AGENDA

WORKSHOP
OF THE
BOARD OF DIRECTORS

WEDNESDAY, FEBRUARY 1, 2017
10:00 A.M.

INLAND EMPIRE UTILITIES AGENCY*
AGENCY HEADQUARTERS
6075 KIMBALL AVENUE, BUILDING A
CHINO, CALIFORNIA 91708

CALL TO ORDER
OF THE INLAND EMPIRE UTILITIES AGENCY BOARD OF DIRECTORS
WORKSHOP MEETING

FLAG SALUTE

PUBLIC COMMENT

Members of the public may address the Board on any item that is within the jurisdiction of the Board; however, no action may be taken on any item not appearing on the agenda unless the action is otherwise authorized by Subdivision (b) of Section 54954.2 of the Government Code. Those persons wishing to address the Board on any matter, whether or not it appears on the agenda, are requested to complete and submit to the Board Secretary a "Request to Speak" form which are available on the table in the Board Room. Comments will be limited to five minutes per speaker. Thank you.

ADDITIONS TO THE AGENDA

In accordance with Section 54954.2 of the Government Code (Brown Act), additions to the agenda require two-thirds vote of the legislative body, or, if less than two-thirds of the members are present, a unanimous vote of those members present, that there is a need to take immediate action and that the need for action came to the attention of the local agency subsequent to the agenda being posted.

1. **WORKSHOPS**

   A. REGIONAL WATER RESOURCES MANAGEMENT WORKSHOP

   B. RP-1/RP-5 EXPANSION PDR WORKSHOP NO. 3

Materials related to an item on this agenda submitted to the Agency, after distribution of the agenda packet, are available for public inspection at the Agency's office located at 6075 Kimball Avenue, Chino, California during normal business hours.

2. **ADJOURN**

*A Municipal Water District

In compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please contact the Board Secretary (909) 993-1736, 48 hours prior to the scheduled meeting so that the Agency can make reasonable arrangements.

Proofed by:

Declaration of Posting

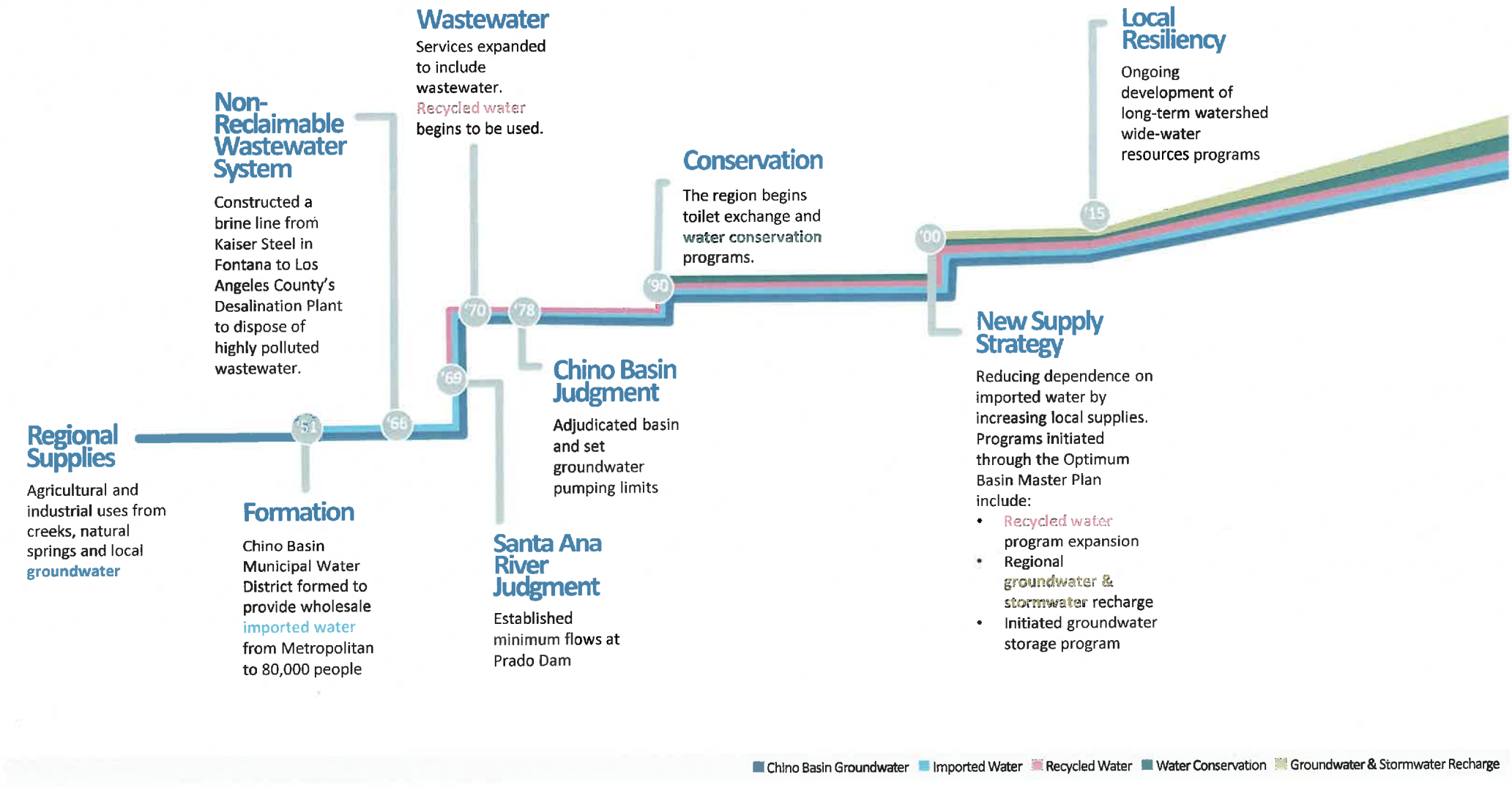
I, April Woodruff, Board Secretary of the Inland Empire Utilities Agency*, A Municipal Water District, hereby certify that a copy of this agenda has been posted by 5:30 p.m. at the Agency's main office, 6075 Kimball Avenue, Building A, Chino, CA on Thursday, January 26, 2017.

April Woodruff

WORKSHOP

1A

IEUA Regional Water Resources Development Timeline



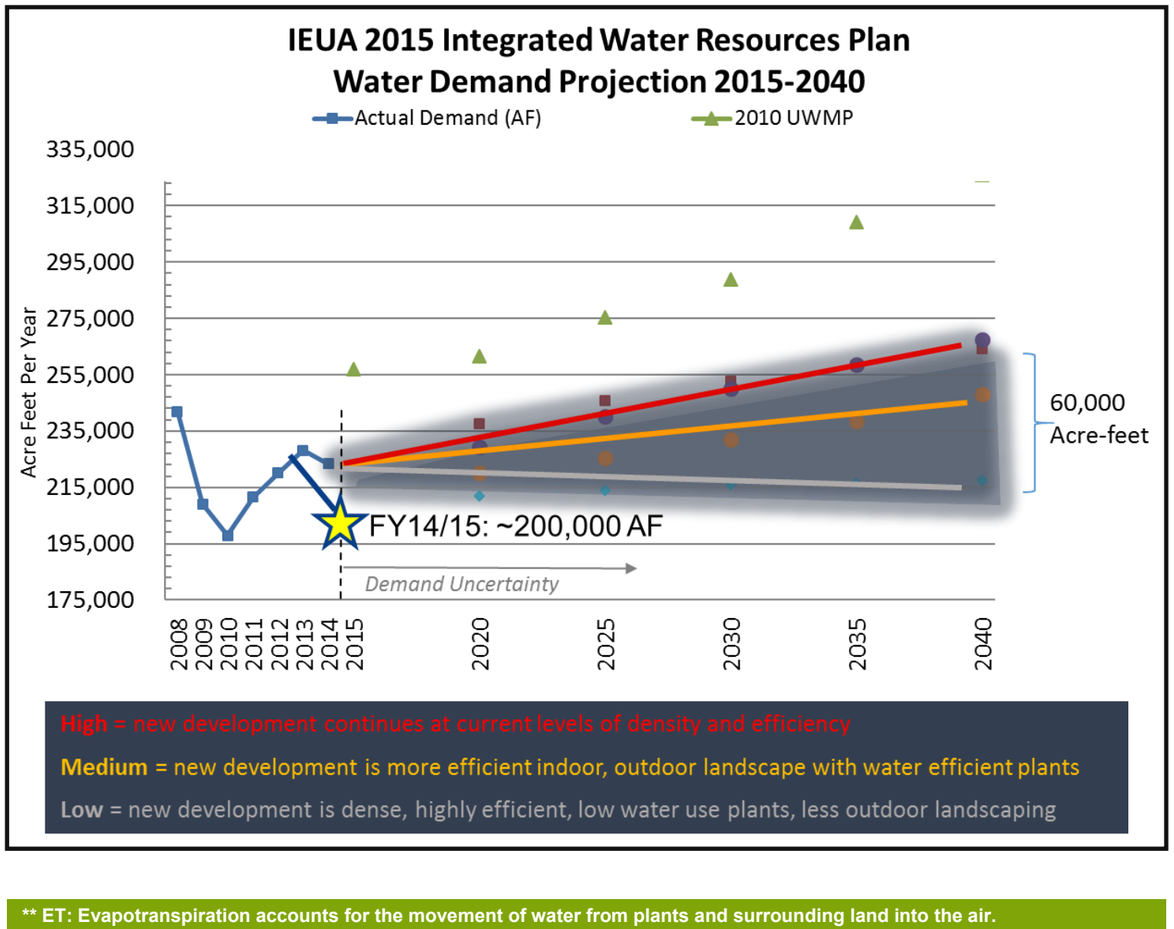
How Much Water Can Be Saved Through Efficiency?

IEUA's 2015 IRP looked at the impact of efficiency standards and new urban development designs on future water needs.

- Assumes service area population growth of 300,000 by 2040 (30%)
- High-end demand assumes development at current levels of density and efficiency and fewer than 1,000 AF of water savings through existing conservation programs
- Low-end demand assumes new development is denser and more efficient (~0.5 ET/35 GPCD** indoor) and efficiency of existing development reaches similar performance levels

Improved indoor and outdoor water efficiency reduces projected 2040 water demands by 20%, about 60,000 AF.

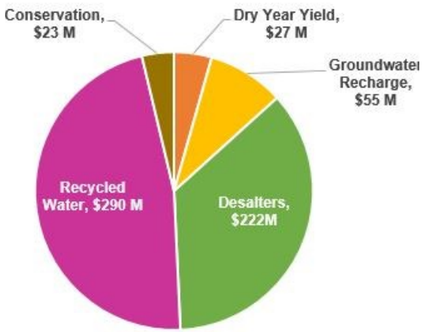
Low water-use California native plants



** ET: Evapotranspiration accounts for the movement of water from plants and surrounding land into the air.
GPCD: gallons per capita per day

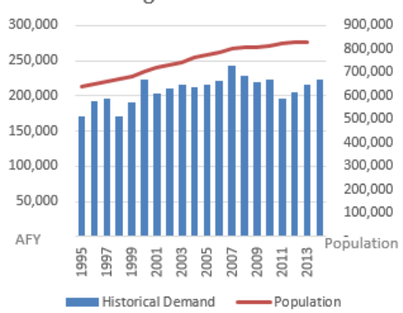
INTEGRATED WATER RESOURCES PLAN

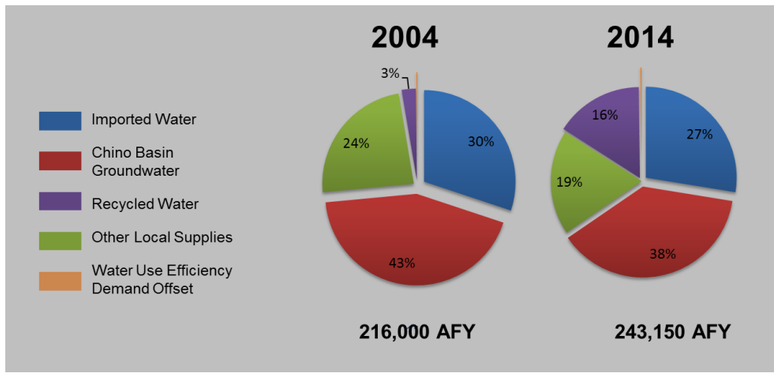
The **Inland Empire Utilities Agency (IEUA)** is committed to investing in our regional water supply for today and tomorrow through fiscal responsibility, efficient business practices, water supply management, and environmental stewardship.



Regional Accomplishments in the Chino Basin since 2000:

- Regional investments of over $617 million in recycled water, groundwater recharge, brackish groundwater desalination, conservation, and dry year yield/conjunctive use programs, with over $258 million funded through grants.
- This funding has enabled the region to develop a resilient water supply, be better prepared for drought conditions and support economic growth without increasing reliance on uncertain imported water sources, including the Bay-Delta.
- Increased local sources of water by over 80,000 acre-feet (AF)*.
- Regional water use efficiency and conservation programs have kept the demands flat as the population has increased.





***AF: An acre-foot can serve the water needs of two average-sized families for one year.**

As we move forward, it is important to continue to manage the water portfolio regionally to provide resilient, efficient and sustainable local water supplies that are cost-effective.

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The IRP will serve as the program document used to complete environmental documents and serve as a basis for grant proposals.

Future Water Supplies

Water supply management challenges include the availability of Bay-Delta water supplies, meeting reasonable use goals and the uncertainties of climate change. The **Integrated Water Resources Plan (IRP)** is a strategic roadmap to meet regional needs for the next quarter of a century. **The goals of the IRP are:**

Resilience: Provide regional water management flexibility to adapt to climate change, economic growth and any changes that limit, reduce or make water supplies unavailable.

Water Efficiency: Meet and exceed rules and regulations for reasonable water use.

Sustainability: Provide environmental benefits, including energy efficiency, reduced greenhouse gas emissions and improved water quality, to meet current needs without compromising the ability of future generations to meet their own needs.

Cost-Effectiveness: Supply regional water in a cost-effective manner and maximize outside funding.

A **major benefit of the IRP** is that it will position the region to secure grants and low-interest loans, including **hundreds of millions** in funding from Proposition 1. IRP projects will complement member agency projects, including water storage, stormwater capture and additional recycled water use.

The **recommended regional strategy** will result in an adaptive IRP that:

1. Recognizes uncertain future risks and opportunities for the region.
2. Identifies conditions that indicate when additional investments are needed.

