California Adaptation Forum 2023

Critical Infrastructure and Partnerships on the Road Towards Water Resiliency

SAWPA and Member Agencies

Critical Infrastructure and Partnerships on the Road Towards Water Resiliency Session

SAWPA

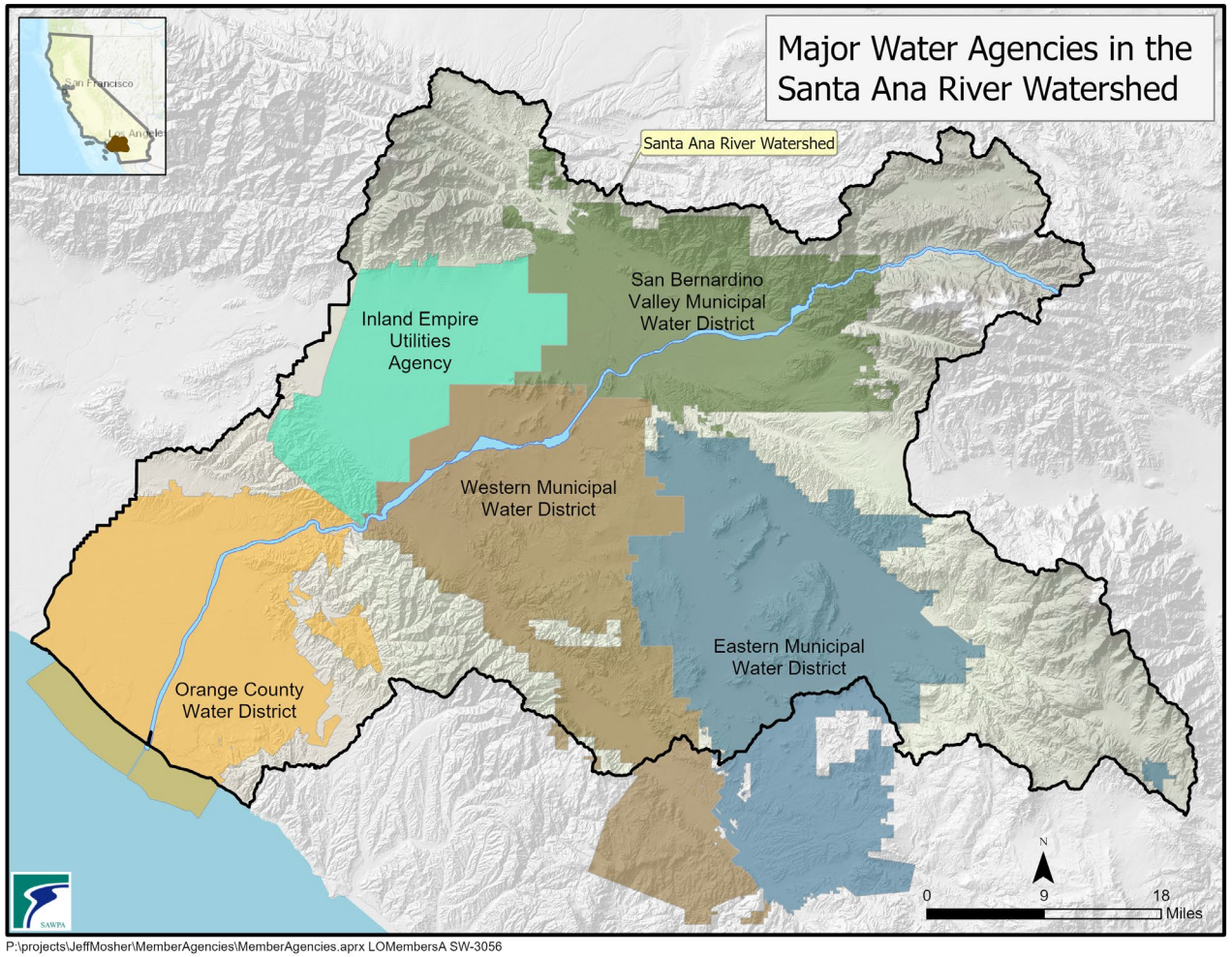
SANTA ANA WATERSHED PROJECT AUTHORITY

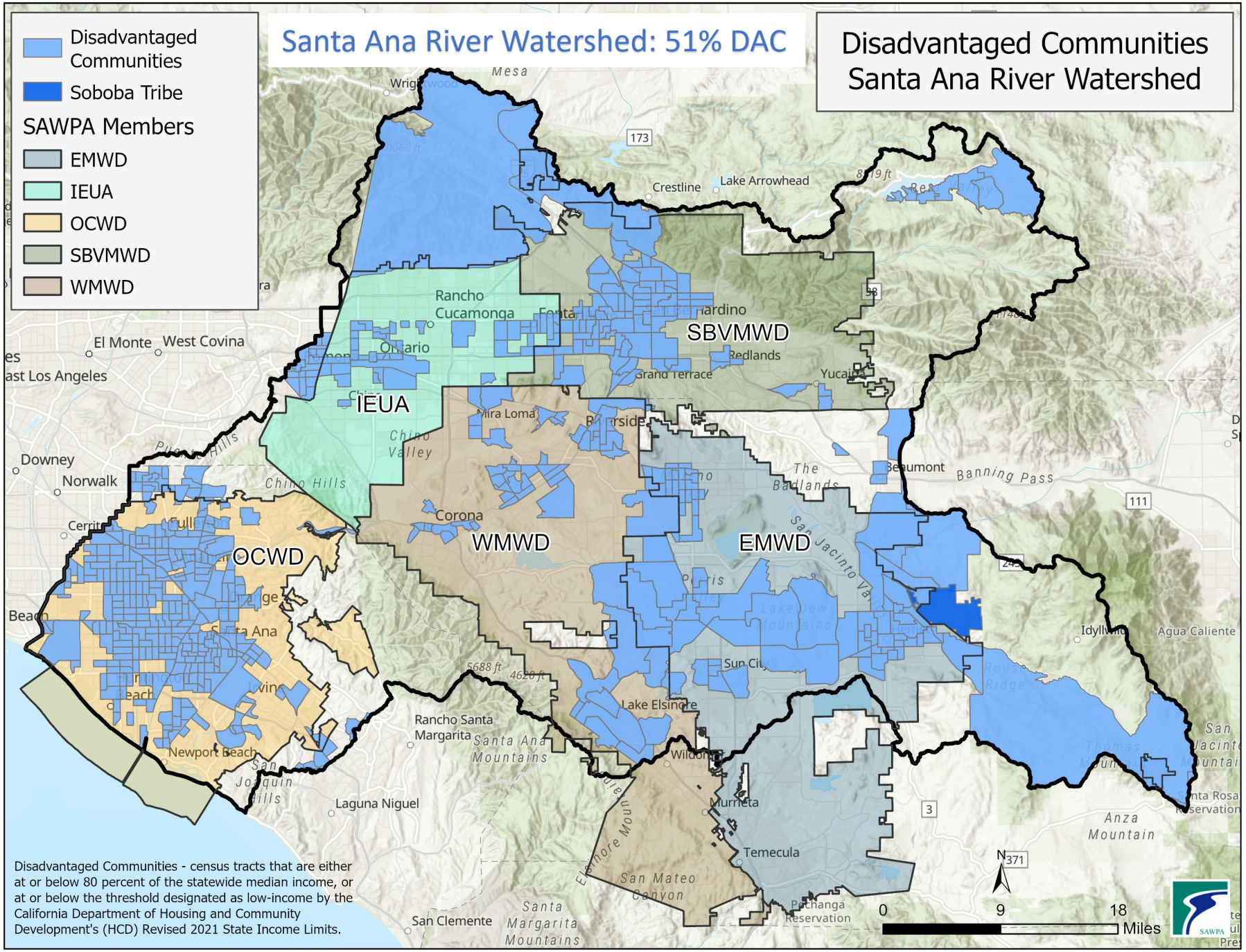
CAF Forum Session
(Session ID: 2F)

August 2, 2023
10:15 am – 11:45 am

Santa Ana Watershed Project Authority (SAWPA)

- Joint Powers Authority
  - 5 member agencies
- Watershed
  - 6 million people
  - 2,650 mi^2
  - 3 counties
- SAWPA Activities
  - Inland Empire Brine Line
  - Watershed Planning
  - Roundtables for Stakeholders





