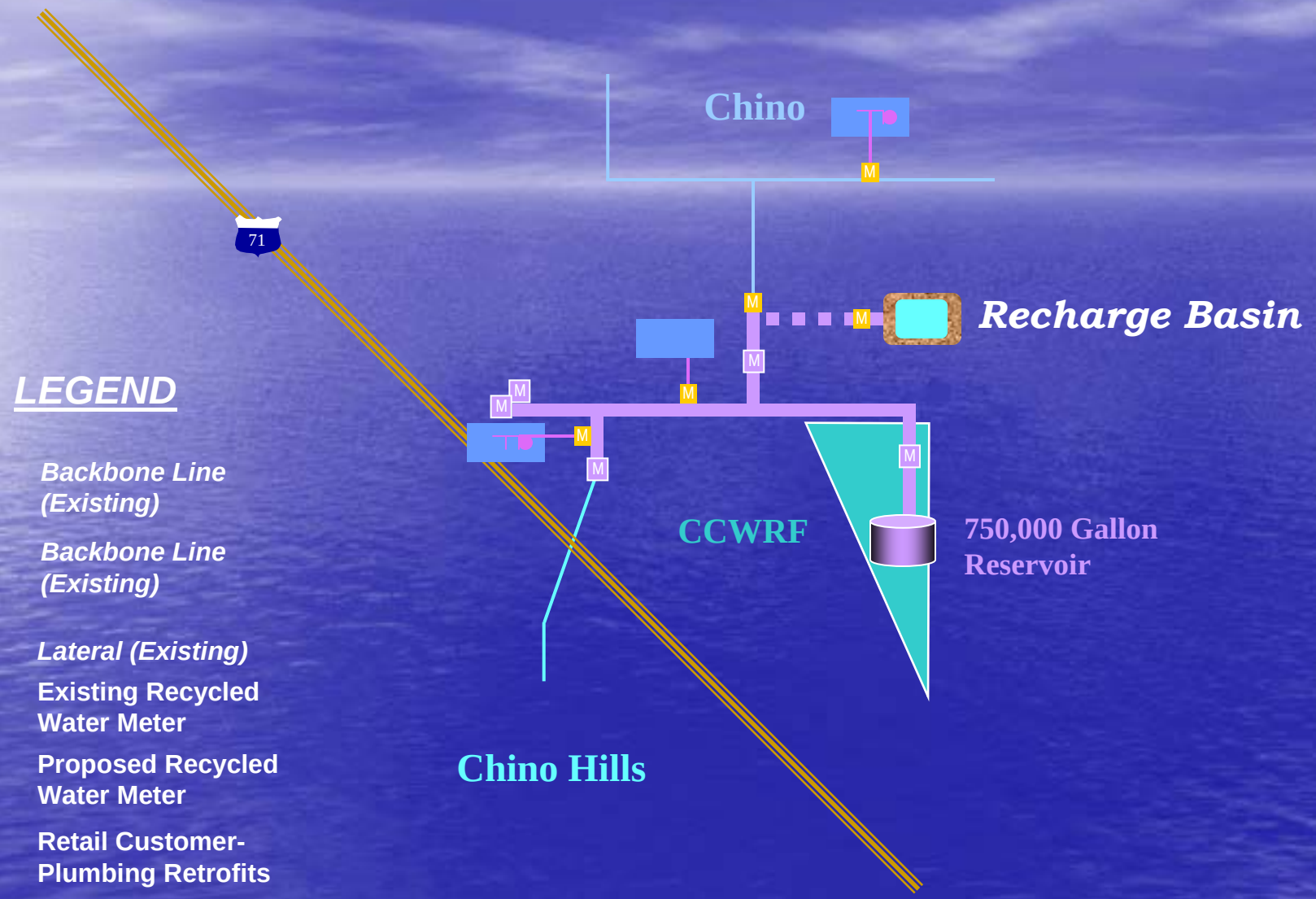
2006-08 Capital Improvement Projects

- 12 Significant Projects - Serves 45,000 AFY

FUNDING

• State/Federal Grand Funding	$43.5 million
• State Loan Funds	$70.5 million
• Local Funding	$12 million
TOTAL Capital Cost	**$126 million**