Next Steps:

- ✓ IRP Phase 1 was completed in December 2015
- ☐ IRP Phase 2 will develop a ***Regional Projects List*** for long term planning and to serve as a grants database
- ☐ IRP Phase 2 will prepare a ***Regional Single-Line Infrastructure Schematic*** for high-level modeling
- ☐ Projects in the IRP are being included in the IEUA Programmatic Environmental Impact Report (PEIR) that is currently underway. The PEIR is expected to be considered for IEUA Board action in Spring 2017.
- ☐ IRP Phase 2 is expected to be completed in 2018

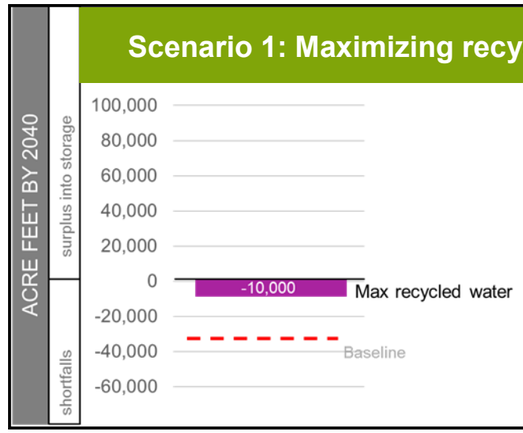
IEUA 2015 Integrated Water Resources Plan Conclusion

Climate Change Scenarios (RAND Assessment Using IPCC Modeling)

IEUA baseline supplies meet 80-90% of demands in 2040

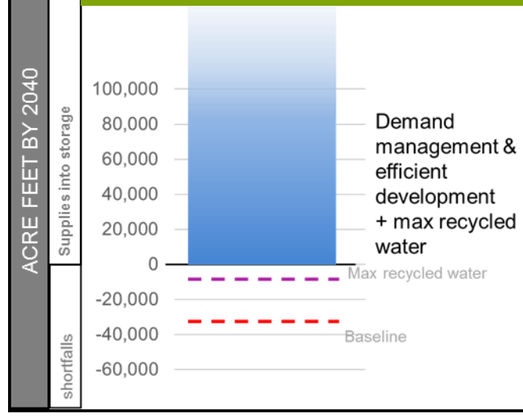
- Assumes service area population growth of 300,000 by 2040 (30%)
- Assumes existing baseline supplies and demands adjusted by climate change (climate impacts reduce some water sources and increase water needs)
- Includes current planned water supply projects through 2025

Scenario 1: Maximizing recycled water meets 96% of demands in 2040



- Maximizes locally available recycled water
- Includes agreements for importing external recycled water supplies (Jurupa, Pomona, etc.)
- Recycled water is IEUA's most climate resilient water supply

Scenario 2: Adding efficiency to Scenario 1 builds supply surplus by 2040



- Assumes new residential development meets State indoor (55 Gallons per Capita per Day, GPCD*) and outdoor (80% Evapotranspiration, ET*) and 4 retail agencies have budget based rate structures using State performance standards
- Surplus water supplies put in Chino Basin groundwater storage for future use
- Adds minimum of 200,000 AF to storage in ALL climate change scenarios
- Enhances regional water resilience and opportunities for exchanges

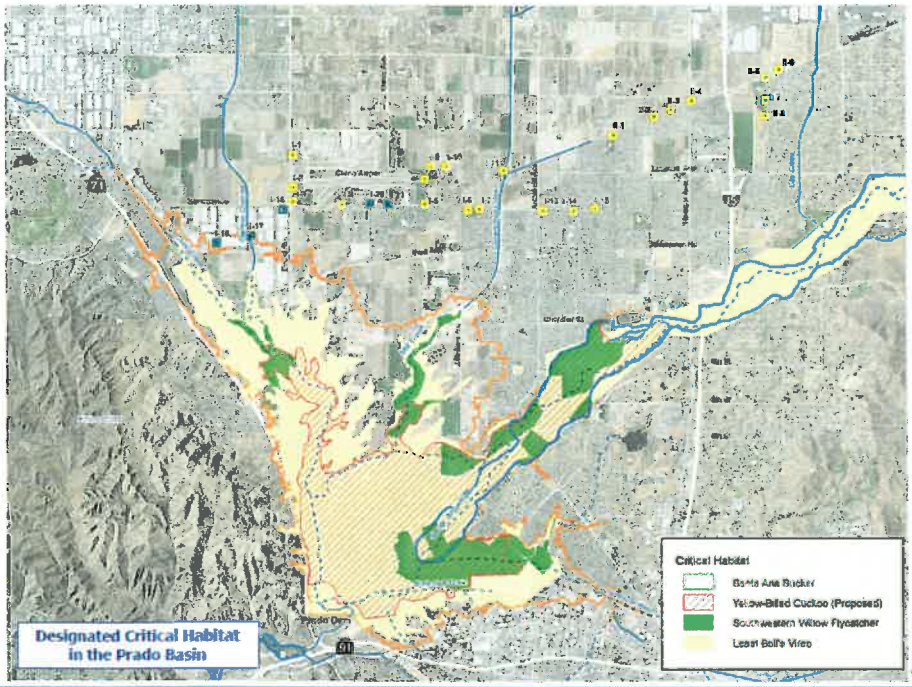
*** ET: Evapotranspiration accounts for the movement of water from plants and surrounding land into the air.**
GPCD: gallons per capita per day

PRADO BASIN ADAPTIVE MANAGEMENT PLAN
FACT SHEET

The Prado Adaptive Management Plan (Prado AMP) is a biological and climate monitoring program for habitat to ensure sustainable water management within the Chino Basin without negative impacts to the environment.

Why do we need the Prado AMP?

- 1990s: **Optimum Basin Management Program (OBMP)** was developed by **Chino Basin Watermaster (CBWM)** to maximize the beneficial use of water supplies in the basin.
- 2000: Chino Basin parties executed the **Peace Agreement**, which brought the parties together to implement the OBMP.
- 2007: Chino Basin parties executed the **Peace II Agreement** to further implement the goals of the OBMP.
- 2010: **Inland Empire Utilities Agency (IEUA)** approved the Peace II Subsequent Environmental Impact Report (SEIR) as a **California Environmental Quality Act (CEQA)** requirement to implement the OBMP projects.
- **Peace II SEIR** was collaboratively completed by IEUA and CBWM and laid the foundation for the implementation of hydraulic control, the construction of the Desalters and the continued use of recycled water.
- The SEIR required IEUA, CBWM, Orange County Water District and other stakeholders to convene and develop the **Prado AMP** to create a monitoring program to ensure habitat will not incur negative impacts with potential groundwater level drawdown with the implementation of the **Peace II Agreement**.



The Prado AMP is jointly funded by IEUA and CBWM, with the exception of groundwater and surface water monitoring which is 100% funded by CBWM.

The Prado AMP is a CEQA requirement for Peace II SEIR. It includes a biological monitoring program for habitat, identification of stressors and water management options that would minimize impact and provide long term ecological sustainability.

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CHINO BASIN WATERMASTER

The Prado AMP Includes:

- *Construction of monitoring wells*
- *Groundwater & surface water monitoring*
- *Vegetation survey*
- *Photo monitoring of the habitat*
- *Annual report*

Initial Program Cost:
$770,000

Ongoing Annual Costs:
$150,000 - $400,000

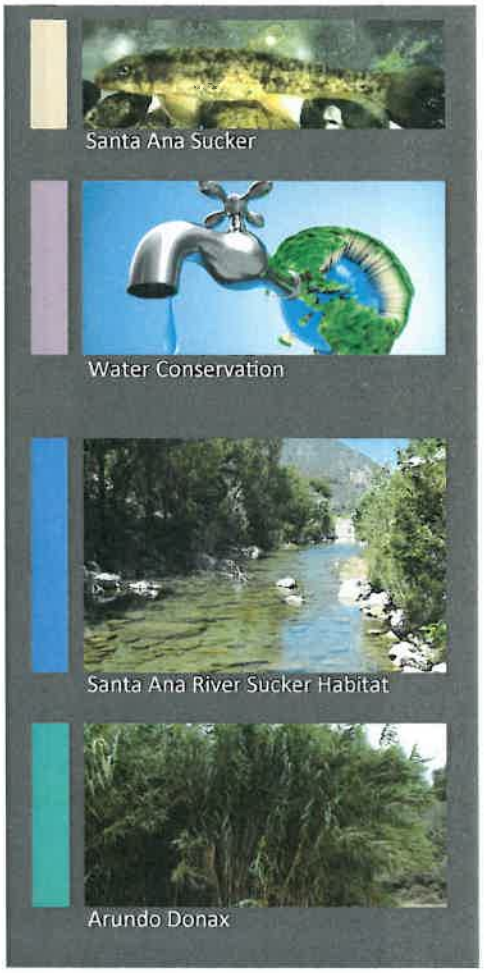
Vegetation Survey/ Photo Monitoring (Willows)

Groundwater Monitoring Program

The Prado AMP was developed in June 2016.

SANTA ANA RIVER CONSERVATION & CONJUNCTIVE USE PROGRAM (SARCCUP) FACT SHEET

Santa Ana River Conservation and Conjunctive Use Program (SARCCUP) is the result of collaboration between the five Santa Ana Watershed Project Authority (SAWPA) member agencies (Agencies) to identify large-scale water supply reliability and water use efficiency projects that could benefit the Santa Ana River Watershed. The collaborating Agencies are Eastern Municipal Water District (EMWD), Inland Empire Utilities Agency (IEUA), Orange County Water District (OCWD), San Bernardino Valley Municipal Water District (SBVMWD), and Western Municipal Water District (WMWD). The program is intended to take advantage of the time periods when extraordinary water supply is available and can be stored locally.



SARCCUP's goal is to establish a program that includes:

- **Groundwater Banking program of 180 Thousand Acre-Feet (TAF)** will include storage in Chino Basin (96 TAF), San Jacinto Basin (19.5 TAF), Elsinore Basin (4.5 TAF), and San Bernardino Basin (60 TAF); also includes construction and integration of new recharge, wells, pipelines, and creation of a groundwater bank.
- **Habitat Improvement** will create 3.5 miles of stream habitat for the Santa Ana Sucker, restore 41 acres of habitat, remove 640 acres of Arundo Donax (non-native plant that uses large amounts of water), and provide **2.4 TAF annual water savings.**
- **Water Use Efficiency** will provide **7.2 TAF annual water savings** by implementing a regional program to support implementation of budget based rates for five retail agencies, and provide landscape transformation.

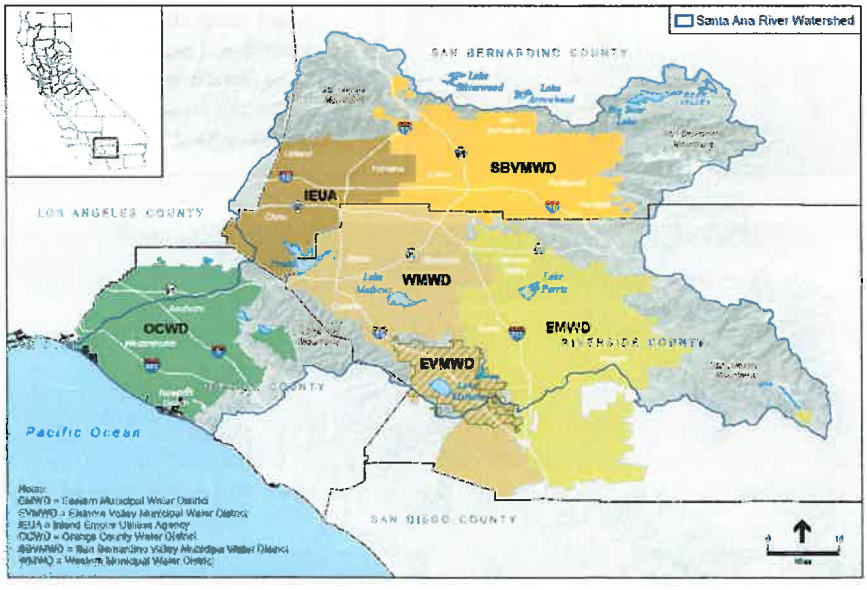


Figure 1
Regional Location Map

SARCCUP BENEFITS FOR CHINO BASIN

- Water Quality Improvements
- Water Level Increases
- Land Subsidence Mitigation
- Leverage Grant Funds
- New Water Supply
- Blending Water for Groundwater Recharge
- System Interconnection
- Peak Recycled Water Demand Management

TAF: Thousand Acre-Feet; 1 AF will provide water supply for two families for a year.

emwd EASTERN MUNICIPAL WATER DISTRICT
Inland Empire Utilities Agency A MUNICIPAL WATER DISTRICT
SINCE 1933
Valley SAN BERNARDINO MUNICIPAL WATER DISTRICT
WESTERN MUNICIPAL WATER DISTRICT

Chino Basin SARCCUP Facilities

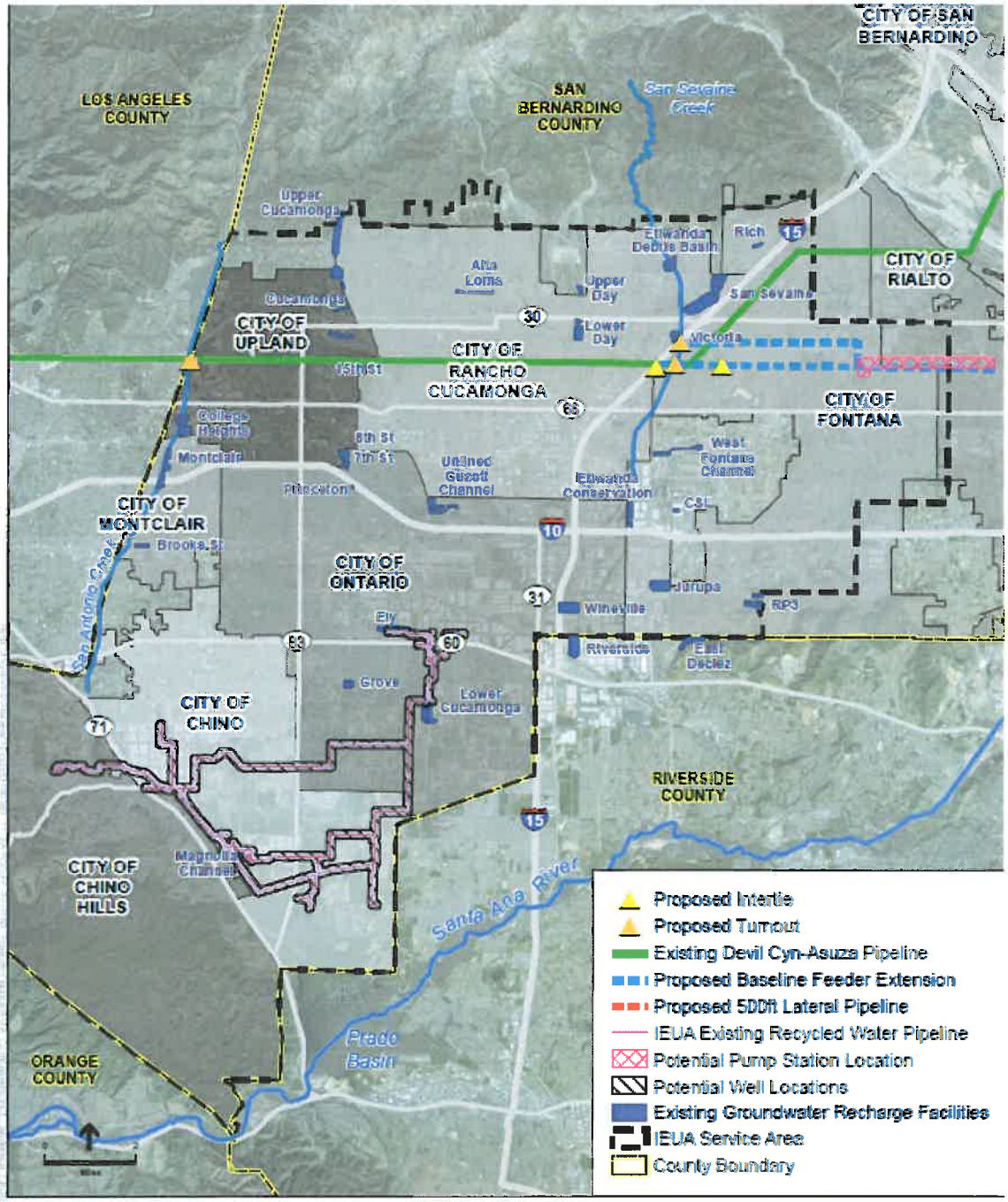
Features

96 TAF Storage Capacity

32 TAF per year dry year production and exchanges

Construction of:

- 48-in. Baseline Pipeline
- Turnout facilities at San Sevaine Creek
- Devil Canyon-Azusa Pipeline dual use turnout near San Antonio Creek
- Extraction wells – into South Pressure Zone of recycled water system (for OCWD take)



Highlights and Next Steps

✓Department of Water Resources awarded $55M Proposition 84 grant for the SARCCUP. Total cost for the SARCCUP is $100M.