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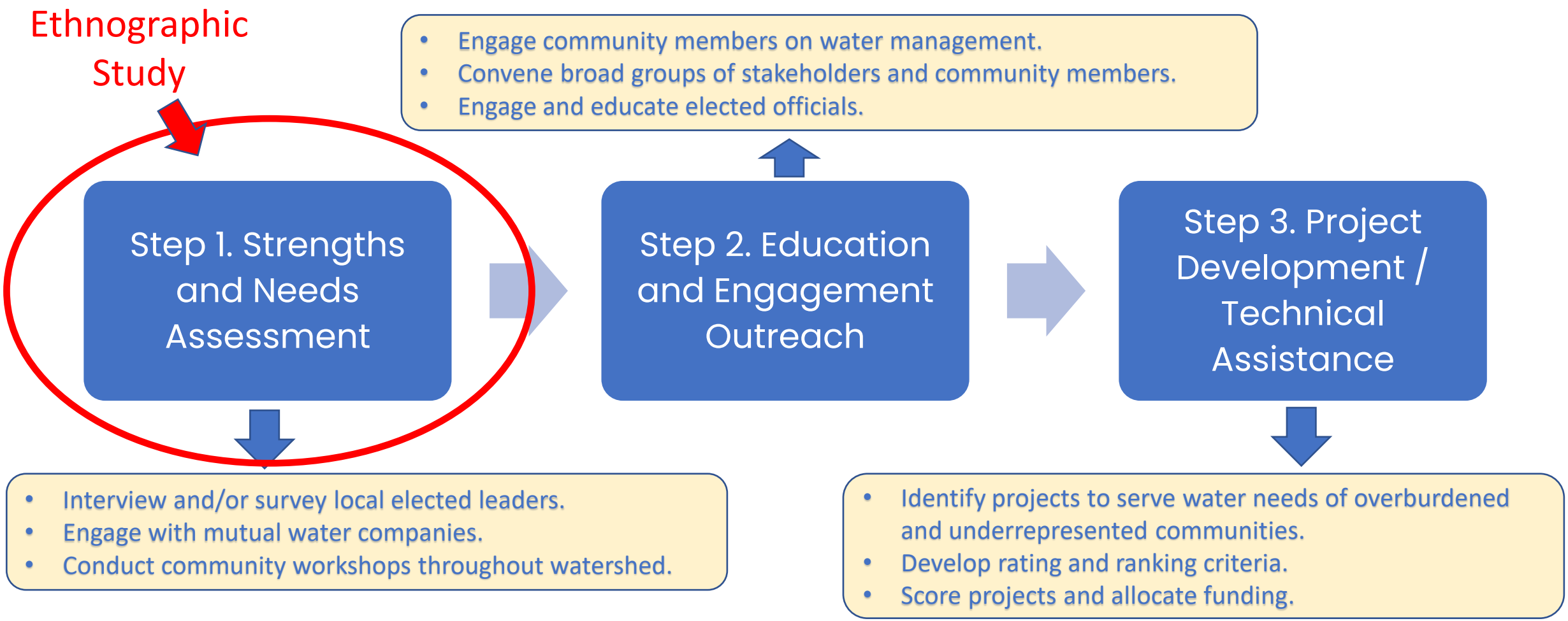
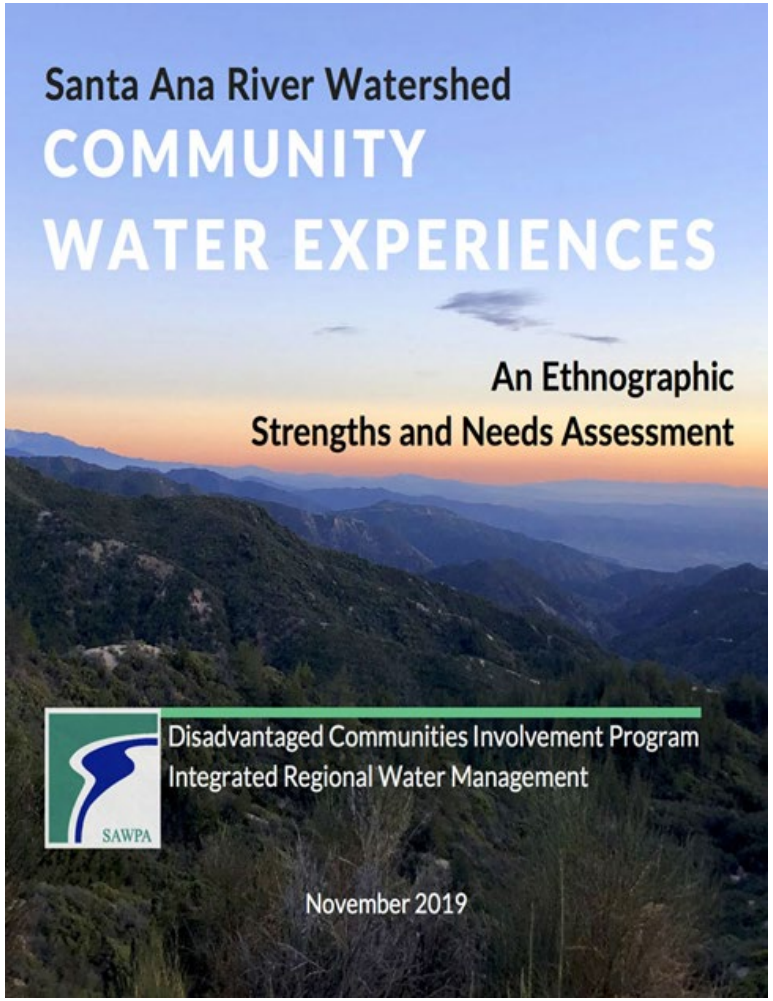
SAWPA DCI Program ($3.5M DWR Grant)



SAWPA's Disadvantaged Community Involvement Program: An Ethnographic Strength and Needs Assessment

- Ethnology:
  - Study of people in their own environment using participant observation and face-to-face interviewing
- Civic ethnography:
  - Mobilizes local knowledges and regional resources.
  - Water agencies can design programs and policies that more accurately reflect community strengths and needs,
  - Results in strengthening community sustainability and resilience.
- Key partner:
  - University of California, Irvine's Department of Anthropology



Why Ethnography

- Communities face challenges that demand new ways of engaging local voices.
- Equitable planning processes reflect the needs of the communities being served.
- Social-science research suggests that agencies must build community involvement into early phases of planning.
- Civic ethnography mobilizes local knowledges and regional resources.
- Better distribute resources to alleviate needs.
- Sustained efforts needed to involve communities equitably in planning decisions.
- Remake public servants' relationships with communities.
- Enables partners within government, local organizations, and academia to listen and respond to communities.

Ethnographic Approach

Four Key activities:

- Engagement
- Listening
- Analysis
- Community conversation Report-backs

Engaged various social groups

- Native communities
- Diverse local communities
- Elected officials
- Mutual water companies

Core Tenants of Community Engagement

Listen

Respectful listening fosters community "inreach" and knowledge sharing as opposed to uni-directional "outreach"

Value Local Expertise

People are experts on their own communities and experience(s)

Understand Belonging

Each person is a member of multiple communities. These communities are defined shared experiences, values, and perspectives, not simply by geographic boundaries

What We Heard: Underrepresented Communities

- Homelessness
- Water Quality
- Social Dynamics
- Open or Green Public Space
- Communication
- Water Management
- Safety and Hazards

"One thing that I am very thankful for [here] is . . . the easy access to the water, and . . . the treatments that they do to the water to make it drinkable."