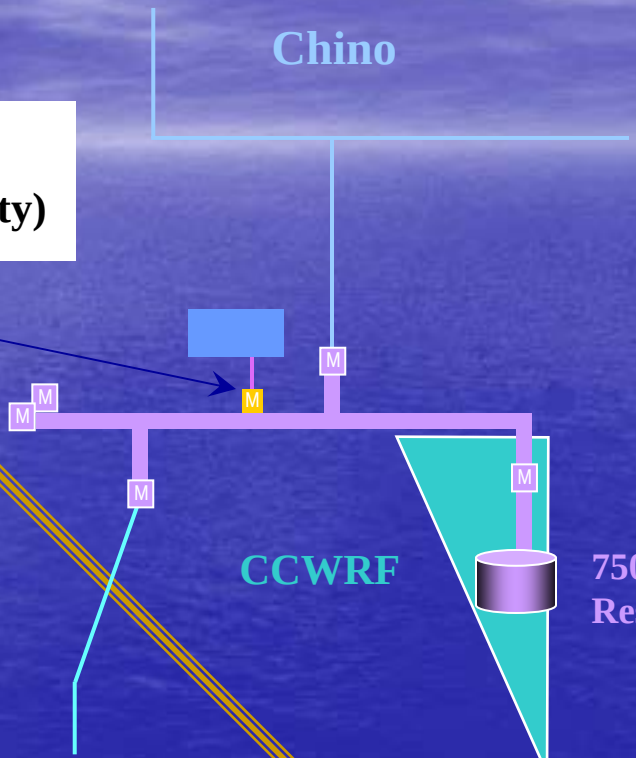
EXAMPLES OF PROPOSED RECYCLED WATER SERVICE



EXAMPLE OF PROPOSED RECYCLED WATER SERVICE RATE FACTORS

- NEW SERVICE OFF BACKBONE SYSTEM AND NO ON-SITE WORK

$60.00
+ Administration Costs (City)



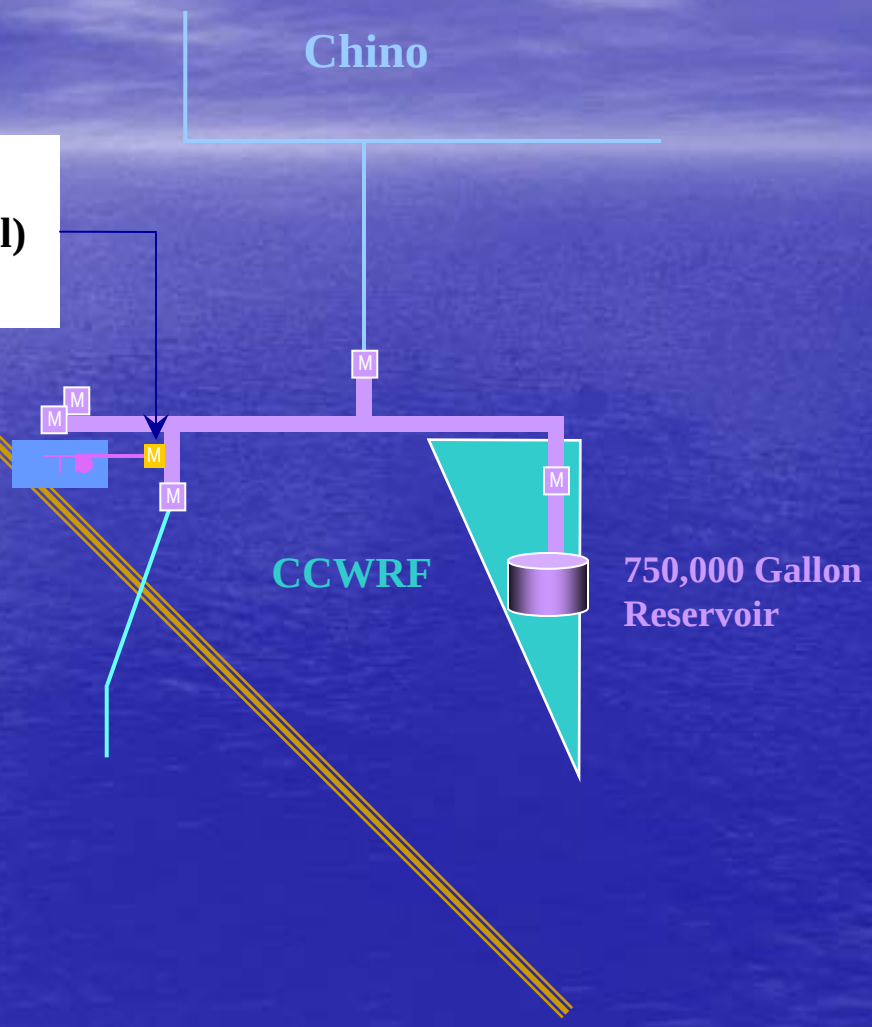
LEGEND

- ***Backbone Line (Existing)***
- ***Lateral (Existing)***
- **Existing Recycled Water Meter**
- **Proposed Recycled Water Meter**
- **Retail Customer- Plumbing Retrofits**
- **Retail Customer- No Plumbing Retrofits**