✓The public comment period for the SARCCUP Programmatic Environmental Report closed on January 12, 2017.

☐SARCCUP Agencies working with SAWPA to develop sub-agency agreements for the local share of $9M per each of the five Agencies

☐SARCCUP Decision Support Modeling is underway to simulate anticipated operations of the proposed SARCCUP facilities, identify constraints and facilities, and optimize operation and quantify the benefits and costs. The model is expected to be completed by March 2017.

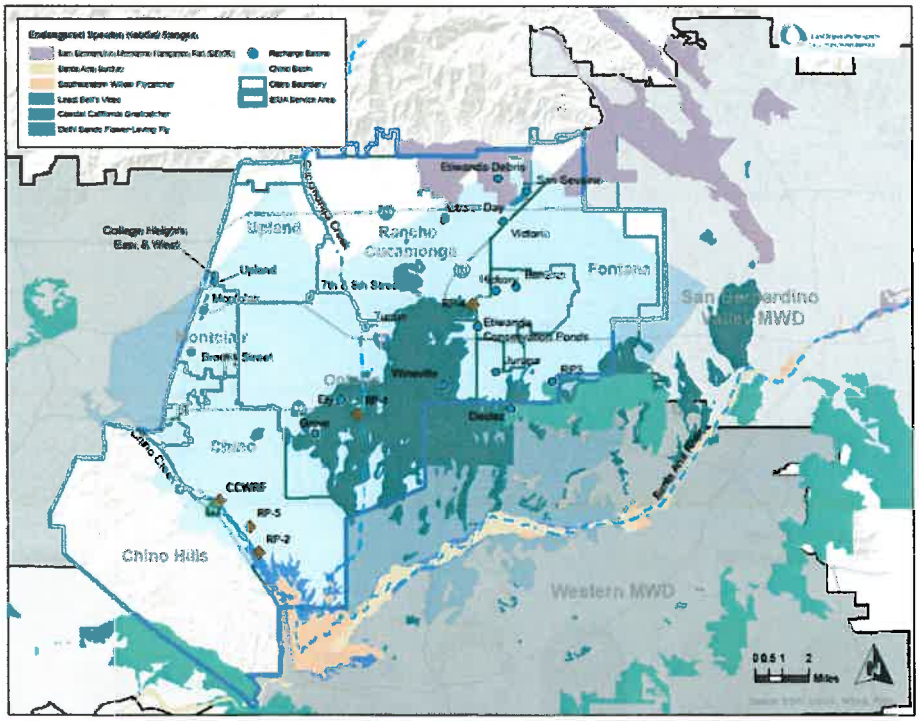
☐Feasibility analysis and inter-agency agreements are expected to be completed by July 2018, with a final project completion date of July 2021.

UPPER SANTA ANA RIVER HABITAT CONSERVATION PLAN FACT SHEET

The Upper Santa Ana River Habitat Conservation Plan (Upper SAR HCP) will specify how species and their habitats will be protected and managed in the future. It will also provide incidental take permits needed by the water resource agencies under the Federal and State endangered species acts to be able to maintain, operate and improve their water resource infrastructure.

Inland Empire Utilities Agency & Chino Basin Watermaster:

- Jointly fund the Chino Basin portion of the study.
- Will implement the groundwater recharge basin improvements and expansion projects in discussion since the early 2000s.
- Enable basin improvements per the 2013 Recharge Master Plan Update, and pre-negotiate environmental permits for impacted construction areas.
- Streamline the process of obtaining permits through a regional planning effort along with the regulatory agencies to obtain long-term permits for both the construction and operation of the recharge basins.



The study is anticipated to be completed by 2018.

The Upper SAR HCP is a collaborative effort among the water resource agencies of the Santa Ana River Watershed, in partnership with the US Fish and Wildlife Service, California Department of Fish and Wildlife, and several other government agencies and stakeholder organizations.

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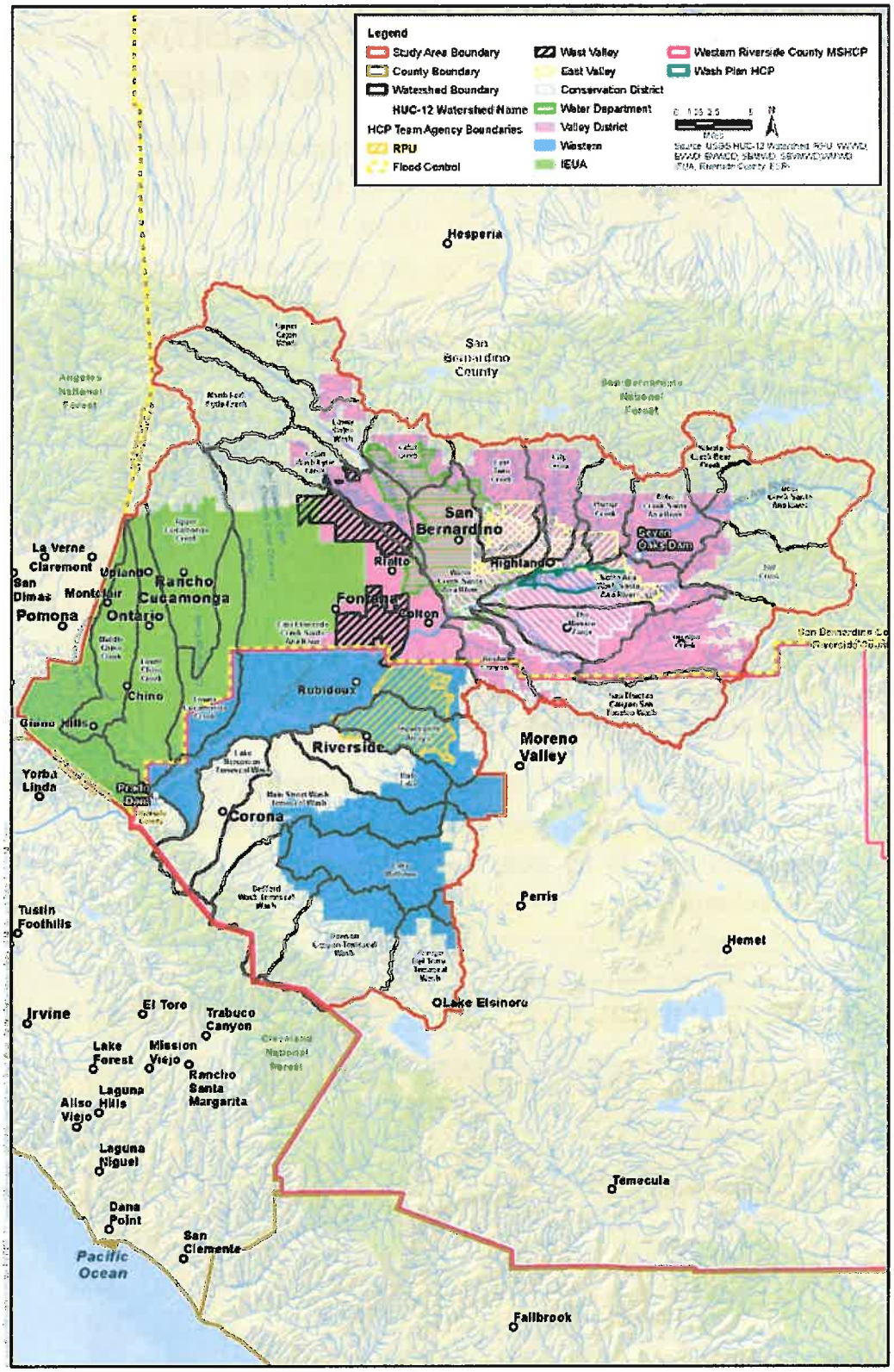
Chino Basin Watermaster
Partners in Basin Management

BENEFITS OF REGIONAL COORDINATION

- ✓ Efficient
- ✓ Cost-effective
- ✓ Greater biological success
- ✓ Mitigation banks
- ✓ Long term permits
- ✓ Habitat owned by HCP partners
- ✓ Overall habitat enhancement opportunities



ICF Upper Santa Ana River Habitat Conservation Plan

Study Area

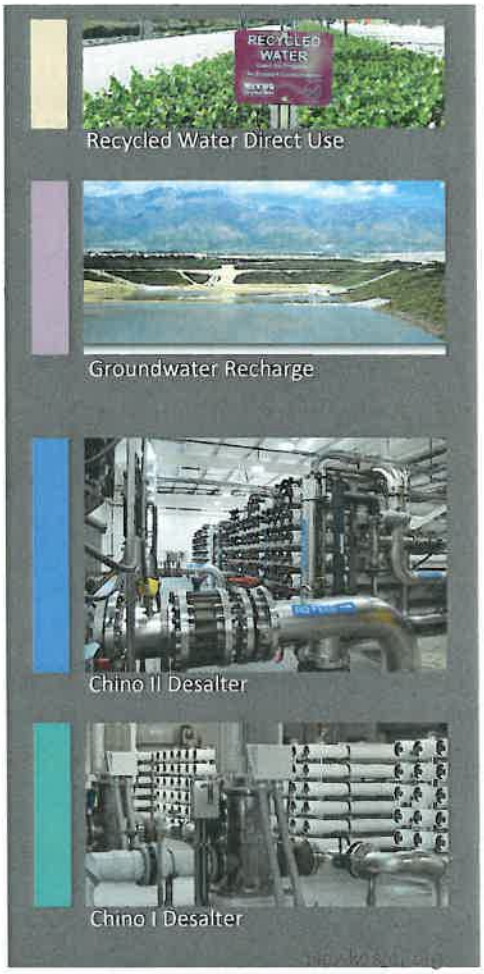
OPTIMUM BASIN MANAGEMENT PROGRAM
FACT SHEET

The **Optimum Basin Management Program (OBMP)** in the Chino Basin was intended to develop a groundwater management program that enhances safe yield and water quality of the basin, enabling all groundwater users to produce water from the basin in a cost-effective manner. The OBMP consists of **four primary goals**:

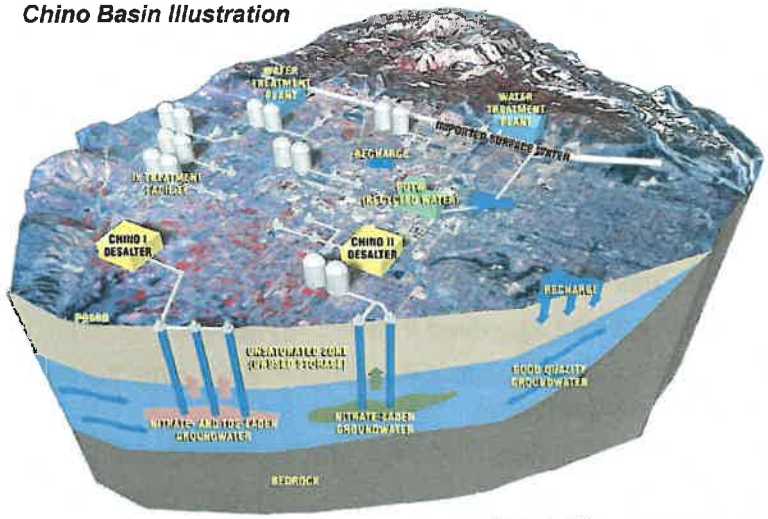
1. Enhance basin water supplies
2. Protect and enhance water quality
3. Enhance management of the basin
4. Equitably finance the OBMP

The **nine Program Elements** that needed to be implemented to achieve the goals of the OBMP are:

1. Comprehensive Monitoring Program
2. Comprehensive Recharge Program
3. Water Supply Plan for the Impaired Areas of the Basin
4. Groundwater Management Plan for Management Zone 1
5. Regional Supplemental Water Program
6. Cooperative Programs with the Regional Water Quality Control Board (RWQCB) to Improve Basin Management
7. Salt Management Program
8. Groundwater Storage Management Program
9. Storage and Recovery Programs



Chino Basin Illustration



Courtesy of Chino Basin Watermaster

The OBMP is the basis for the success of the water resource programs within the Chino Basin. It led to the achievement of hydraulic control within the Chino Basin by controlling discharge from the Chino Basin to the Santa Ana River resulting in improved water quality by the strategic operation of the Chino Desalter wellfields.

Hydraulic control was achieved in February 2016 as a result of OBMP Implementation.

Inland Empire Utilities Agency
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CHINO BASIN WATERMASTER

OBMP led to the following local supply development:

Chino Basin Desalters
(new water supply)
40 TAF ($222M)

Groundwater Storage
100 TAF ($27M)

Groundwater Recharge
110 TAF ($55M)

Recycled Water
50 TAF ($290M)

Water Use Efficiency
80 TAF* ($23M)

Total Program Cost ~$617 M

Grants of ~$258M

*Lifetime water savings

SANTA ANA REGION BASIN PLAN

The RWQCB adopts **Basin Plans** specific for each watershed, thereby establishing water quality objectives, and serves as the basis for regulatory programs. In order to continue developing programs as identified in the OBMP such as the Desalter, groundwater recharge, and recycled water, **Inland Empire Utilities Agency (IEUA) and Chino Basin Watermaster (CBWM)** had to demonstrate that the maximum beneficial use of the water of the State was being achieved. The **Basin Plan** contains nine commitments that must be met in the Chino Basin:

1. Implement a surface water monitoring program.
2. Implement groundwater monitoring programs.
3. Expansion of Chino I Desalter (10 million gallons per day (MGD)) & construction of Chino II Desalter (10 MGD).
4. Commitment to future desalters per OBMP and Peace Agreement.
5. Complete the recharge facilities included in Chino Basin Facilities Improvement Program.
6. IEUA Wastewater quality plan improvement plan and schedule submittal.
7. Management of salt & nitrogen in artificial recharge to be less than or equal to maximum benefit objectives.
8. Achievement and maintenance of hydraulic control.
9. Determination of the ambient salt and nitrogen concentrations in the Chino Basin every three years.