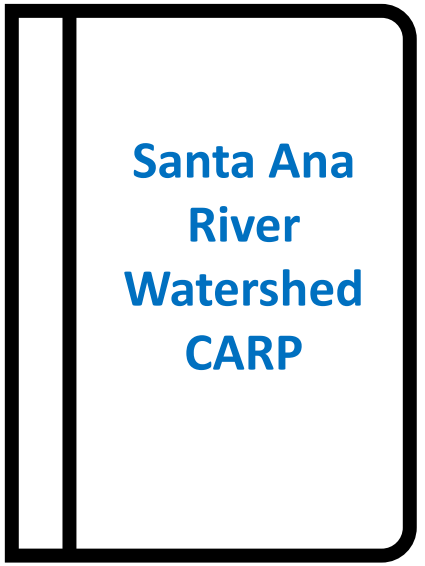
- Immigrant Community Leader

Activities Resulting from Ethnographic Process

SAWPA Climate Adaptation and Resiliency Planning

1. SAWPA's Existing Watershed Plan

2. Assess Climate Risks and Vulnerabilities



3. Develop "Climate Adaptation and Resiliency Plan"

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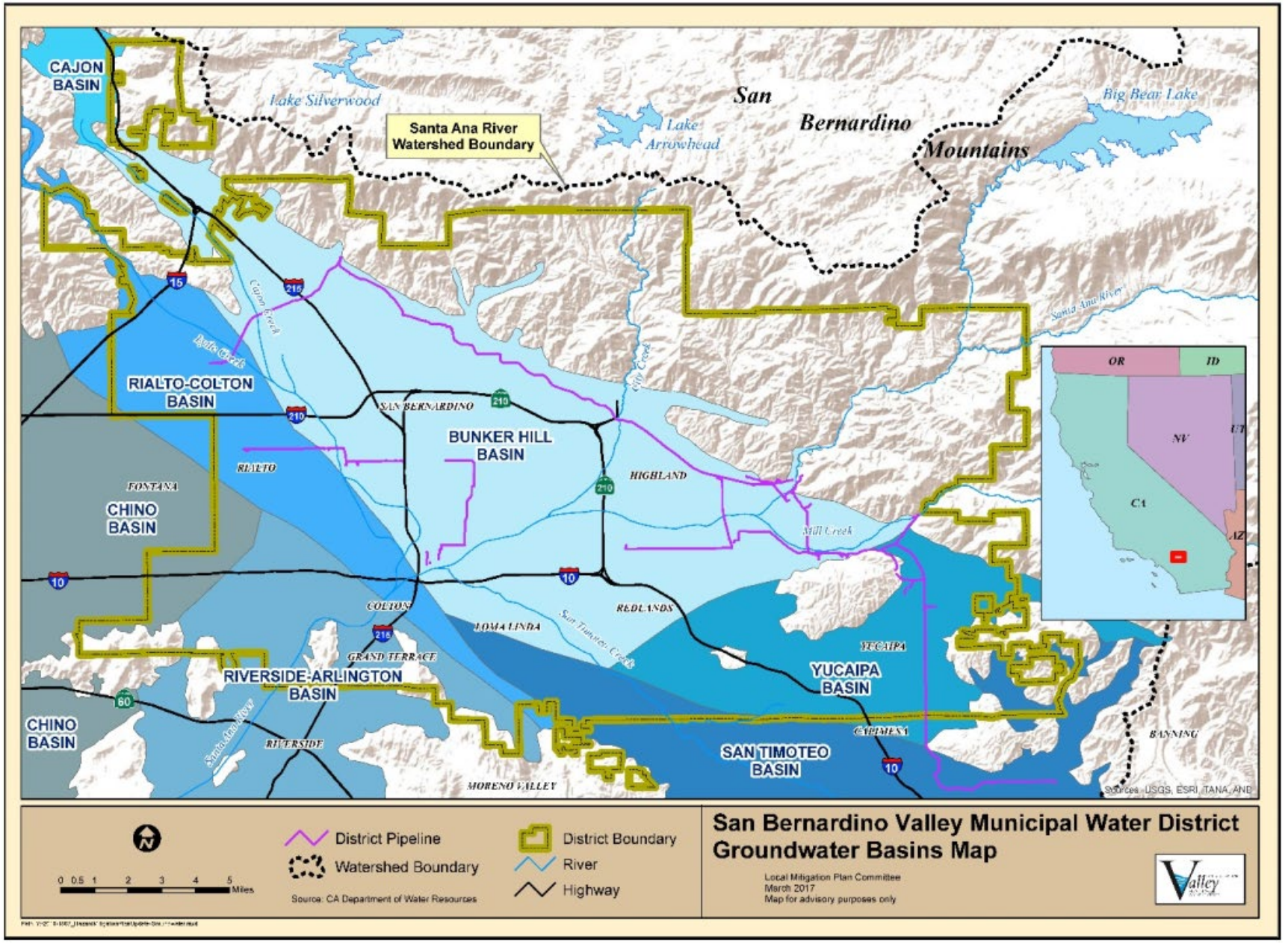
San Bernardino Valley Municipal Water District

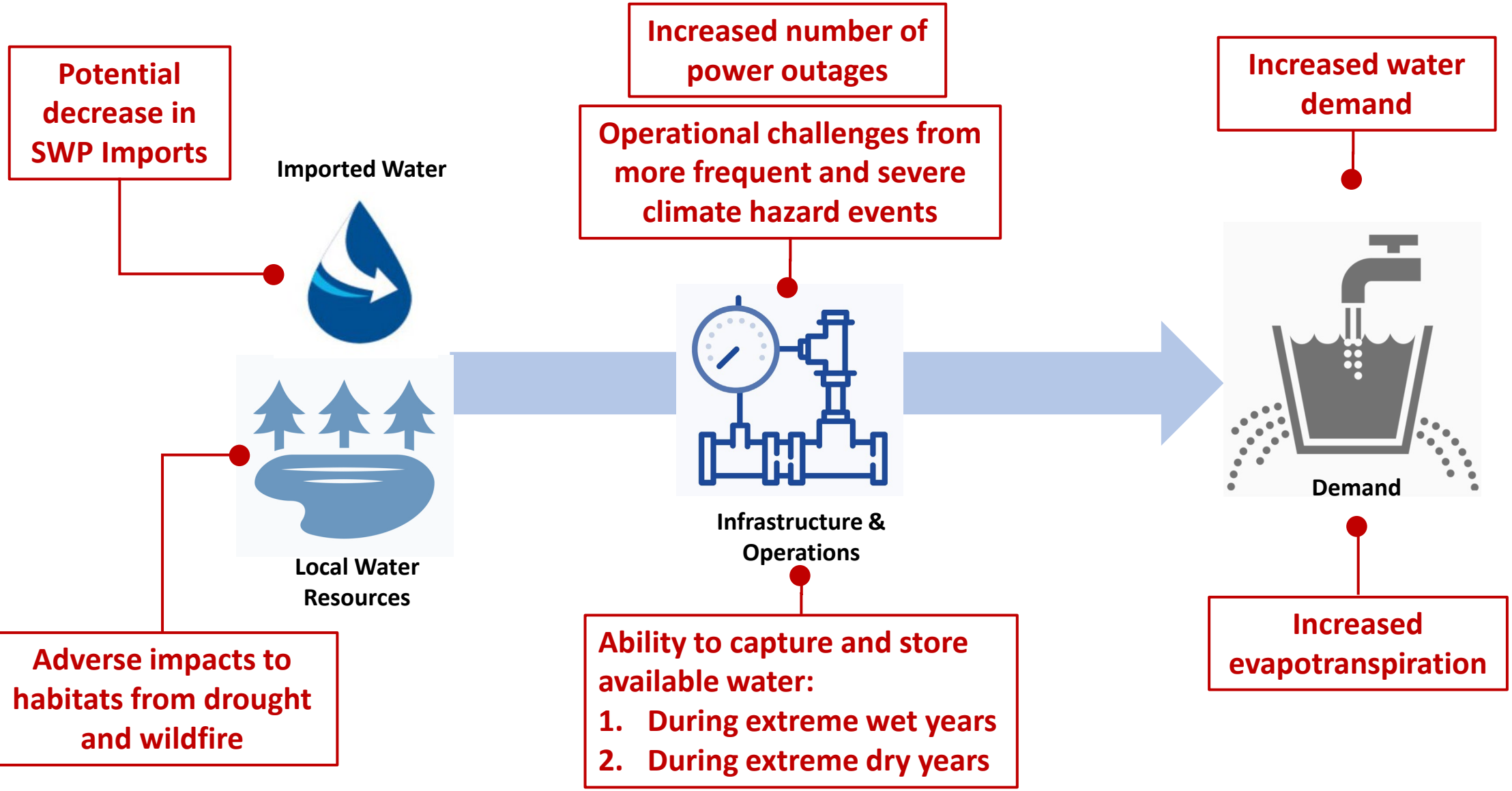
July 2023

San Bernardino Valley Water District



- Formed in 1954 as a regional agency to establish long-range water supply for the San Bernardino Valley
- Responsible for managing groundwater storage within its boundaries on behalf of the groundwater producers
- Imports water into its service area for direct use and groundwater replenishment through participation in the State Water Project (SWP)
- Covers about 353 square miles in southwestern San Bernardino County and serves a population of about 710,000
- It delivers water to 15 retail agencies and for groundwater recharge via 42 miles of pipelines.