EXAMPLE OF PROPOSED RECYCLED WATER SERVICE RATE FACTORS

- NEW SERVICE OFF BACKBONE SYSTEM AND ON-SITE WORK

$60.00
+ On Site Retrofit Work (Capital)
+ Administration Costs (City)



LEGEND

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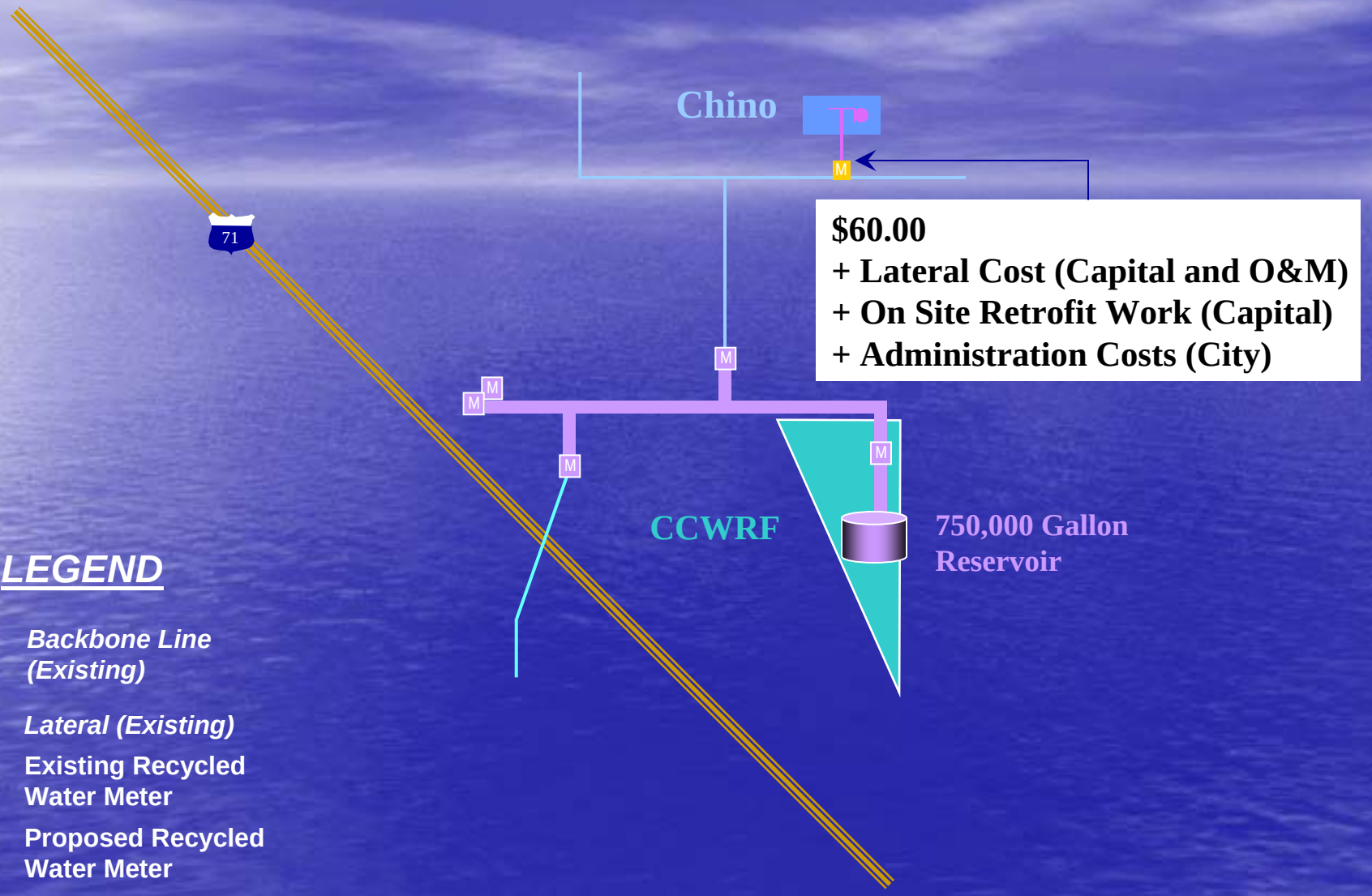
- **Proposed Recycled Water Meter**
- **Retail Customer-Plumbing Retrofits**