Milestones in the Chino Basin

2000 – Chino Basin Parties executed **OBMP** & Peace I Agreement

2000 – IEUA Certified Programmatic Environmental Impact Report PEIR for **OBMP**

2000 – Desalter I, Phase I Startup

2002 – CBWM Adopted Recharge Master Plan

2002 – IEUA Certified PEIR for Recycled Water Master Plan

2004 – **Basin Plan and Maximum Benefit Amendment** by RWQCB

2006 – Desalter I Expansion and Desalter II Startup

2007 – IEUA/CBWM Approved Peace II Agreement

2010 – IEUA Certified Peace II Subsequent Environmental Impact Report for Desalter Expansion

2010 – CBWM completed Recharge Master Plan Update,

2013 – Initiation of Upper Santa Ana River Habitat Conservation Plan **(Upper SAR HCP)**

2016 – Desalter Phase III Startup, Prado Adaptive Management Plan **(Prado AMP), Hydraulic Control achieved**

Regional Water Resources Management

IEUA Board Workshop

February 1, 2017

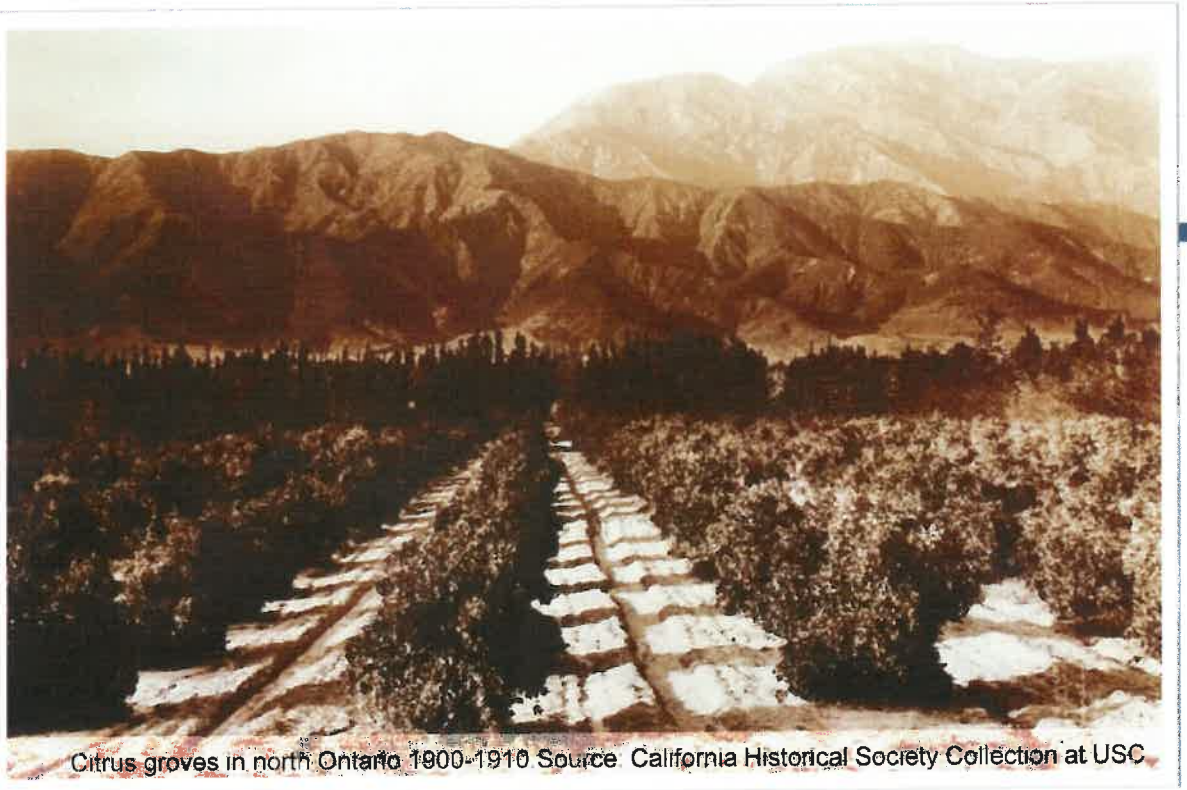
Overview

- Background of IEUA's Water Resources Development
- Current Watershed-Wide Water Resources Programs:
  - Prado Adaptive Management Plan
  - Santa Ana River Habitat Conservation Plan
  - Water Bank
  - Santa Ana River Conservation and Conjunctive Use Project

Background

Regional Supplies

Agricultural and industrial uses from creeks, natural springs and local **groundwater**



Citrus groves in north Ontario 1900-1910 Source: California Historical Society Collection at USC

Chino Basin Groundwater | Imported Water | Recycled Water | Water Conservation | Groundwater & Stormwater Recharge

Background

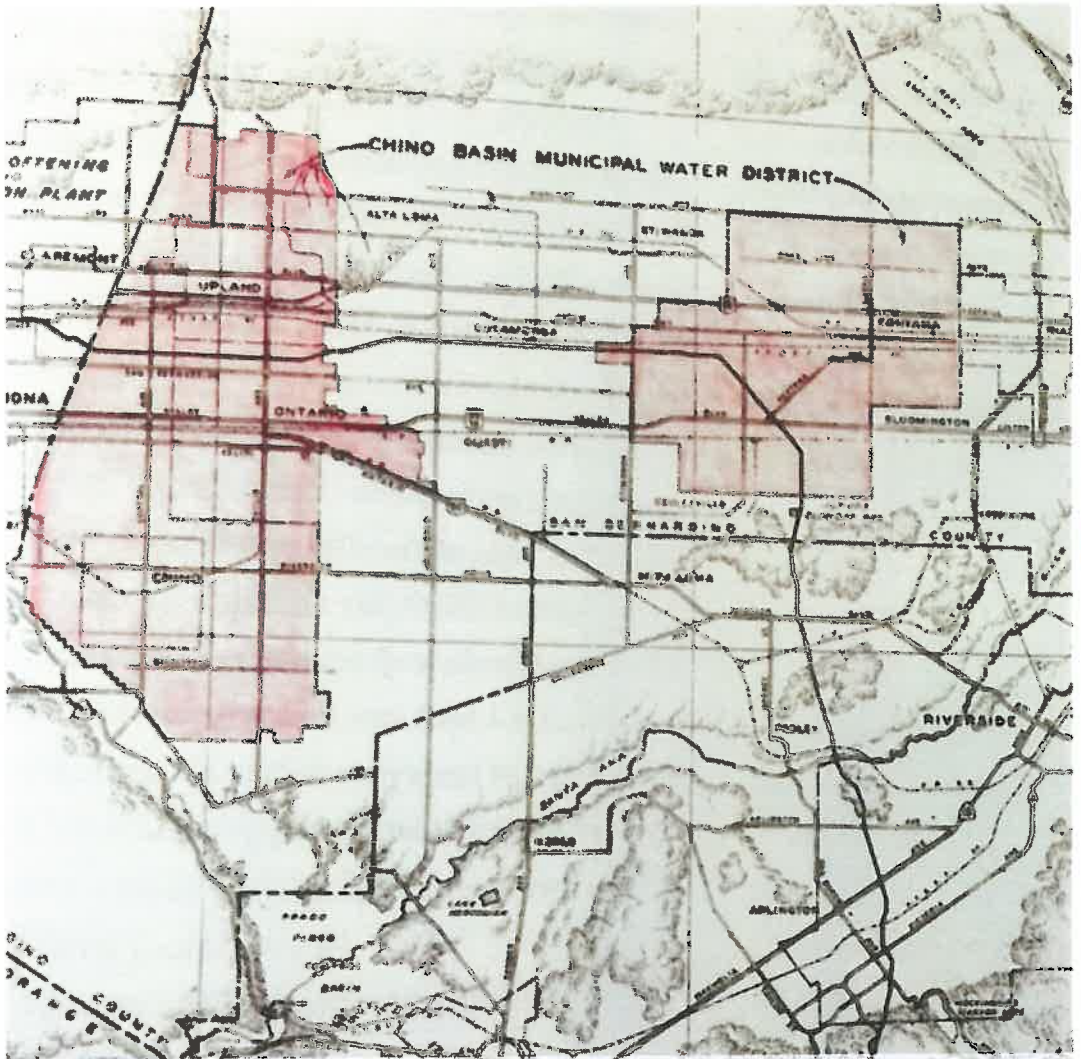
Pipeline inspection 1950

Regional Supplies

'50

Formation

Chino Basin Municipal Water District formed to provide wholesale imported water from Metropolitan to 80,000 people



Map of service area, 1951. Source: Metropolitan Water District of Southern California

■ Chino Basin Groundwater ■ Imported Water ■ Recycled Water ■ Water Conservation ■ Groundwater & Stormwater Recharge

Background

Regional Supplies

'50

Formation

'69

'70

Wastewater
Services expanded to include wastewater. **Recycled water** begins to be used.

Santa Ana River Judgment
Established minimum flows at Prado Dam

RP 1 in the 1970

■ Chino Basin Groundwater ■ Imported Water ■ Recycled Water ■ Water Conservation ■ Groundwater & Stormwater Recharge

Background

Regional Supplies

'50

Formation

'69

Santa Ana River Judgment

'70

Wastewater
Recycled water

Chino Basin Judgment
Adjudicated basin and set pumping limits

'78

'90

Water Use Efficiency
The region begins toilet exchange programs.

Chino Basin Groundwater | Imported Water | Recycled Water | Water Conservation | Groundwater & Stormwater Recharge

Background

Water Use Efficiency

'78

'90

'00

'70

Chino Basin Judgment

Regional Supplies

'50

'69

Formation

Wastewater
Recycled water

Santa Ana River Judgment

New Supply Strategy

Reducing dependence on imported water by increasing local supplies. Programs initiated through the Optimum Basin Master Plan include:

- **Recycled water** program expansion
- Regional **groundwater & stormwater** recharge
- Initiated groundwater storage program
- Chino Basin Desalters

■ Chino Basin Groundwater ■ Imported Water ■ Recycled Water ■ Water Conservation ■ Groundwater & Stormwater Recharge

Background

Regional Supplies

'51 Formation

'69 Santa Ana River Judgment

'70 Wastewater
Recycled water

'78 Chino Basin Judgment

'90 Water Use Efficinecy

'00 New Supply Strategy
Optimum Basin Master Plan
- Recycled water
- Groundwater recharge
- Groundwater storage
- Chino Basin Desalters

'15 **Local Resiliency**
Ongoing development of long-term watershed wide-water resources programs

Chino Basin Groundwater | Imported Water | Recycled Water | Water Conservation | Groundwater & Stormwater Recharge

Chino Basin Water Resources

1951 → 2016

Population of 80,000

Regional Water Portfolio:

- Chino Basin Groundwater
- Creek Water
- MWD Imported Water

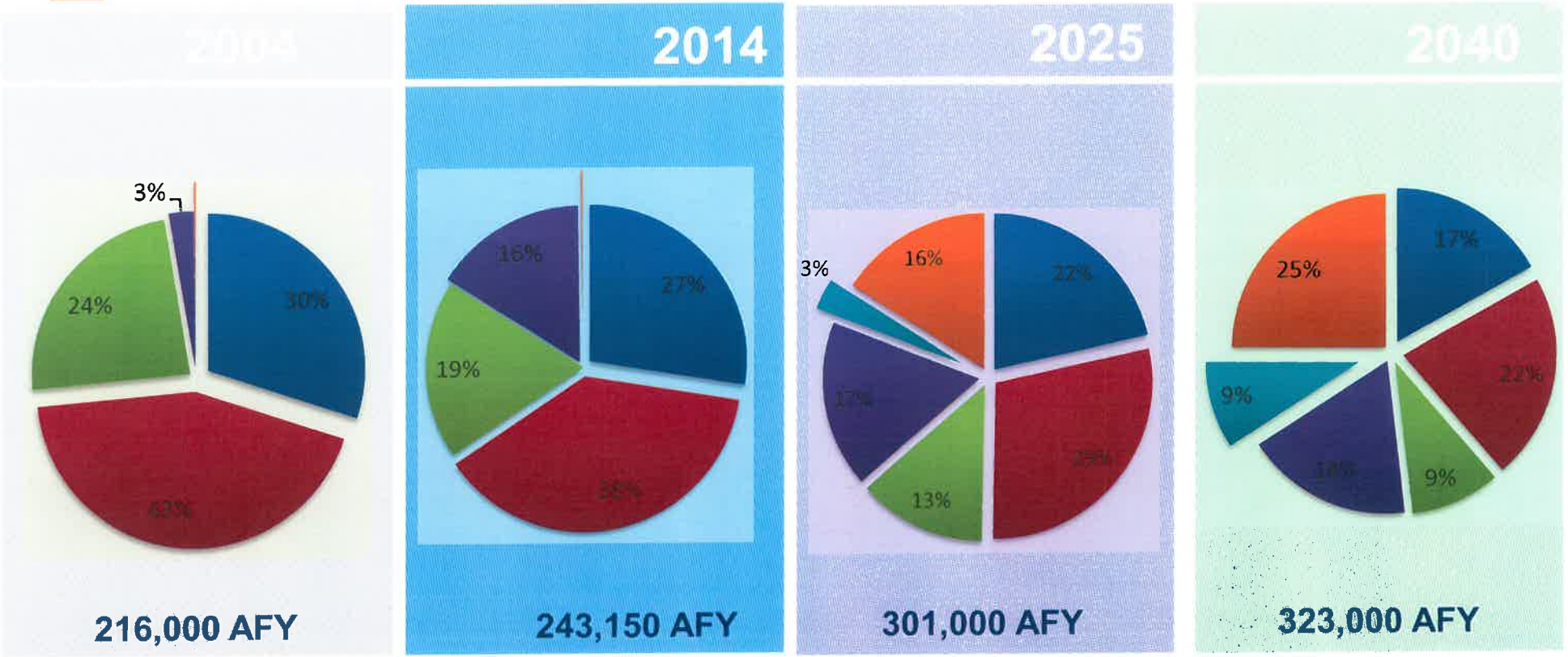
Population of 875,000

Regional Water Portfolio:

- Chino Basin Groundwater
- Creek Water
- MWD Imported Water
- Recycled Water
- Chino Desalter
- Conservation
- Groundwater & Stormwater Recharge

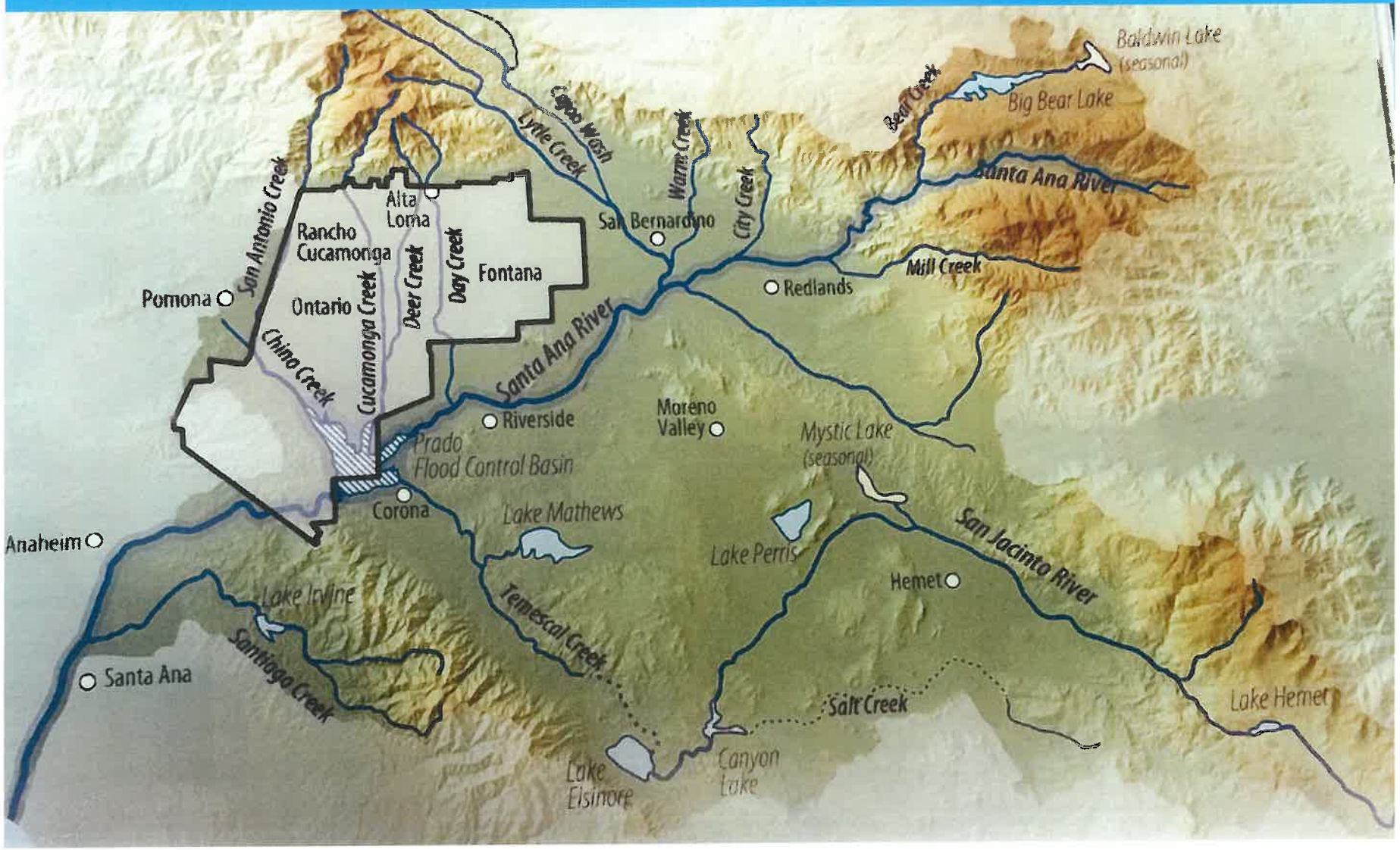
IEUA Water Portfolio Over Time

- Imported Water
- Chino Basin Groundwater
- Recycled Water
- Other Local Supplies
- Conjunctive Use Availability
- Water Use Efficiency Demand Offset