Climate Vulnerabilities



Resilience is a strategic priority

MISSION
VISION
VALUES
PRIORITIES
STRATEGIES

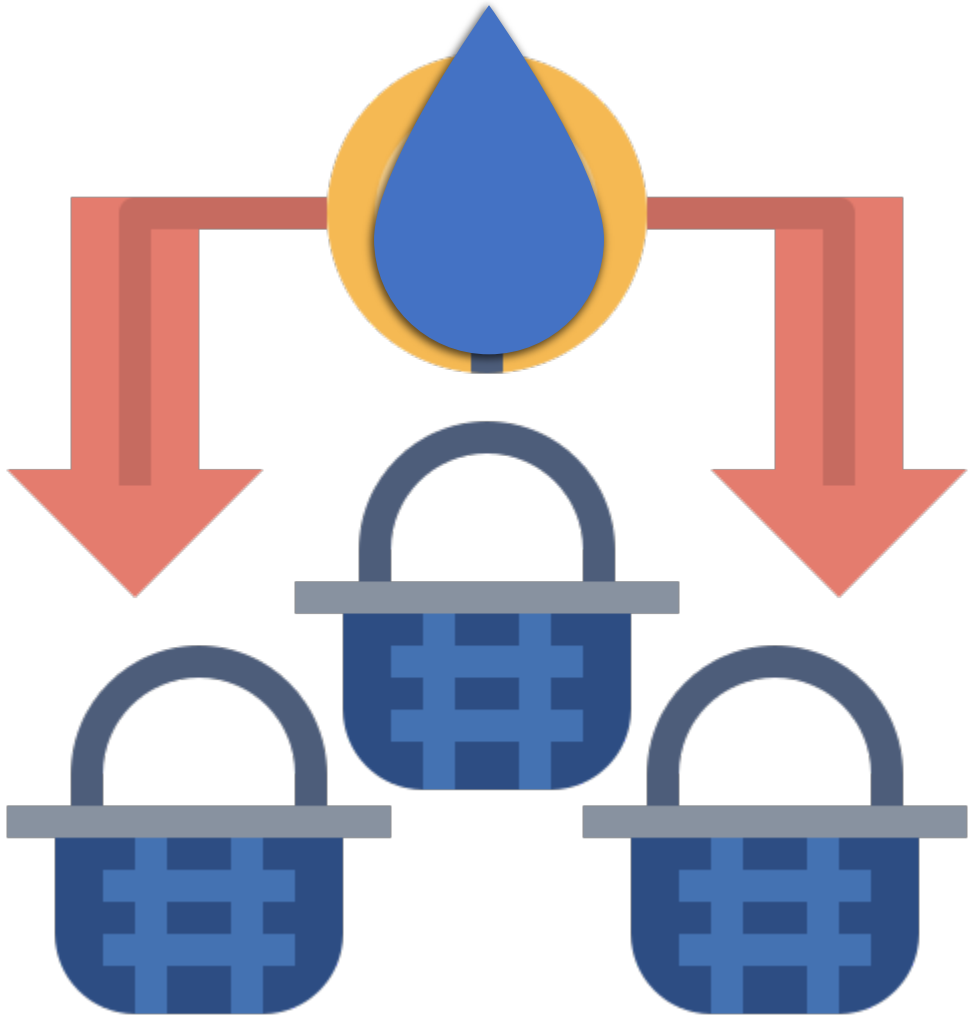
OUR *strategies* ARE TO...

1. Achieve climate resilience through prioritized adaptation and mitigation.
2. Proactively manage a diverse, adaptable water supply portfolio to maximize the value of the region's water assets.
3. Drive science-based decision making and proactive risk management.
4. Build trust by being a collaborative and resourceful partner through effective communication and engagement.
5. Attract and support top talent and promote a rewarding culture of growth and opportunity.
6. Commit to effective governance through Board leadership development.

STRATEGIES

SAN BERNARDINO VALLEY
A REGIONAL WATER AGENCY SINCE 1954

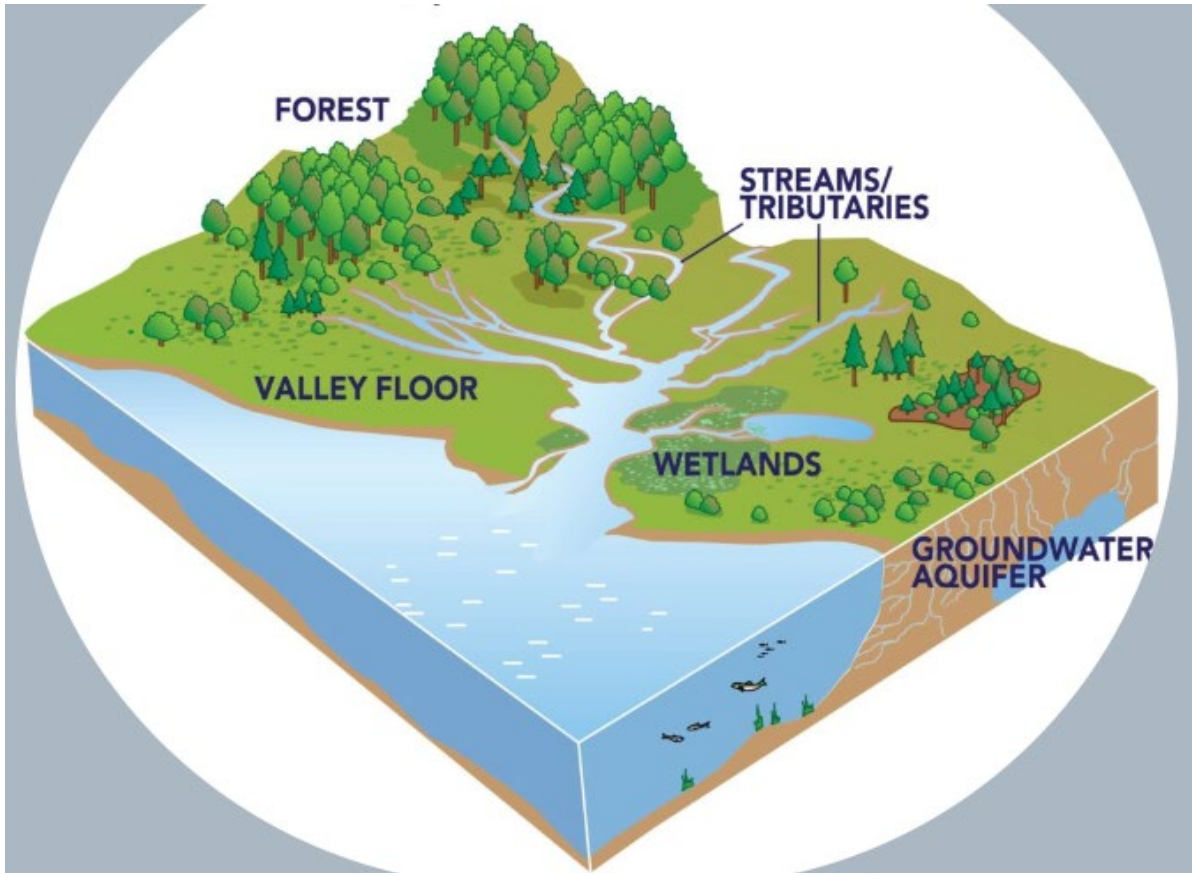
CARP Guiding Principle #1:
Maintain a diverse water supply portfolio



Types of Measures

- Surface Storage – Regional and Local
- Surface Storage – Statewide
- Delta Conveyance and California Aqueduct Resilience
- Precipitation Enhancement
- Groundwater Storage
- Stormwater Capture
- Recycled Water & Desalting
- Conjunctive Use, etc.

CARP Guiding Principle #2:
Protect the water supply portfolio



Types of Measures

- Nature-Based Solutions
- Ecosystem Restoration
- Forest Management
- Land Stewardship and Land Use Planning
- Sediment Management
- Greenhouse Gas Reduction
- Salt and Salinity Management, etc.