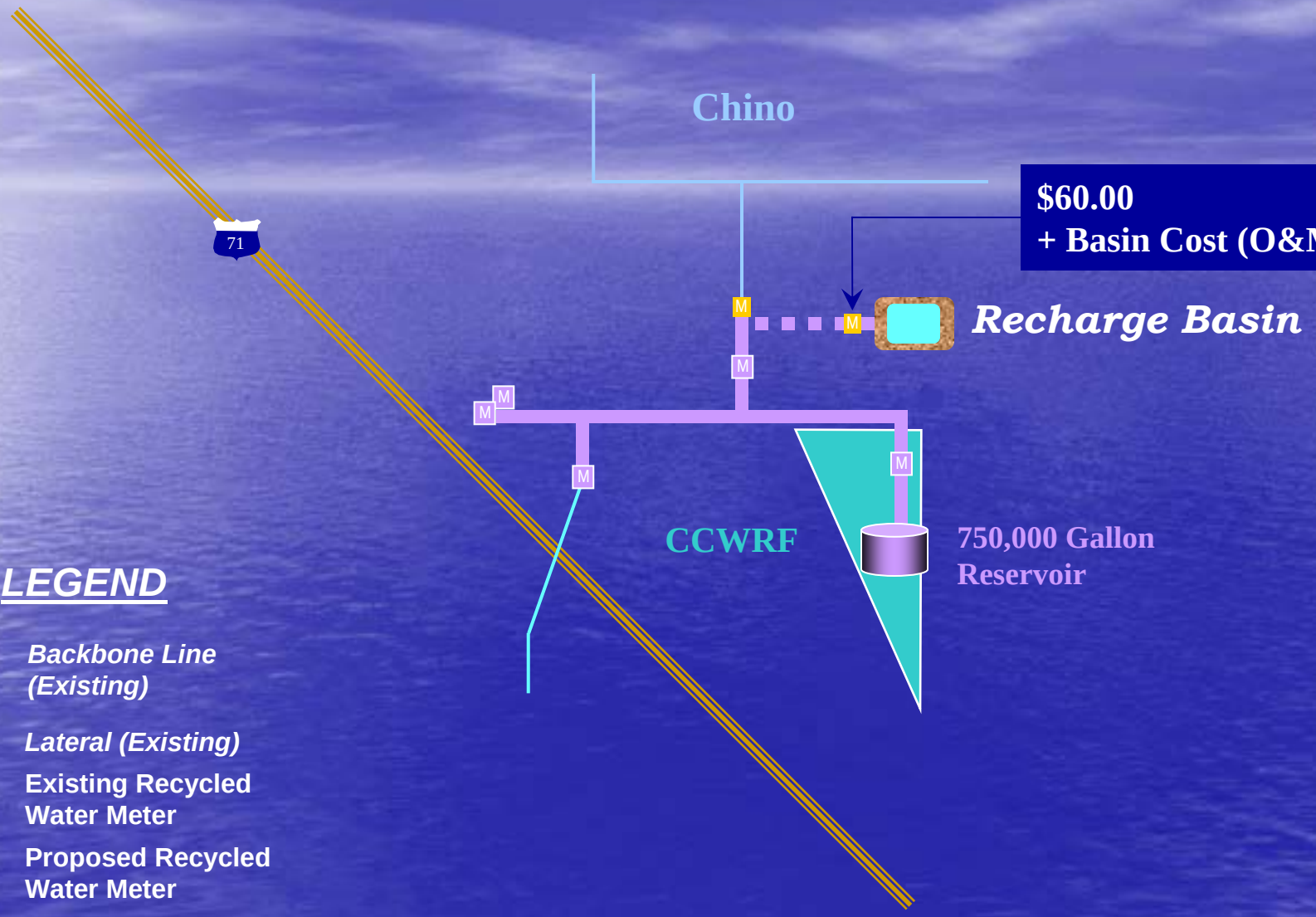
EXAMPLE OF PROPOSED RECYCLED WATER SERVICE RATE FACTORS

- NEW SERVICE OFF A LATERAL AND ON-SITE WORK



EXAMPLE OF PROPOSED RECYCLED WATER SERVICE RATE FACTORS

- FOR AN EXISTING RECHARGE BASIN



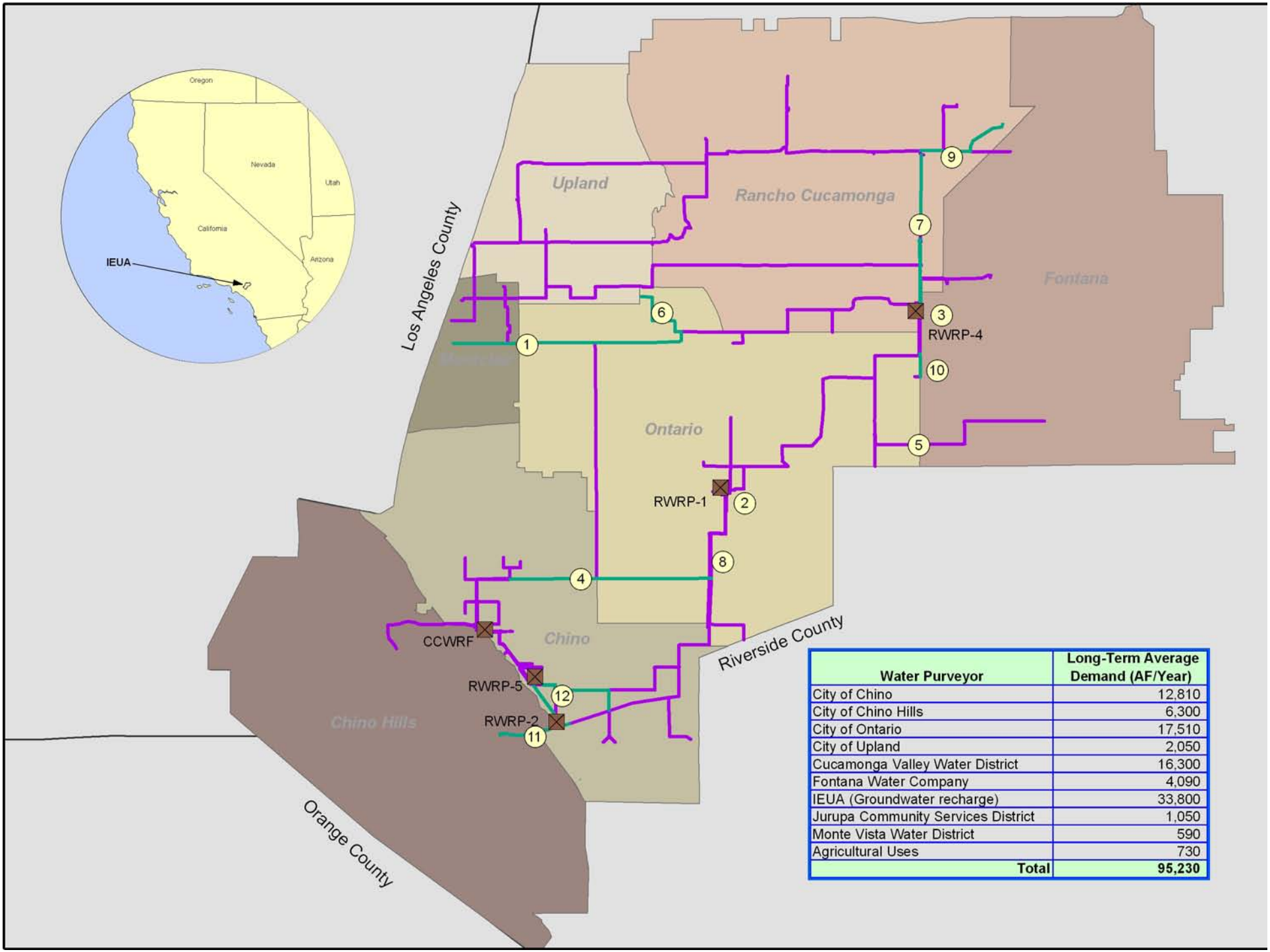
Current Status

- Over 9,300 AFY Demand Connected (167 customers)
- Limited Storage (0.5 MG online as of May ’07) but Growing
- Coordination with Operations, Engineering, Tech Support, Recycled Water Departments, Customers for Reliable Service

Questions and Answers

Regional Facility Design Criteria

- Regional Pressure Zones
  - Match existing potable pressure zones (as practical) in vicinity of regional facilities
  - Service to pressure zones above regional system is retail agency responsibility
- Service on Demand
  - Regional system designed for peak demand
  - 130 MG of regional storage identified in 2005 Implementation Plan (ultimate storage needs can be significantly reduced with demand management and phasing additional storage)



Water Purveyor	Long-Term Average Demand (AF/Year)
City of Chino	12,810
City of Chino Hills	6,300
City of Ontario	17,510
City of Upland	2,050
Cucamonga Valley Water District	16,300
Fontana Water Company	4,090
IEUA (Groundwater recharge)	33,800
Jurupa Community Services District	1,050
Monte Vista Water District	590
Agricultural Uses	730
Total	**95,230**