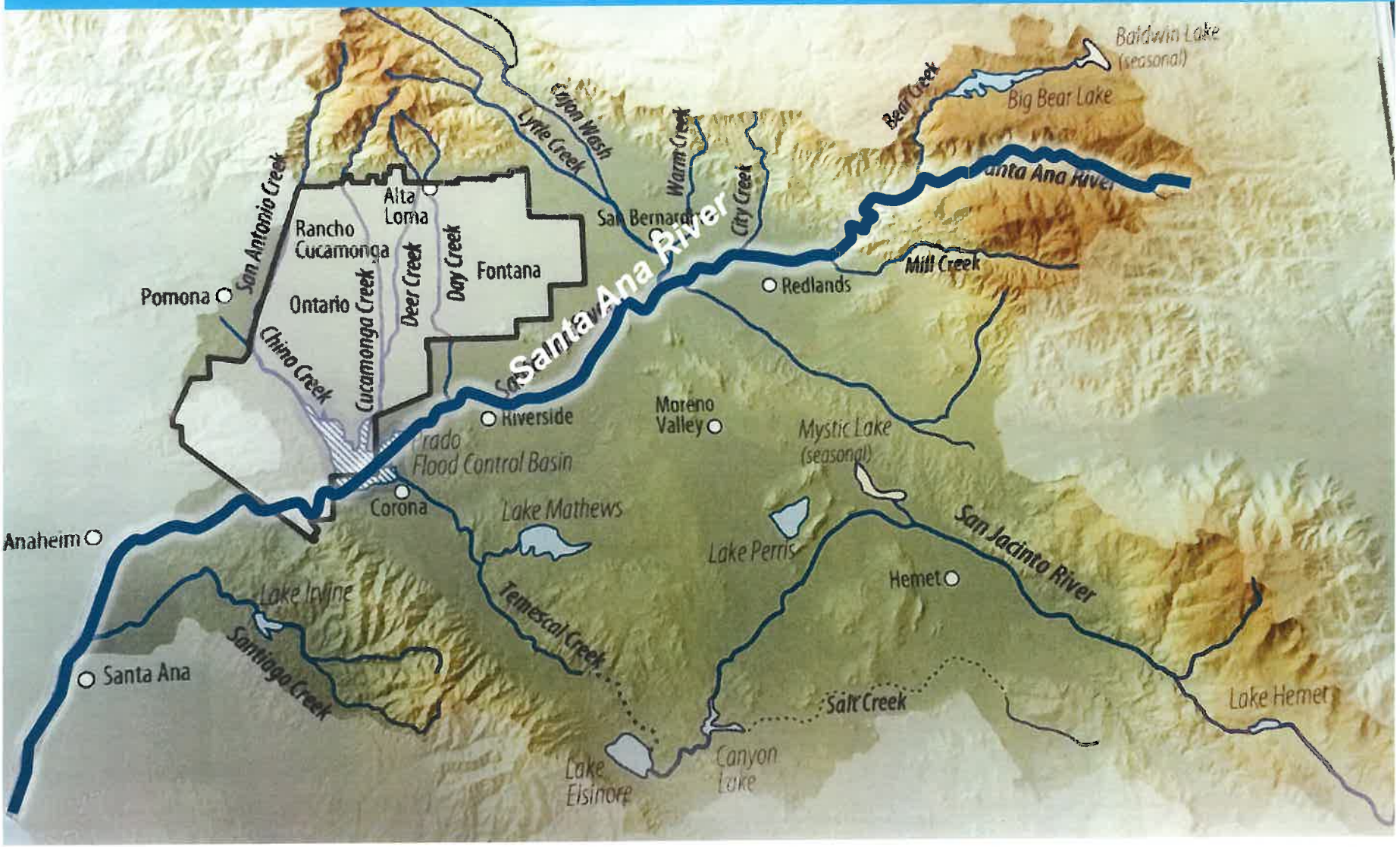


Current Watershed-Wide Water Resources Programs

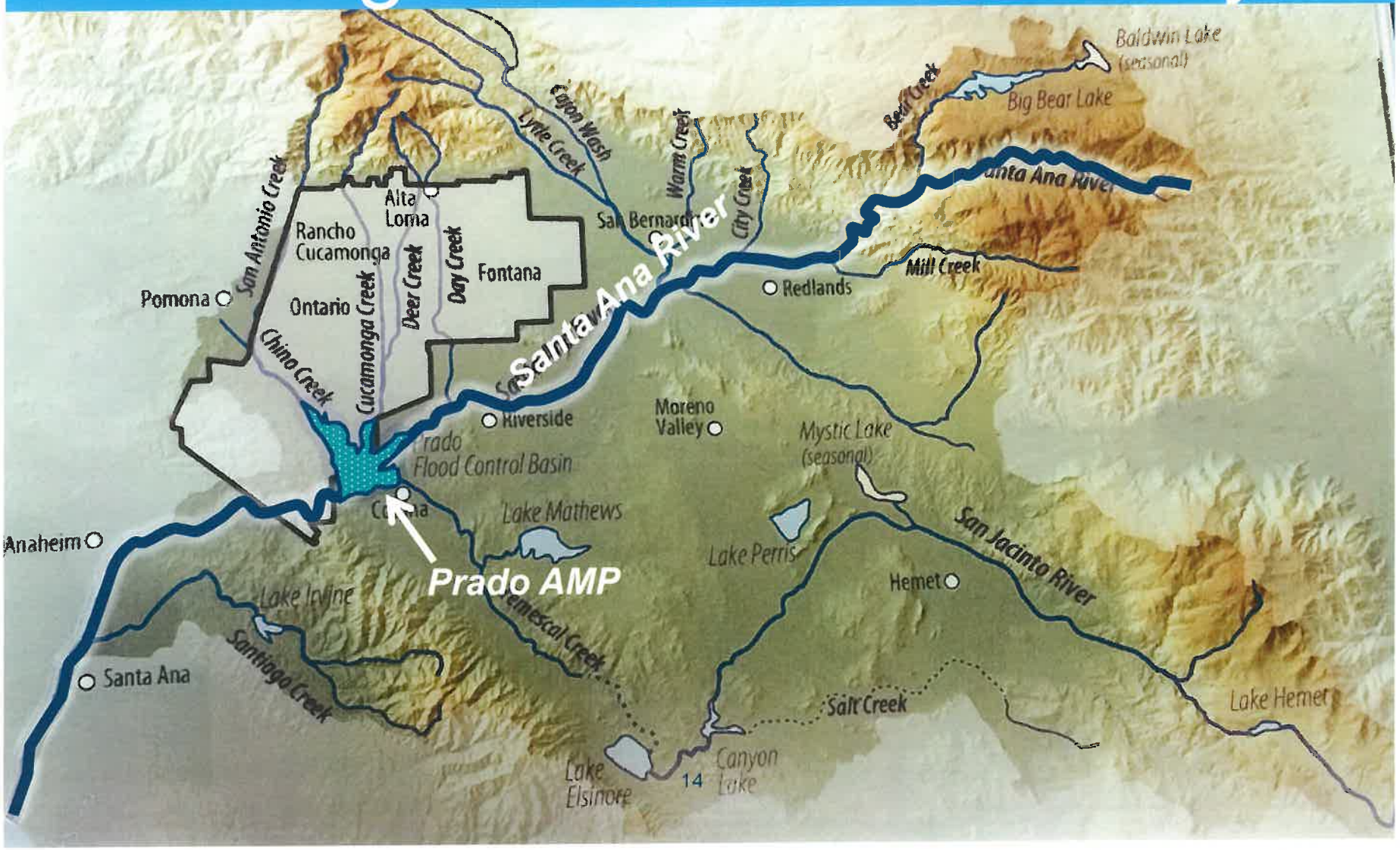
Regional Context Maps



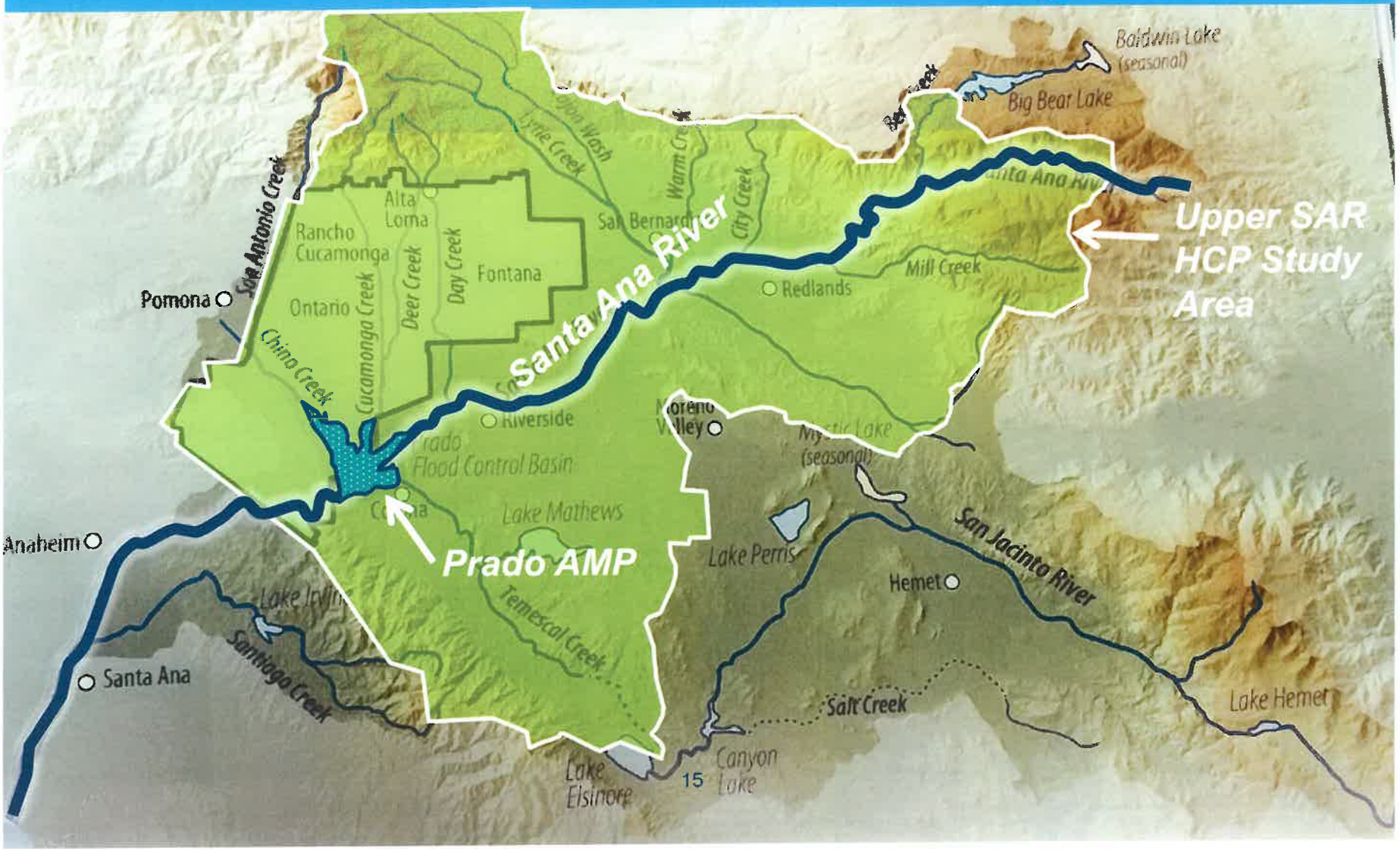
Santa Ana River



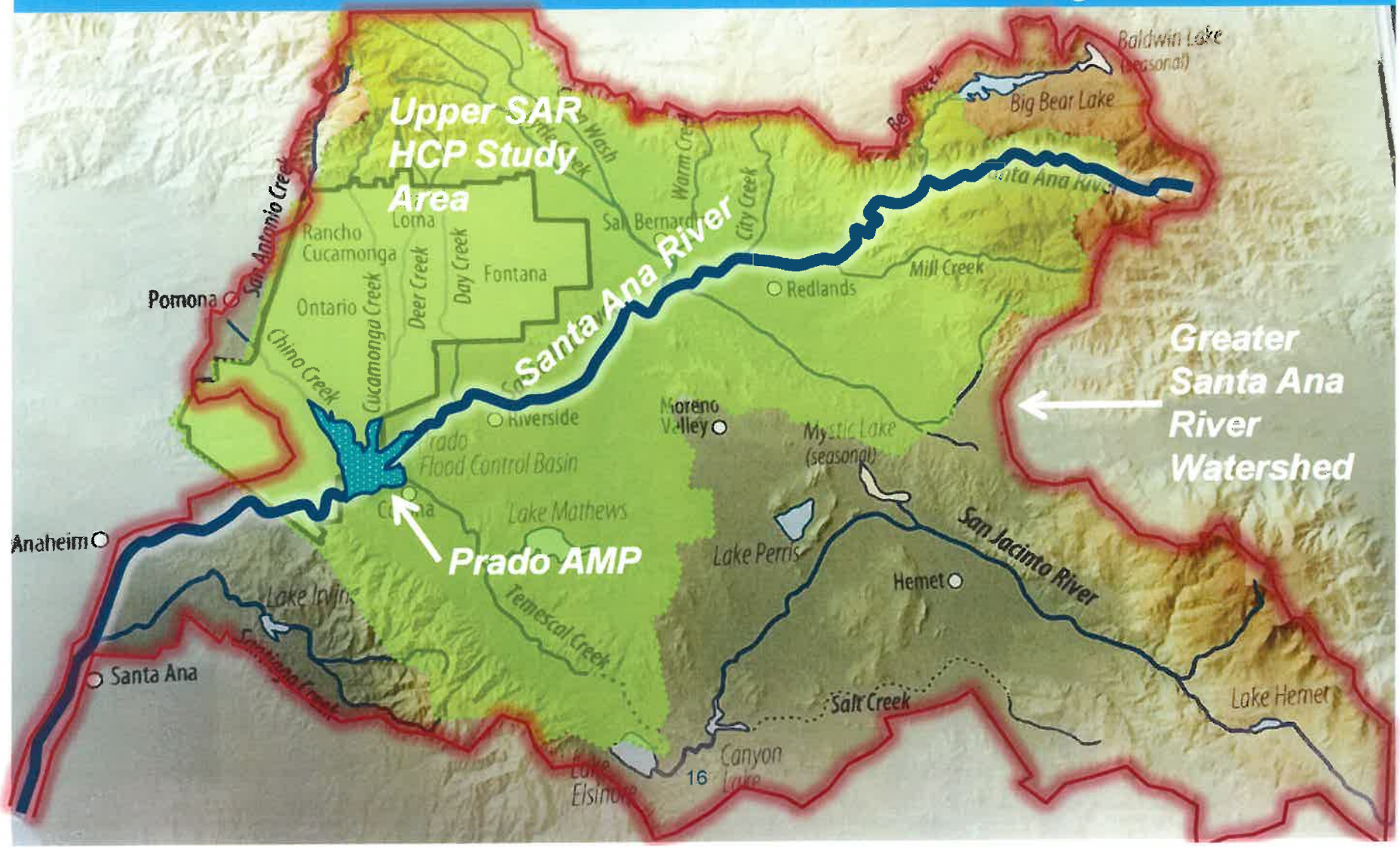
Prado Basin Adaptive Management Plan Boundary