CARP Guiding Principle #3:
Improve operational and infrastructural Flexibility

Types of Measures

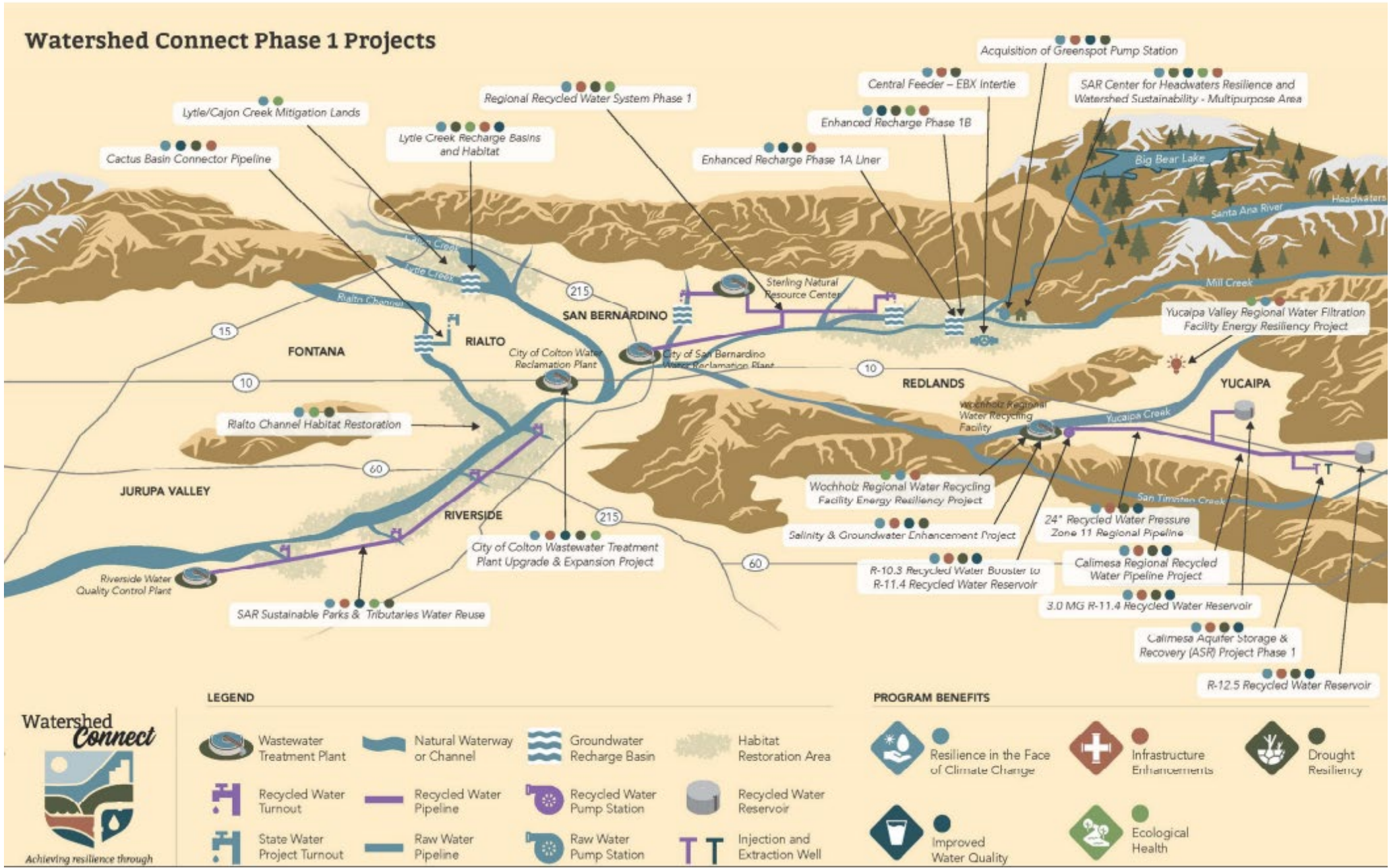
- Operational Flexibility and Redundancies
- Back-up Power
- System Reoperation
- Water Transfers
- Resilient Infrastructure Design
- Operational Contingencies
- Adaptive Water Management

CARP Guiding Principle #4:
Connect Water and People

Types of Measures

- Water-Dependent Recreation
- Cultural and Community Issues
- Reduce water demand through efficiency
- Community climate risks reduction, etc.
- Outreach and engagement

Resilience Partnerships – Watershed Connect



Resilience Partnerships – Headwaters Resiliency Partnership

"We envision this as a big tent approach, where we welcome everyone with ideas on improving the health and ecological function of our forest headwaters to join the Partnership. As we identify solutions and speak with one voice, our message is that stakeholders in the San Bernardino headwaters and the valley cannot rely solely upon outside help to begin addressing these significant challenges. Healthy headwaters are critical to our water supply, habitat function, and the well-being of the communities living near and within the San Bernardino National Forest. We need to start this initiative now and we need to do it together."

Heather Dyer, CEO/General Manager SBVMWD

California Adaptation Forum
Recycled Water Program Overview

August 2, 2023

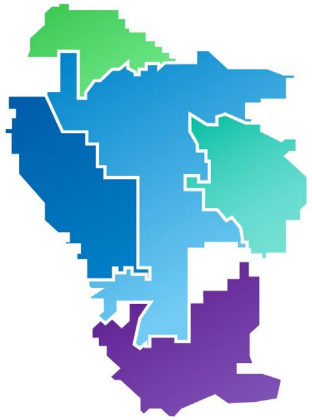
John Wuerth

ESTABLISHED IN

1950

SERVES:

WATER / WASTEWATER / RECYCLED



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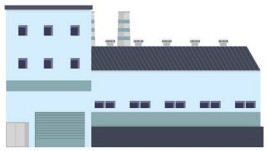
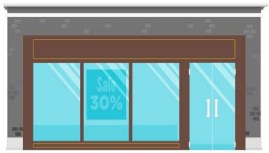
SQUARE MILE SERVICE AREA



WHOLESALE

&

RETAIL



APPROXIMATELY

43%

CURRENTLY BUILT OUT

POPULATION NEARLY:

1,000,000

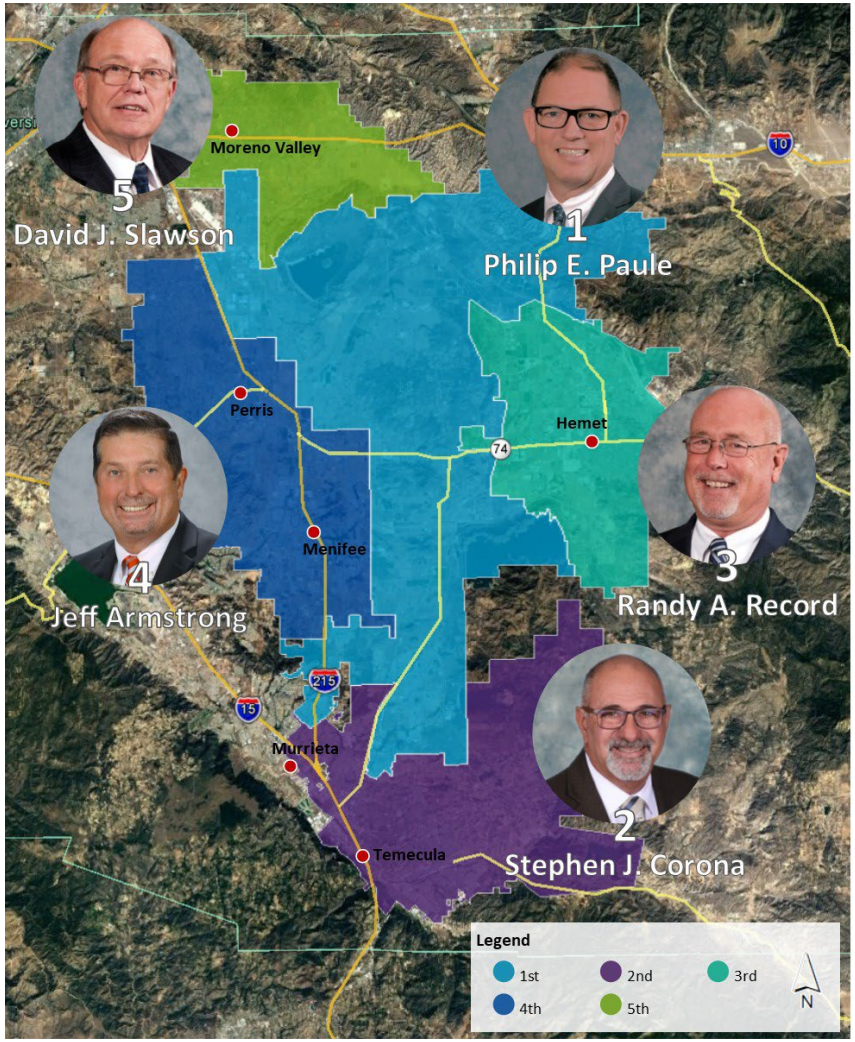
26

member agencies of The Metropolitan Water District of Southern California

ONE OF THE

About EMWD

- Five division publicly-elected Board of Directors
- More than 600 employees
- Annual budget of $557 million for FY 2023-24
- Five-year capital improvement program of $686 million for FY 2023-24 to FY 2027-28
  - $115 million in external funding
  - More than 200 active capital projects
- Sixth largest public water utility in California



EMWD's Service Area

- Moreno Valley to Temecula
- Seven cities and the unincorporated areas
- One of 26 member agencies of The Metropolitan Water District of Southern California (Metropolitan)
- EMWD Representative to Metropolitan:
  - Jeff Armstrong

Core Services

DRINKING WATER

- Approximately 163,000 accounts
  - 92,694 acre feet sold in FYE 2022
  - Imported water from State Water Project and Colorado River Aqueduct
  - Groundwater wells (adjudicated basin)
  - Menifee and Perris brackish desalters

WASTEWATER

- Approximately 268,000 accounts
  - Four operating regional water reclamation facilities
  - 77 million gallons per day capacity
  - 49 millions gallons per day average