Upper Santa Ana River Habitat Conservation Plan Study Area



Greater Santa Ana River Watershed Boundary



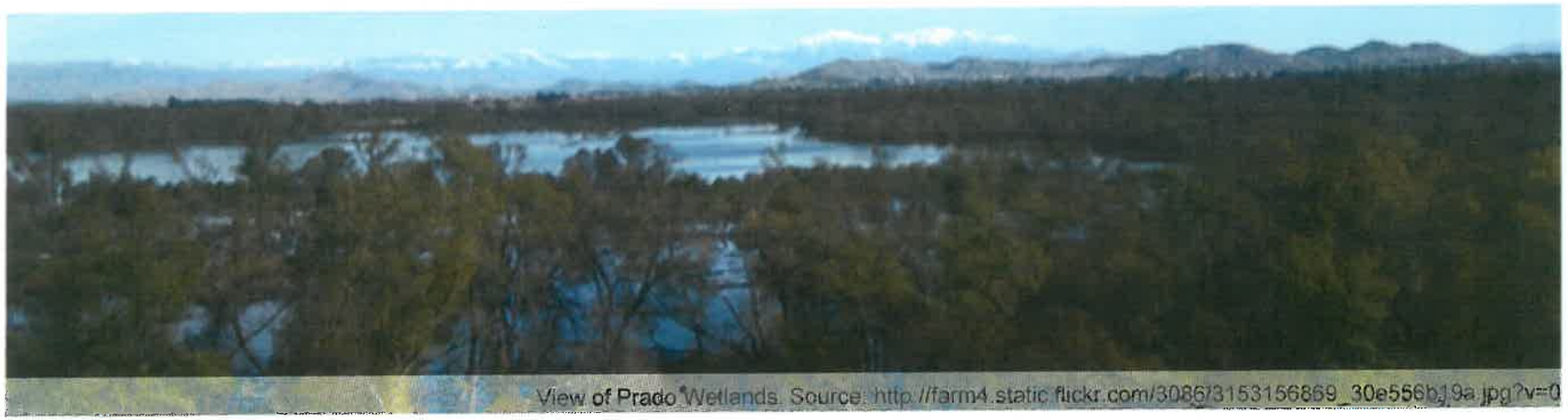
Prado Adaptive Management Plan (Prado AMP)

Mitigation Requirements of Hydraulic Control (Peace II Agreement, 2007)

- Monitor riparian habitat
- Water level
- Water quality
- Investigate factors impacting long-term sustainability
- Identify water management options to minimize impact

Prado AMP

- Prado AMP will establish its own baseline condition for hydrology & habitat
- Integrate the annual report findings with the Upper SAR HCP



View of Prado Wetlands. Source: http://farm4.static.flickr.com/3086/3153156869_30e556b19a.jpg?v=0

Upper Santa Ana River Habitat Conservation Plan (Upper SAR HCP)

- Collaborative Regional Project
  - Water Agencies within the watershed
  - Regulatory Agencies
  - 20+ stakeholder agencies
- Benefits
  - Builds on existing efforts
  - Efficient and cost-effective
  - Greater biological success
  - Mitigation banks

Least Bell's Vireo Source: US Fish & Wildlife Service

IEUA Projects

- Groundwater Recharge Basin expansions and diversions
- 30-year O&M permits for all existing operations
- 24 Basins and structures

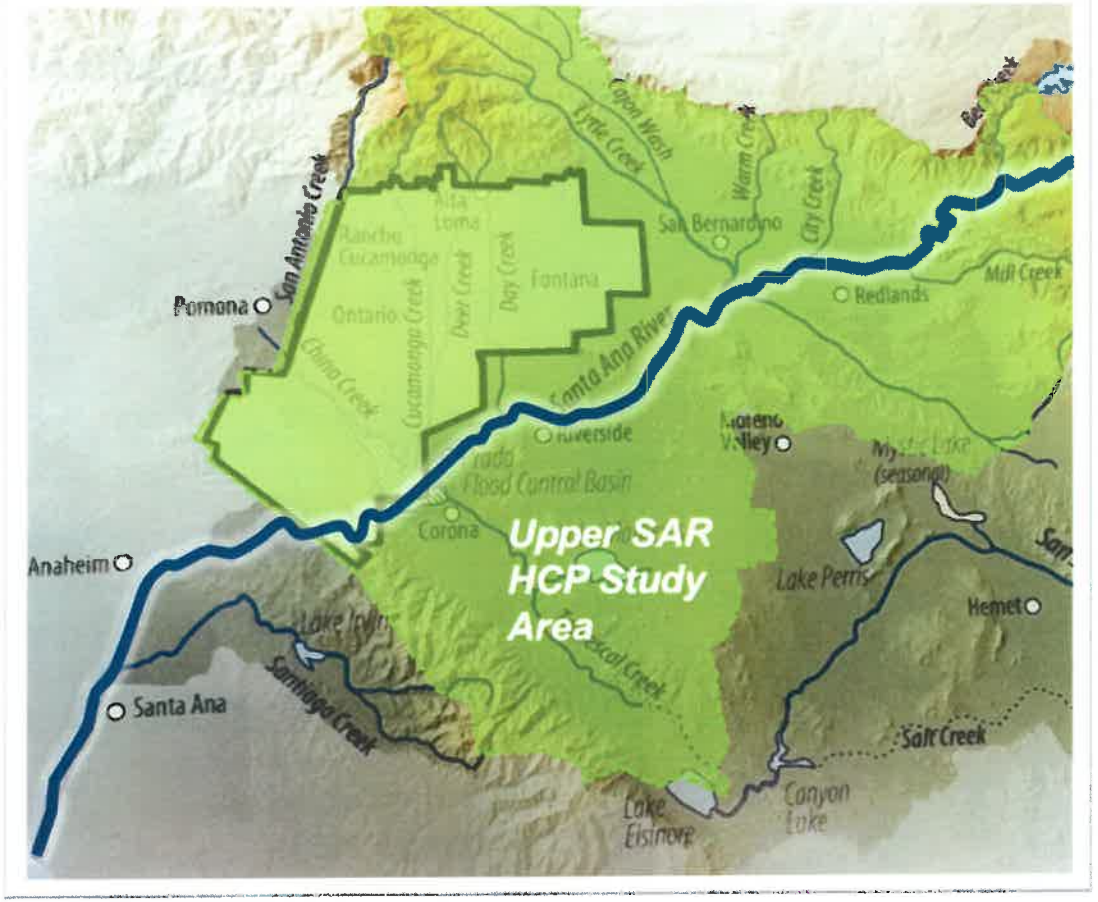
Upper SAR HCP Study Area

Includes Areas with:

- Covered Activities
- Covered Species
- Conservation Activities

863,000 Acres

- 35,000 = Riparian
- 22,000 = Water
- 425,000 = Upland
- 336,000 = Developed



Upper SAR HCP Considerations

The Upper SAR HCP will need a model developed for its Environmental/CEQA to depict impact to the river

- Model to establish groundwater and surface flow interaction
- Potential integration of model depict Chino Basin past, current and future groundwater operations
- Help define flow requirements to the Santa Ana river

Chino Basin Water Bank

- Chino Groundwater Basin is **one of the few basins** in California where levels increased during the drought due to conservation
- Maximizes water supply and beneficial use of the basin
- Conceptual framework discussions underway

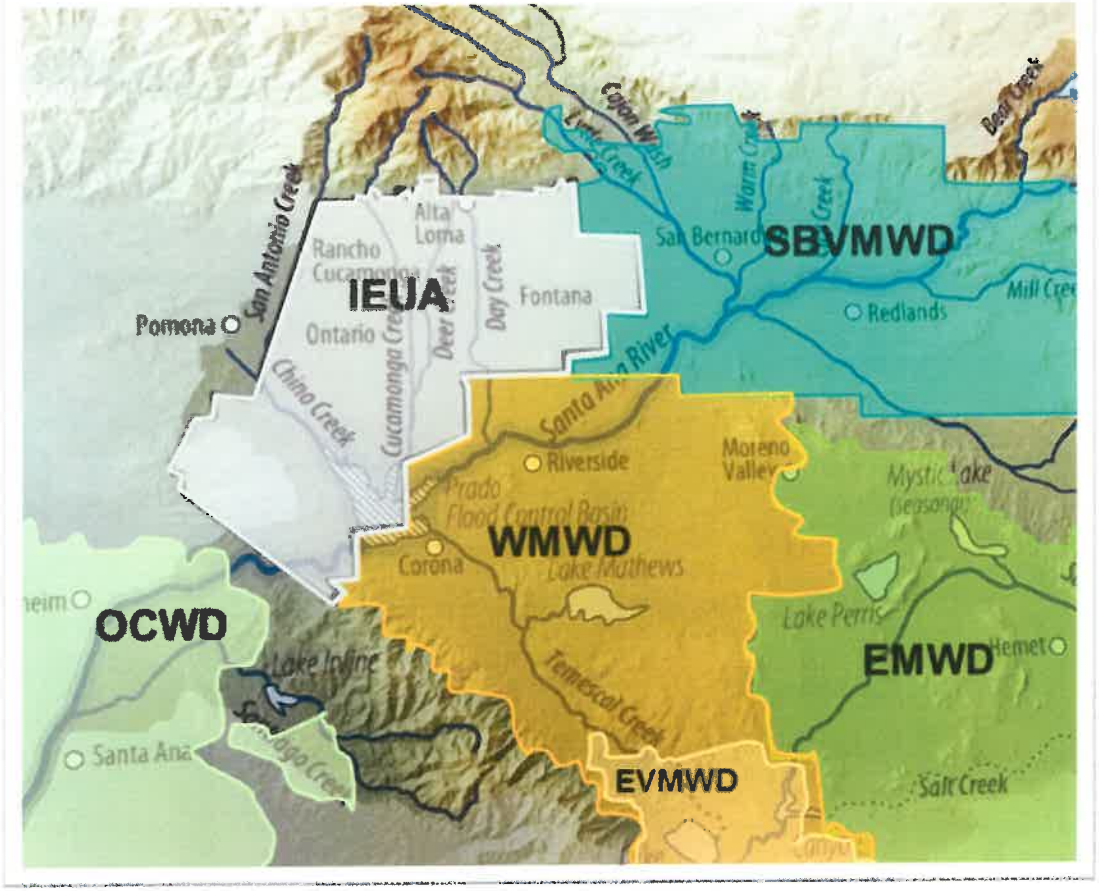
Modeling in the 2015 IRP highlighted the enormous potential for building stored groundwater in the Chino Basin in a wide range of water resource scenarios.

Water Bank : Items To Consider Moving Forward

- Current proposal is to create a planning Joint Powers Authority to develop the Chino Basin Water Bank
- Integration and administration of SARCCUP in Chino Basin
- Integration with Chino Basin storage discussions

Source: https://www.lawnstarter.com/blog/wp-content/uploads/2015/09/water.jpg

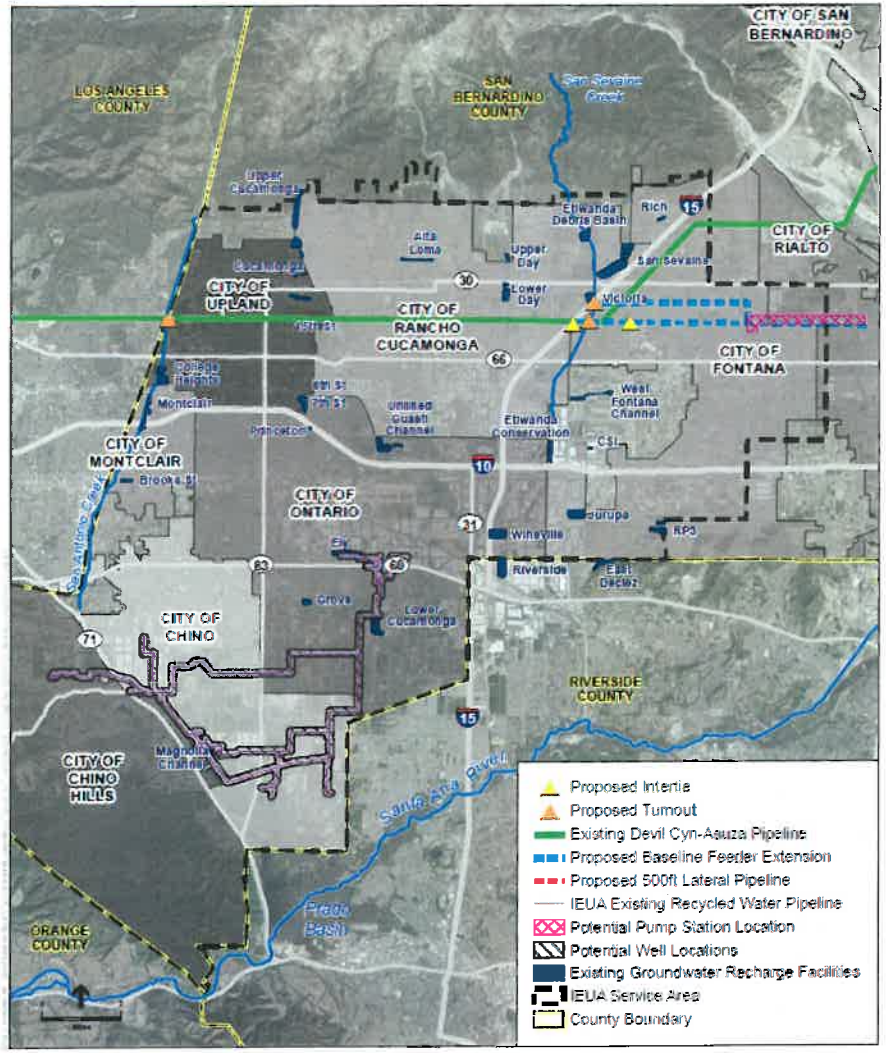
Santa Ana River Conservation and Conjunctive Use Program (SARCCUP)



- Five SAWPA Agencies project to increase supply reliability
- $100M ($55M grant, $9M local cost share)
- 180,000 AF groundwater storage
- Habitat Improvement
- Regional Water Use Efficiency with 7,200 AF annual water savings

SARCCUP: Chino Basin

- Chino Basin would function as storage reservoir
- Water quality improvements
- Potential to offset land subsidence
- Alternative imported water supply
- Assumes consensus on development of Chino Basin Water Bank
- Environmental/CEQA is led by IEUA, in process



SARCCUP: Items To Consider Moving Forward

- Local agency match share $9M each, with project completion by 2021
- MWD vs. Non-MWD storage programs
- Local commitment for storage
- Value of water supply vs cost of water supply (estimated supply cost @ MWD Tier 1 rate or higher)

Water Resource Management Final Thoughts

- IEUA and its member agencies have successfully developed water resources within the Chino Basin since the 1990s
- IEUA and Chino Basin Watermaster continue to work collaboratively in water resources development
- The 2015 Integrated Water Resources Plan (IRP) identified storage as the key water resource management strategy for the future

Are there other strategies to continue building collaboration & partnerships with regional stakeholders to further water resource developments?

Discussion

WORKSHOP

1B

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Date: February 1, 2017

To: The Honorable Board of Directors

From: P. Joseph Grindstaff
General Manager

Submitted by: Chris Berch
Executive Manager of Engineering/Assistant General Manager

Shaun Stone
Manager of Engineering

Subject: RP-1/RP-5 Expansion Preliminary Design Report (PDR) Board Workshop No. 3

RECOMMENDATION

This is an informational item for the Board of Directors.

BACKGROUND

On January 20, 2016, the Board of Directors awarded the Contract for Engineering Preliminary Design Services for the RP-1/RP-5 Expansion Preliminary Design Report (PDR) to Parsons Water & Infrastructure Inc. The Parsons/Agency project technical team initiated work on the first series of preliminary predesign technical memorandums, which is detailed in Table 1 below.

Table 1: First Series Technical Memorandum Topics

Number	Topic	Description
1	CCWRF	Decommissioning of Carbon Canyon Water Recycling Facility
2	RP-1 Equalization	Elimination of RP-1 Primary Effluent Flow Equalization
3	Centrate Treatment	RP-1 & RP-5 onsite Centrate Treatment and Offsite Recycled Flow Discharge
4	RP-5 Secondary	RP-5 Liquids Treatment Alternative Technology, Secondary Treatment
5	RP-5 Capacity	Expand RP-5 to Ultimate Capacity

On May 11, 2016, Agency staff conducted the first Board Workshop covering the topics of the first series of technical memorandums and received Board concurrence on the following recommendations:

- Maintain operations of CCWRF indefinitely while completing the appropriate level of repair and refurbishment projects to ensure safe and compliant operation of the facility.
- RP-5 Secondary Treatment will be accomplished through a membrane bio-reactor (MBR) process, which will simplify operations of the facility and improve effluent water quality.
- Under the current expansion project, fully expand RP-5 to 30 MGD, ultimate flow of the facility with CCWRF in operation, as this approach provided the lowest lifecycle cost for the ultimate expansion of the facility.

On October 5, 2016, Agency staff conducted the second Board Workshop covering the topics of the second series of technical memorandums. The second series of technical memorandums provided much of the basis for the treatment processes of the new RP-5 facilities and is detailed in Table 2 below.

Table 2: Second Series Technical Memorandum Topics

Number	Topic	Description
1	RP-5 Liquids Treatment	Influent Pump Station, Screening, Grit Removal, Primary Clarification, Disinfection, Condition Assessment, & Odor Control
2	RP-5 Solids Treatment	Solids Thickening, Digestion, Dewatering, & Digester Gas Conveyance/Storage/Safety Flaring
3	Food Waste	Comparative Analysis of RP-1, RP-5, & RP-5 Solids Handling Facility including Receiving, Digestion, Dewatering, & Digester Gas Usage
4	Digester Gas Usage	Comparative Analysis of Internal Combustion Engines (Existing/New), Micro Turbines, Natural Gas Pipeline Injection, & CNG Vehicle Fuel including potential for future phasing

The major recommendations and Board concurrence resulting from the second series of technical memorandums included the following:

- The RP-5 Liquids Expansion is recommended to consist of the following:
  - Influent Pump Station Expansion
  - Headworks improvements including: bar screens, vortex grit chamber, fine screens for MBR, and a screenings/grit building
  - 2 primary clarifiers
  - Existing Aeration Basin Improvements
  - Demolition of 2 clarifiers and construction of a 30 MGD MBR system for improved water quality
  - UV disinfection system for improved water quality

  - A centralized odor control facility to meet the objectives of the Agency's Business Goals.
- The RP-5 Solids Facility is recommended to consist of the following:
  - Solids thickening using rotary drum thickeners
  - Phased digestion including acid phase digesters and methane digesters
  - Digested sludge storage
  - Centrifuge dewatering building, biosolids cake storage, and centrate equalization
  - Digester gas treatment and gas flaring
- The development of a hybrid food waste system between RP-5 and RP-5 Solids Handling Facility that will allow for approximately 50,000 gallons per day of organics waste diversion through 2030.
- RP-5 digester gas will be utilized in the existing Renewable Energy Efficiency Project (REEP) internal combustion engines as the food waste program is being developed and expansion of the digester gas utilization system will be re-evaluated as the program matures.

Since the second Board Workshop, the Parsons/Agency project technical team has begun work on the third and final series of technical memorandums for the PDR. In December 2016, the third major technical workshop, which is detailed in Table 3 below, was conducted with Agency staff.

Table 3: Third Series Technical Memorandum Topics

Number	Topic	Description
1	RP-1 Liquids Treatment	Headworks, Screening, Grit Removal, Primary Clarification, Secondary Treatment, Disinfection, Condition Assessment, & Odor Control
2	RP-1 Solids Treatment	Solids Thickening, Digestion, Dewatering, Digester Gas Utilization, & Odor Control
3	Advanced Water Treatment	Comparative Analysis of Advanced Water Treatment at RP-1 & RP-5 for Total Dissolved Solids Reduction and Indirect Potable Reuse
4	RP-5 Offsite Facilities	Inland Empire Brine Line Discharge Station Relocation & Mountain Ave. Lift Station

The major recommendations resulting from the third series of technical memorandums will be presented to the Board of Directors through the RP-1 & RP-5 Expansion PDR Board Workshop No. 3 to be conducted on February 1, 2017.

The RP-1/RP-5 Expansion PDR is consistent with the *IEUA's Business Goal of Wastewater Management* specifically the Water Quality objective that IEUA will ensure that systems are planned, constructed, and managed to protect public health, the environment, and meet anticipated regulatory requirements.

PRIOR BOARD ACTION

On January 20, 2016, the Board of Directors approved the consulting engineering services contract award for the RP-1/RP-5 Expansion PDR to Parsons Water & Infrastructure Inc. for the not-to-exceed amount of $2,431,598.

IMPACT ON BUDGET

The approved TYCIP budgets for Project No. EN19001, RP-5 Liquids Treatment Expansion, and Project No. EN19006, RP-5 Solids Treatment Facility, are $125,000,000 and $136,000,000, respectively. With the recommendations presented during the first, second, and third Board Workshops, the total project cost for the RP-5 Liquids Treatment Expansion, Project No. EN19001, is estimated to increase to $160,000,000. In addition, the total project cost for the RP-5 Solids Treatment Facility, Project No. EN19006, is estimated to increase to $165,000,000.

There are no budget impacts to the current phase of the project.

Attachments:

1. RP-1 & RP-5 Expansion PDR Third Series Draft Technical Memorandum Package

   https://dl.dropbox.com/s/htmy1ihwjg5oxd9/RP-1%20%26%20RP-5%20Expansion%20PDR%20Third%20Series%20Draft%20TM%20Package.pdf?dl=0

PJG:CB:SS:jm

RP-1 & RP-5 Expansion PDR
Board Workshop No. 3
February 1, 2017



Jason Marseilles, P.E.
Senior Engineer

Inland Empire Utilities Agency
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Prior Board Workshops

Decommissioning of CCWRF

CCWRF to Remain in Operation

RP-5 Secondary Treatment System Alternatives

Full MBR System

Ultimate Expansion of RP-5

Expand to 30 MGD

RP-5 Liquids & Solids Treatment Systems

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Board Workshop No. 3 Objectives

RP-1 Liquids Treatment Alternatives

RP-1 Solids Treatment Alternatives

Advanced Water Treatment

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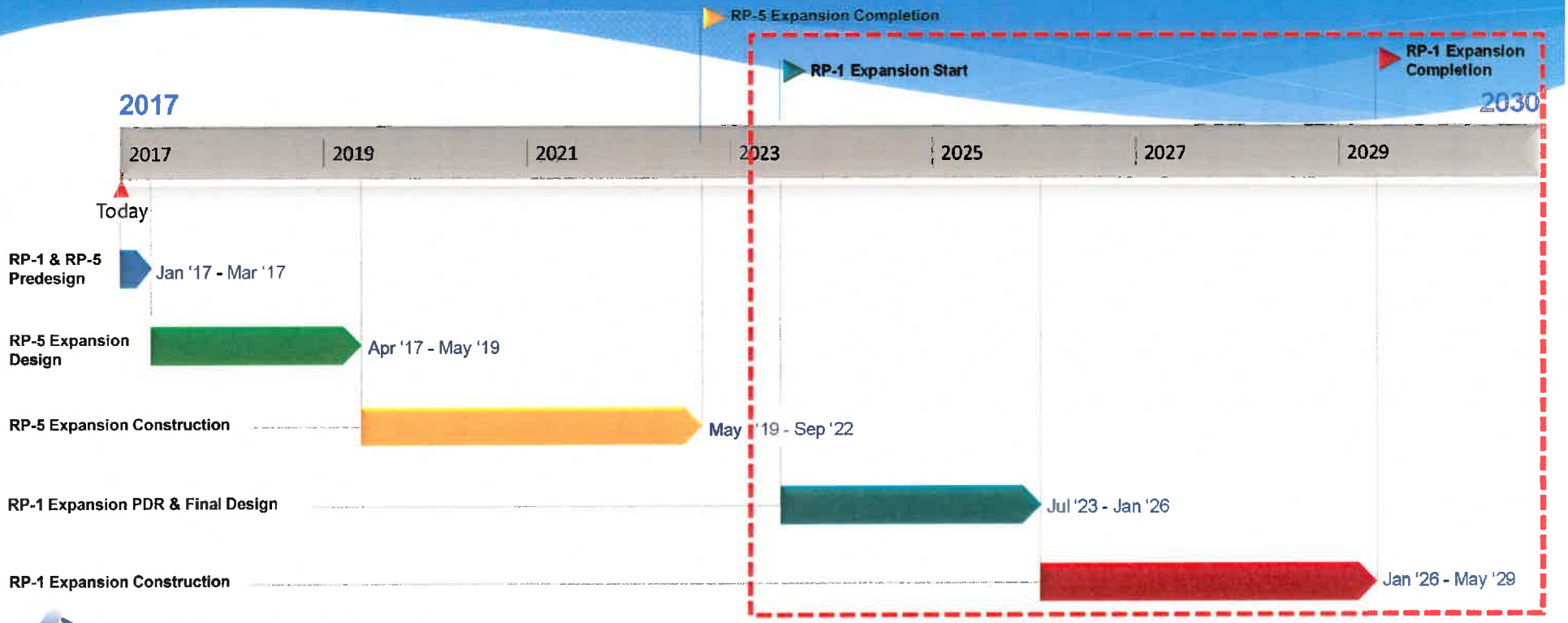
RP-1 & RP-5 Expansion Schedule



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RP-1 Liquids Treatment Expansion

Headworks & Primary

Secondary Treatment

Tertiary Treatment

Liquids Treatment Cost

Regional Water Recycling Plant No. 1

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RP-1 Liquids Treatment Expansion: Headworks & Primary Treatment

Headworks

Replace bar screens & rehab the existing grit removal system: $5M

Option 1

New Headworks Facility: $31M

Option 2

Primary Treatment

Install clarifier covers & replace clarifiers skimmers, drives, and pumps

Expand intermediate pump station & lagoon splitter box

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RP-1 Liquids Treatment Expansion: Secondary Treatment Design Objectives

- Increase raw sewer influent capacity from 32 MGD to 40 MGD
- Eliminate Primary Effluent Equalization
- Provide capacity for centrate treatment

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RP-1 Liquids Treatment Expansion: Secondary Treatment Alternatives

RP-1 Secondary Treatment System

Alternative 1
Construct additional CAS trains for expanded capacity

Alternative 2
Construct standalone MBR system for expanded capacity ONLY

Alternative 3
MBR Retrofit; one additional pre-aeration basin for redundancy

Alternative 4
MBR Retrofit; no additional pre-aeration basins

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Secondary Treatment Alternative No. 1

Alternative 1

Construct additional CAS trains for expanded capacity

- Intermediate Pump Station Expansion
- Aeration basin influent and effluent channel modifications
- Four additional Pre-aeration trains
- Four additional secondary clarifiers

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Secondary Treatment Alternative No. 2

Alternative 2

Construct standalone MBR system for expanded capacity ONLY

- Intermediate Pump Station Expansion
- Aeration basin influent and effluent channel modifications
- Fine Screens
- Four additional Pre-aeration trains
- MBR System

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Secondary Treatment Alternative No. 3

Alternative 3

MBR Retrofit; one additional pre-aeration basin for redundancy

- Intermediate Pump Station Expansion
- Aeration basin influent and effluent channel modifications
- Fine Screens
- One redundant Pre-aeration trains
- MBR System

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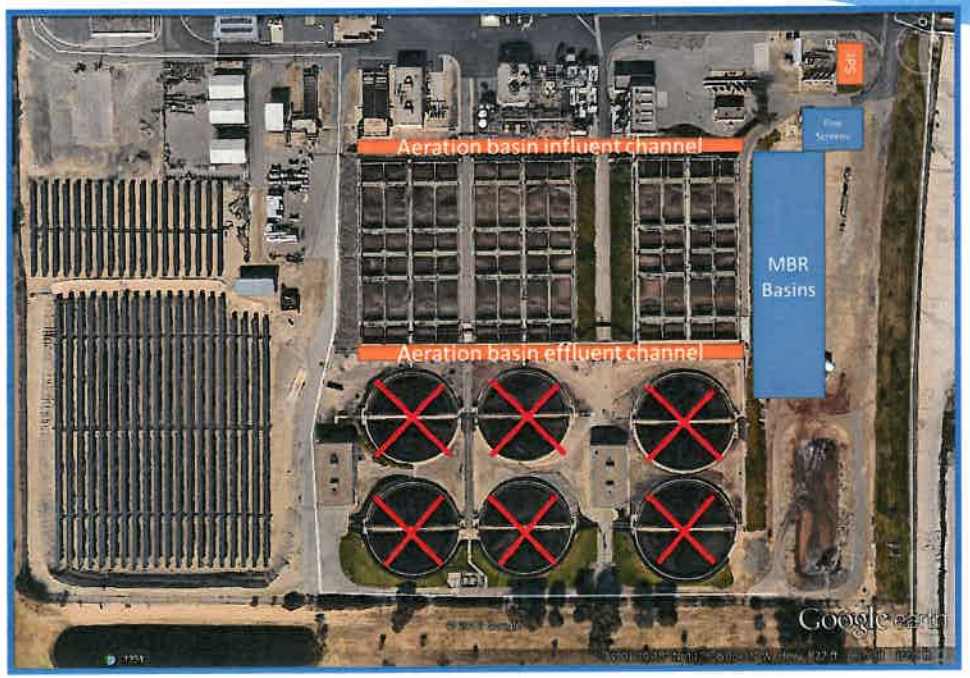
Secondary Treatment Alternative No. 4