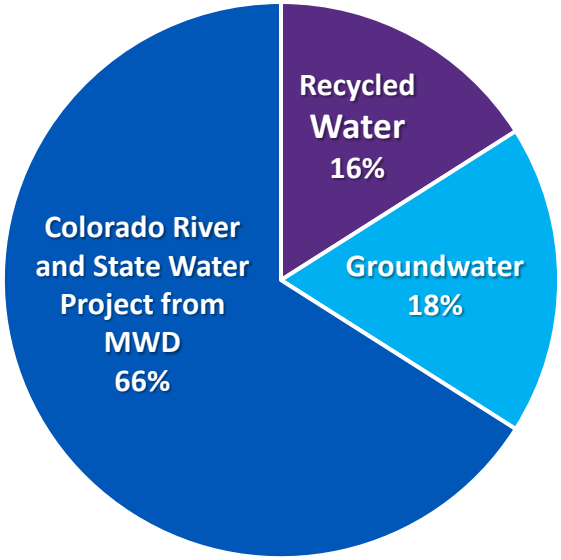
RECYCLED WATER

- Approximately 700 accounts
  - 39,216 acre feet sold in FYE 2022
  - Extensive agricultural irrigation, municipal irrigation, and environmental use

Water Supply Portfolio

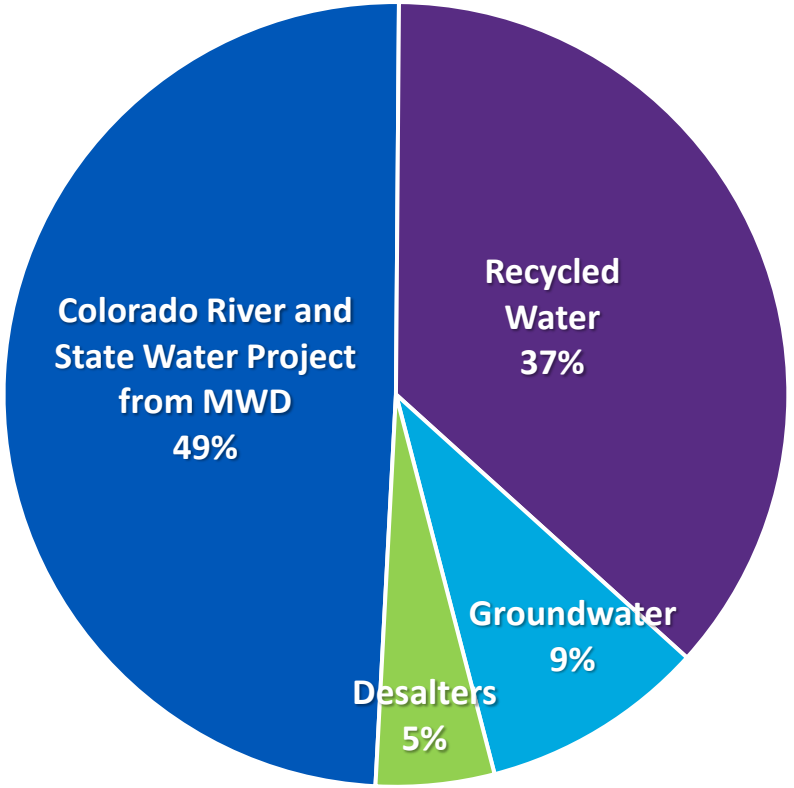
1990

Population served: 358,000



2022*

Population served: 888,268



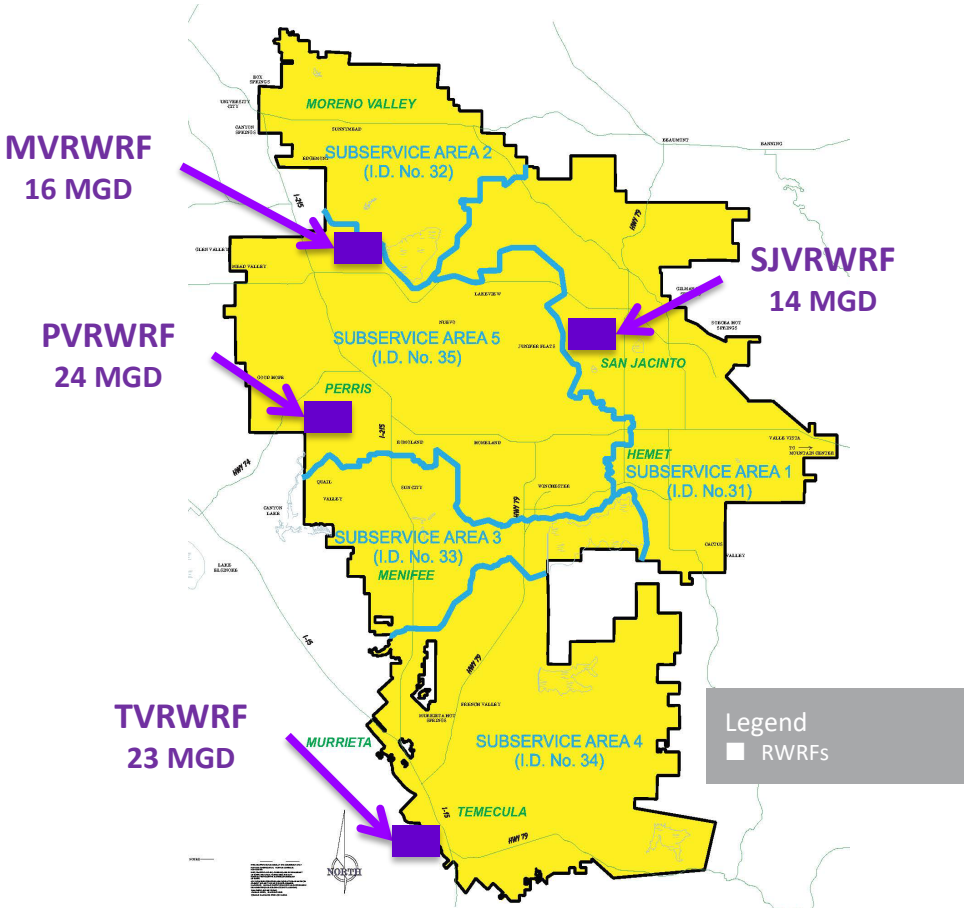
**Total Water Supply: 149,733 AF per EMWD Annual Comprehensive Financial Report, FYE 2022*

Recycled Water Program History

- **1960's:** *Treated effluent disposed through on-site percolation & evaporation ponds*
- **1966:** *Began marketing recycled water for local farmers*
- **1991:** *Received USBOR funding to develop a recycled water backbone transmission system*
- **2003:** *Initial system pressurization*
- **2005:** *Mandatory Use Policy*
- **2008:** *Received USBOR (ARRA) funding to stabilize recycled water system – began construction 2010*

Wastewater Collection and Treatment

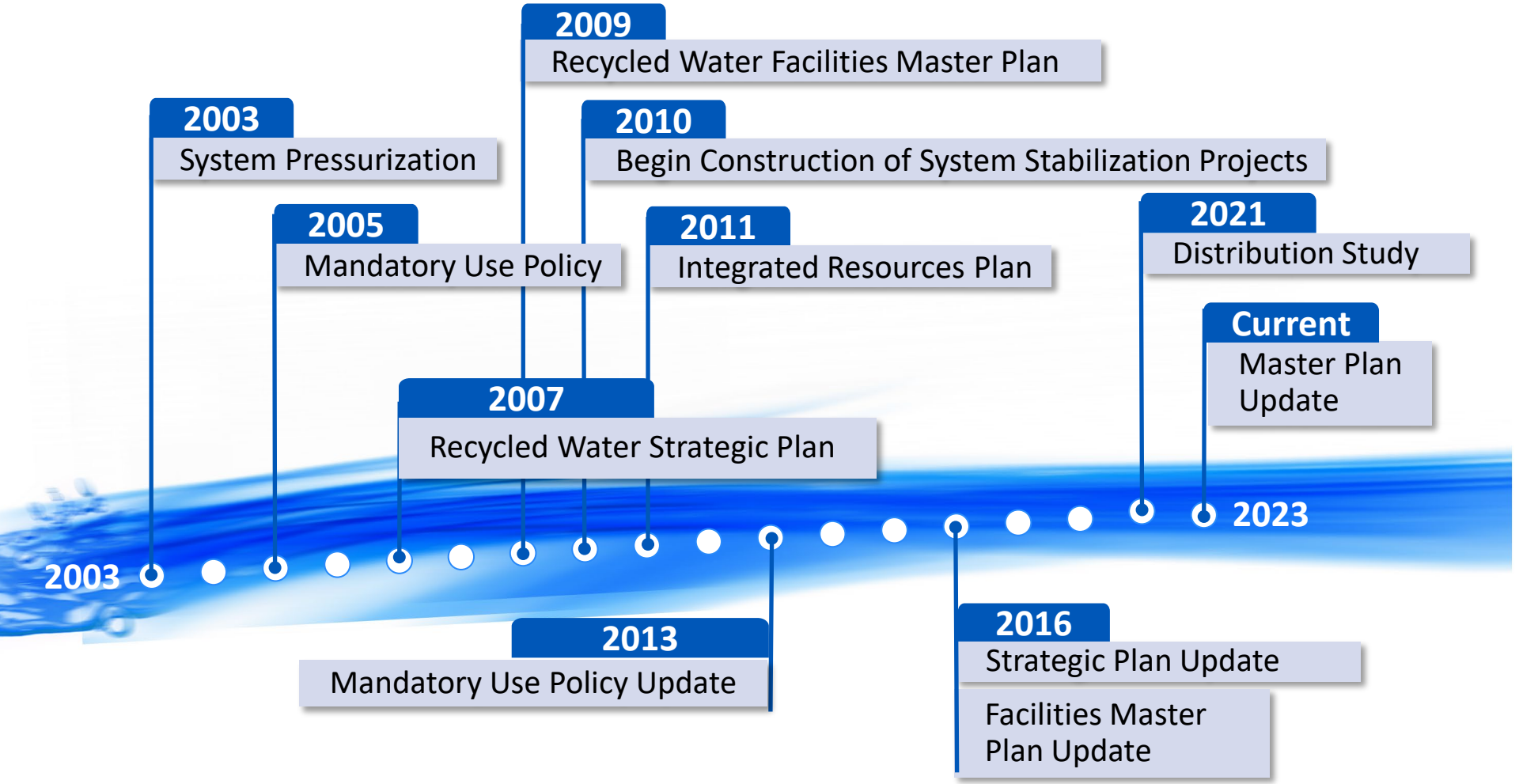
- Four Regional Water Reclamation Facilities (RWRFs)
  - San Jacinto Valley
  - Moreno Valley
  - Temecula Valley
  - Perris Valley
- 77 MGD current permitted operating capacity
- 49 MGD current average flows