Alternative 4

MBR Retrofit; no additional pre-aeration basins

- Intermediate Pump Station Expansion
- Aeration basin influent and effluent channel modifications
- Fine Screens
- MBR System

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RP-1 Liquids Treatment Expansion: Secondary Treatment Alternatives Analysis

Alternative	Benefits	Drawbacks
Alternative 1 – CAS	• Familiar technology • Functions well currently • Lowest capital cost	• Largest footprint • No improvement in effluent quality
Alternative 2 – Standalone MBR	• Reduced footprint compared to Alt. 1 • Produces 14 mgd of high-quality water • May eliminate future need for MF prior to RO	• Difficulty in operation of two parallel treatment trains
Alternative 3 – MBR Retrofit with additional train	• Reduced footprint • 40 mgd of high-quality water • Maintain and operate only one treatment system • No diversion to RP-5 required during construction • May eliminate future need for MF prior to RO	• Highest capital cost
Alternative 4 – MBR Retrofit without additional train	• Requires the smallest footprint • 40 mgd of high-quality water • One treatment system • May eliminate future need for MF prior to RO	• Requires diversion to RP-5 during construction and outages • Higher capital cost than Alternatives 1 and 2

RP-1 Liquids Treatment Expansion: Secondary Treatment Cost Analysis

Secondary Treatment Alternative	Capital Cost
Alt 1: CAS	$92.1 M
Alt 2: Stand alone MBR for additional capacity	$107.7M
Alt 3: MBR Retrofit with additional train	$163.8 M
Alt 4: MBR Retrofit without additional train	$151.5 M

RP-1 Secondary Treatment System

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RP-1 Liquids Treatment Expansion: Secondary Treatment Staff Recommendation

Alternative No. 4: MBR Retrofit without Additional Train

Capital Cost
$151.5 M

Benefits	Drawbacks
• Smallest footprint • High-quality water • One treatment system • May eliminate future need for MF prior to RO	• RP-5 diversion during construction / outages • Higher capital cost than Alternatives 1 and 2

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RP-1 Liquids Treatment Expansion: Tertiary Treatment

Tertiary Treatment

Modifications to Lagoon 3 to allow for secondary effluent equalization

Existing chlorine contact tanks provide sufficient detention time at peak flow.

Tertiary filters are adequate for ultimate capacity with secondary equalization.

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RP-1 Liquids Treatment Expansion: Project Cost

Secondary Treatment Alternative	Secondary Cost	Cost for Other Treatment Systems	Total Project Cost
Alt 1: CAS	$92.1 M	$30.9 M	$123.0 M
Alt 2: Stand alone MBR for additional capacity	$107.7M		$138.6M
Alt 3: MBR Retrofit with additional train	$163.8 M		$194.7 M
Alt 4: MBR Retrofit without additional train	$151.5 M		$182.4 M

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RP-1 Solids Treatment Expansion

Thickening

Dewatering

Digestion

Solids Treatment Cost

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RP-1 Solids Treatment Expansion

Thickening

Replace GTs & DAFT's with Rotary Drum Thickeners (7+1)

Digestion

New Acid Phase Digesters (2+1) & Recuperative Thickening RDT's (1+1)

Dewatering

Existing Dewatering Sized for Ultimate Capacity

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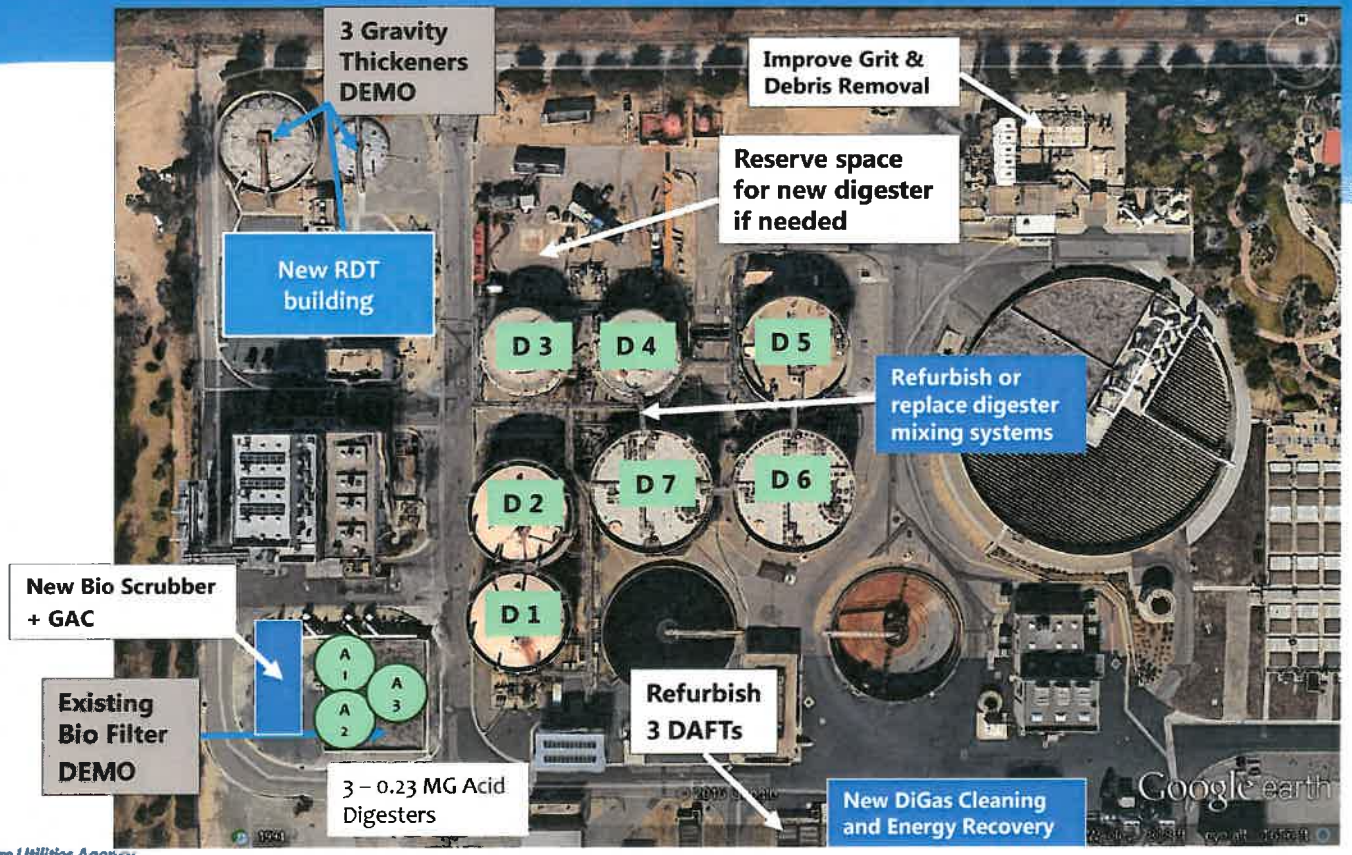
RP-1 Solids Treatment Expansion Layout



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RP-1 Expansion Project Cost

RP-1 Solids Project Cost

Major Systems	Cost
Thickening	$19.8M
Digestion	$11.5M
Dewatering	$0.7M
Odor Control	$4.3M
Estimated Construction Cost*	$36.3M
Design & Project Management (30%)	$10.9M
Estimated Project Cost	$47.2M

RP-1 Liquids Project Cost

Major Systems	Cost
Headworks & Primary	$9.4M
Secondary	$119.8M
Tertiary	$0.8M
Odor Control	$10.3M
Estimated Construction Cost*	$140.3M
Design & Project Management (30%)	$42.1M
Estimated Project Cost	$182.4M

Estimated RP-1 Expansion Project Cost: $230M

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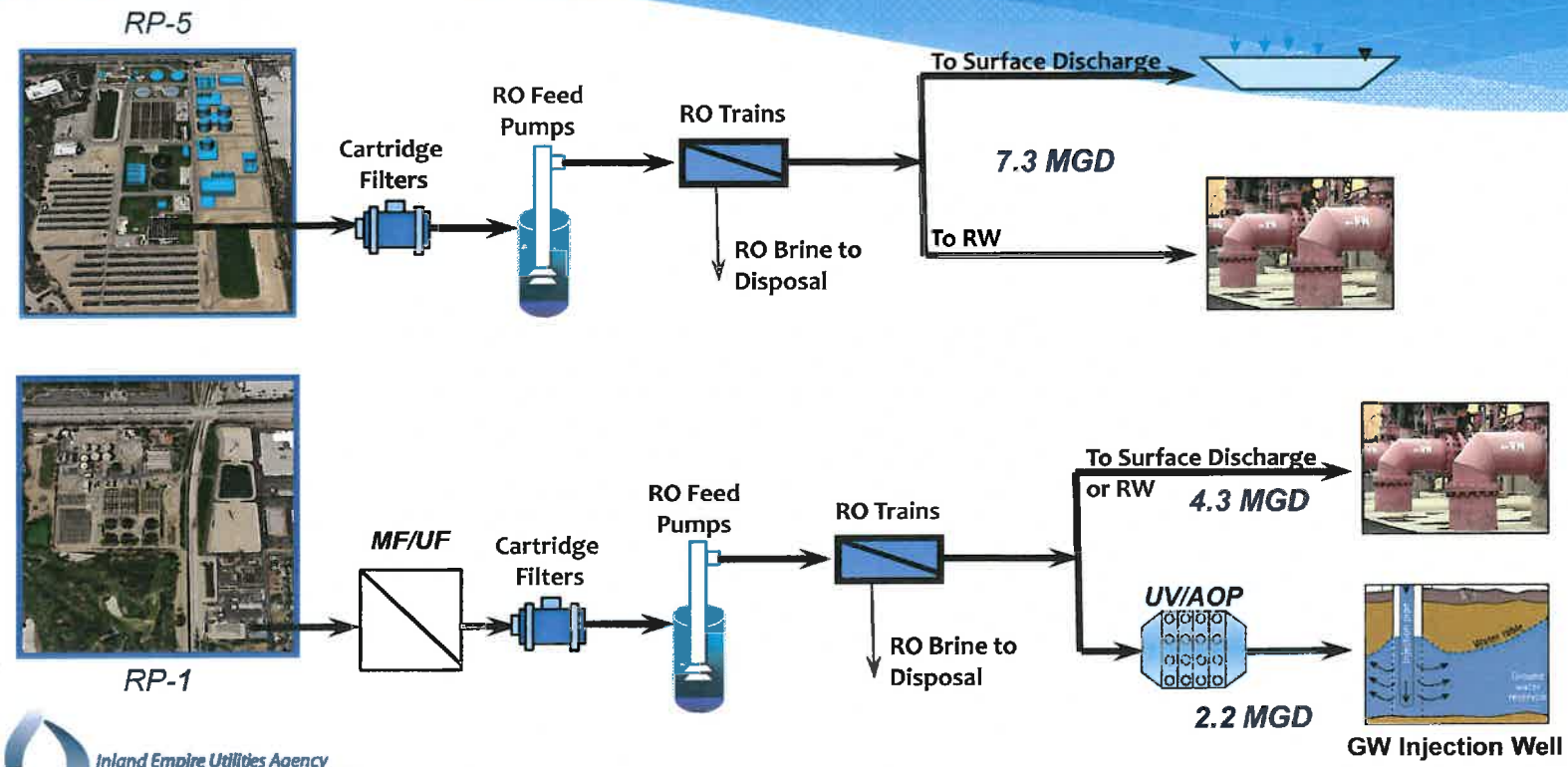
Advanced Water Treatment (AWT)

Alternatives

Project Cost

Recommendation

Advanced Water Treatment Alternatives



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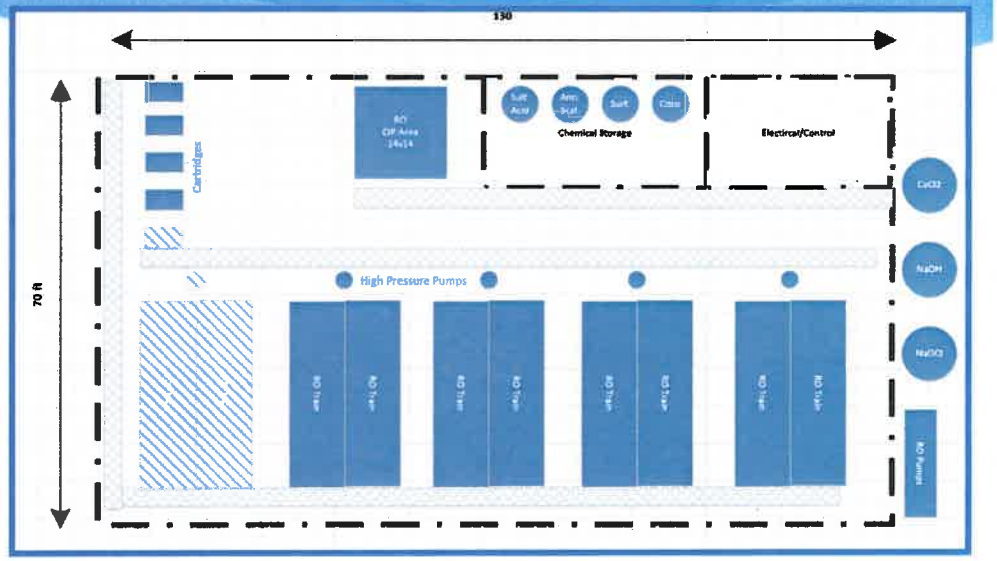
Advanced Water Treatment Alternatives

Advanced Water Treatment Alternative	Facility	Description	Capital Cost	O&M Cost
Alt 1: TDS Blending (RO Only)	RP-1 & RP-5	7.3 mgd to surface discharge/recycle water	$40.2 M	$3.4 M
Alt 2: Indirect Potable Reuse (IPR)	RP-1	2.2 mgd to groundwater injection well	$39.7 M	$2.5 M
Alt 3: TDS Blending + IPR	RP-1	4.3 mgd to surface discharge/recycle water + 2.2 mgd groundwater injection	$64.8 M	$4.2 M

Advanced Water Treatment at RP-5

RP-5 Tertiary Treatment



Reverse Osmosis Building Layout

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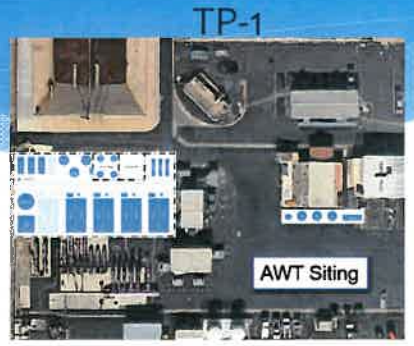
Advanced Water Treatment Staff Recommendation

Do Not Construct AWT at RP-5

- More time to design & construct
- Proximity to GW recharge basins and IPR sites
- Less expensive RO Brine disposal

Potential Locations



Injection Points Near Recharge Basins

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Points For Discussion

RP-1 Liquids Treatment

RP-1 Solids Treatment

Advanced Water Treatment

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