All RWRF's produce "tertiary" treated recycled water
Approved for unrestricted uses

Supply is equivalent to filling up a square mile 1' deep every 4 days

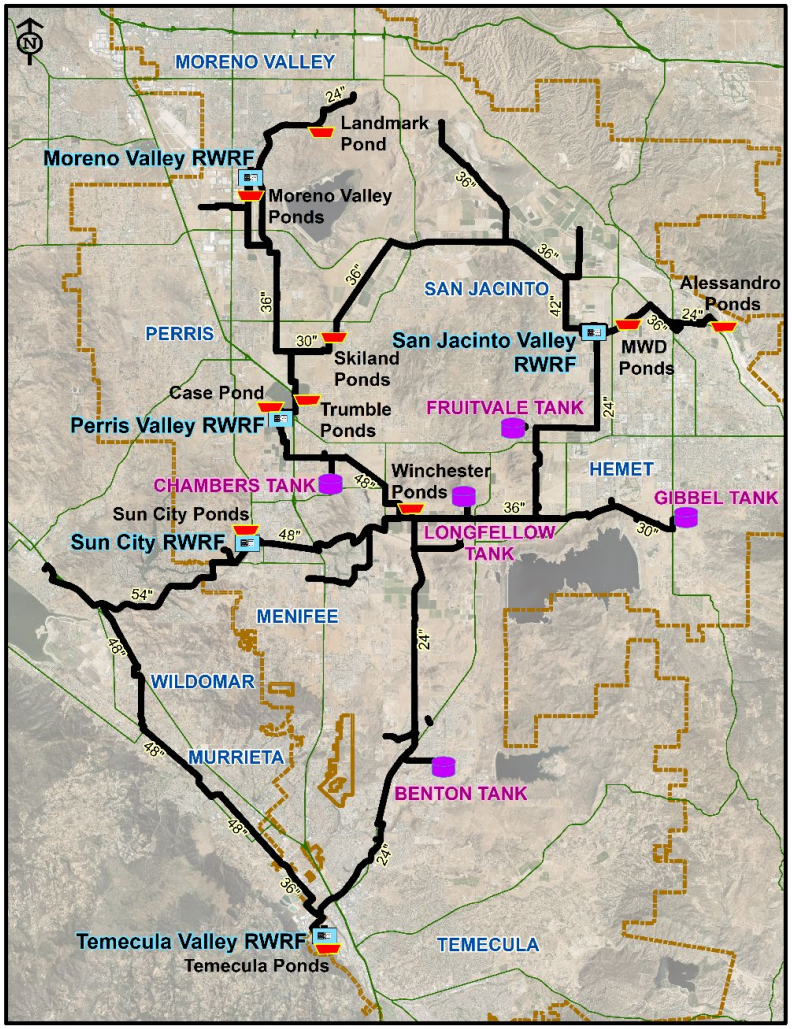
Recent Recycled Water Program Initiatives



Consistent Goal: 100% Beneficial Reuse

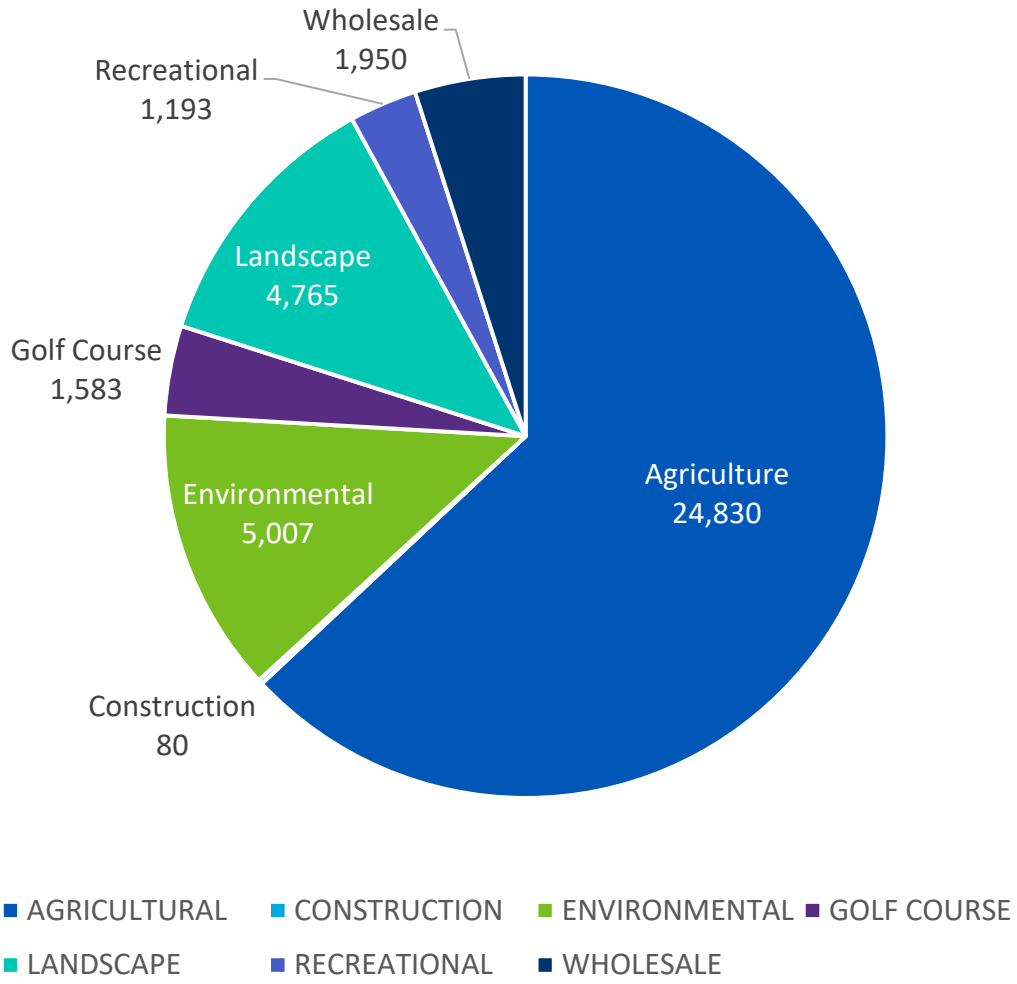
Consistent Approach: Improve system reliability and level of service

The Current EMWD Recycled Water System



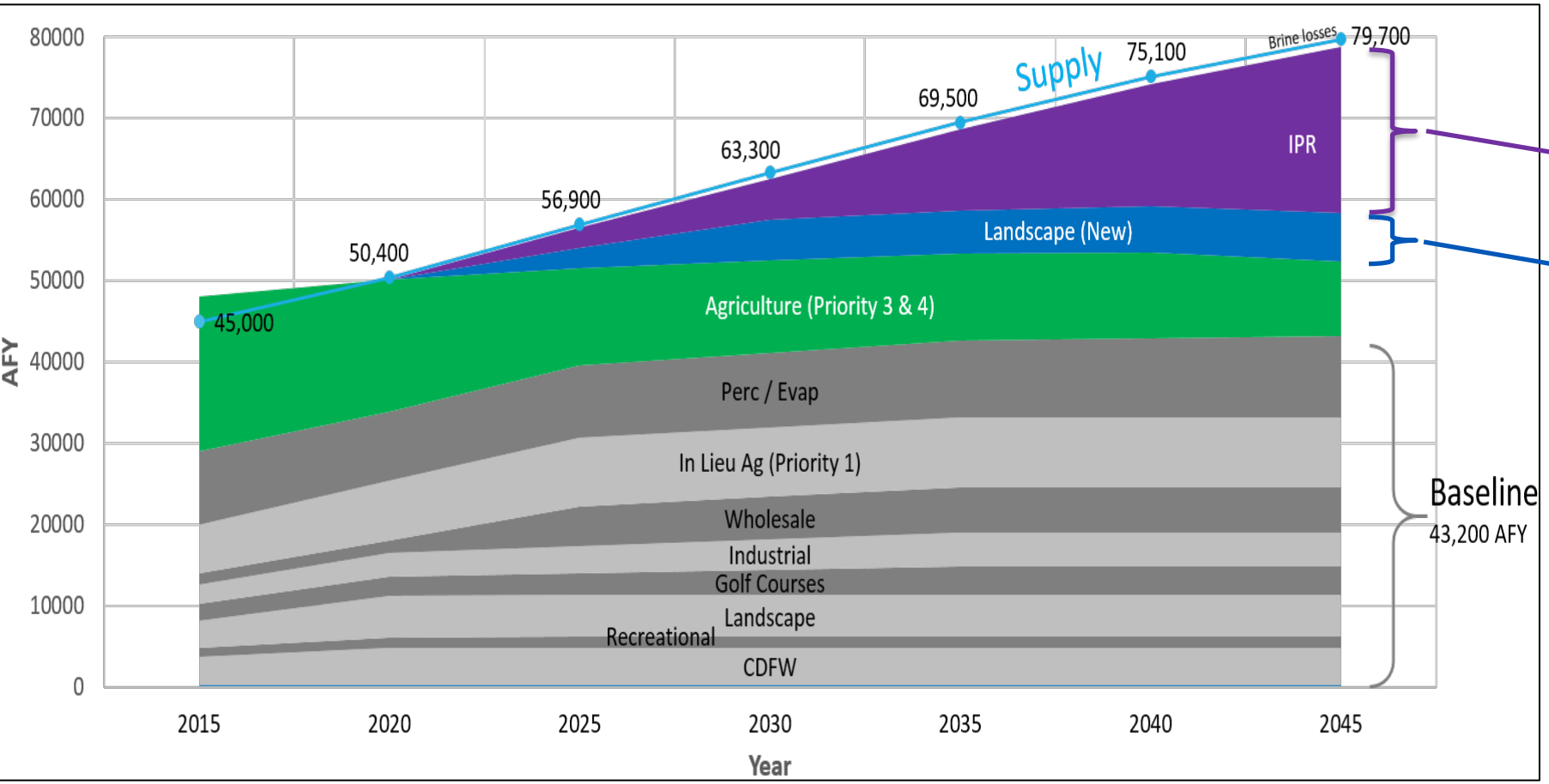
- More than $200M in investments
  - Over $70M in last 13-years
- 263 miles of recycled water pipeline
- Nearly 7,700 AF of seasonal storage
- Four pressure zones consisting of:
  - 19.5 MG of elevated storage
  - 24 active pump facilities

Recycled Water Usage Type FY 2021-22 – Acre Feet



*Per *EMWD Customer Billing Data, FYE 2022*

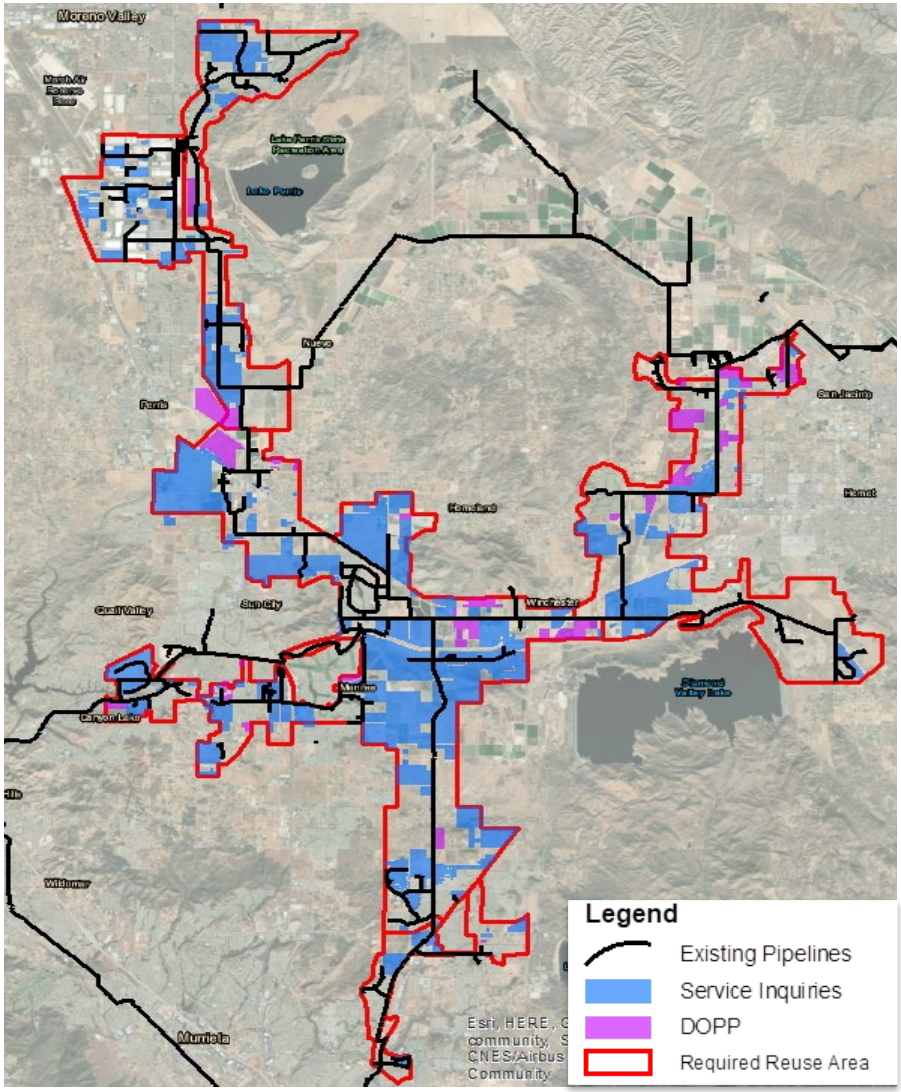
Future Recycled Water Demand Projections

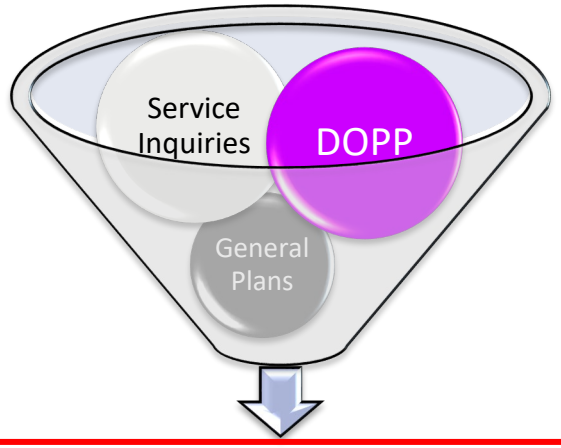


New Landscape Demands – 8,000 AF

Indirect Potable Reuse – 20,000 AF

“Mandatory Use” for new Development





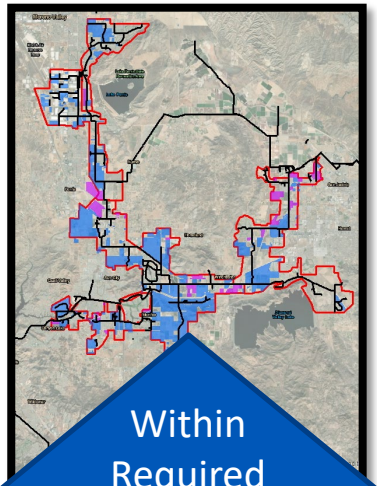
Required Reuse Area (RRA)

- Essentially a Mandatory Use zone
- Creates a concentrated and contiguous reuse area
- Clearly communicates expectations to developers
- Can be reviewed and updated as development evolves

Goal: efficient distribution of RW for landscape irrigation

- Highest level of service
- Minimal distribution system costs

Recycled Water Service Conditioning



Developer identifies parcel(s) for development

Within Required Reuse Area

Yes

Common Landscape Areas

Yes

Candidate

Initiate Recycled Water Service Process

No

Not a Candidate

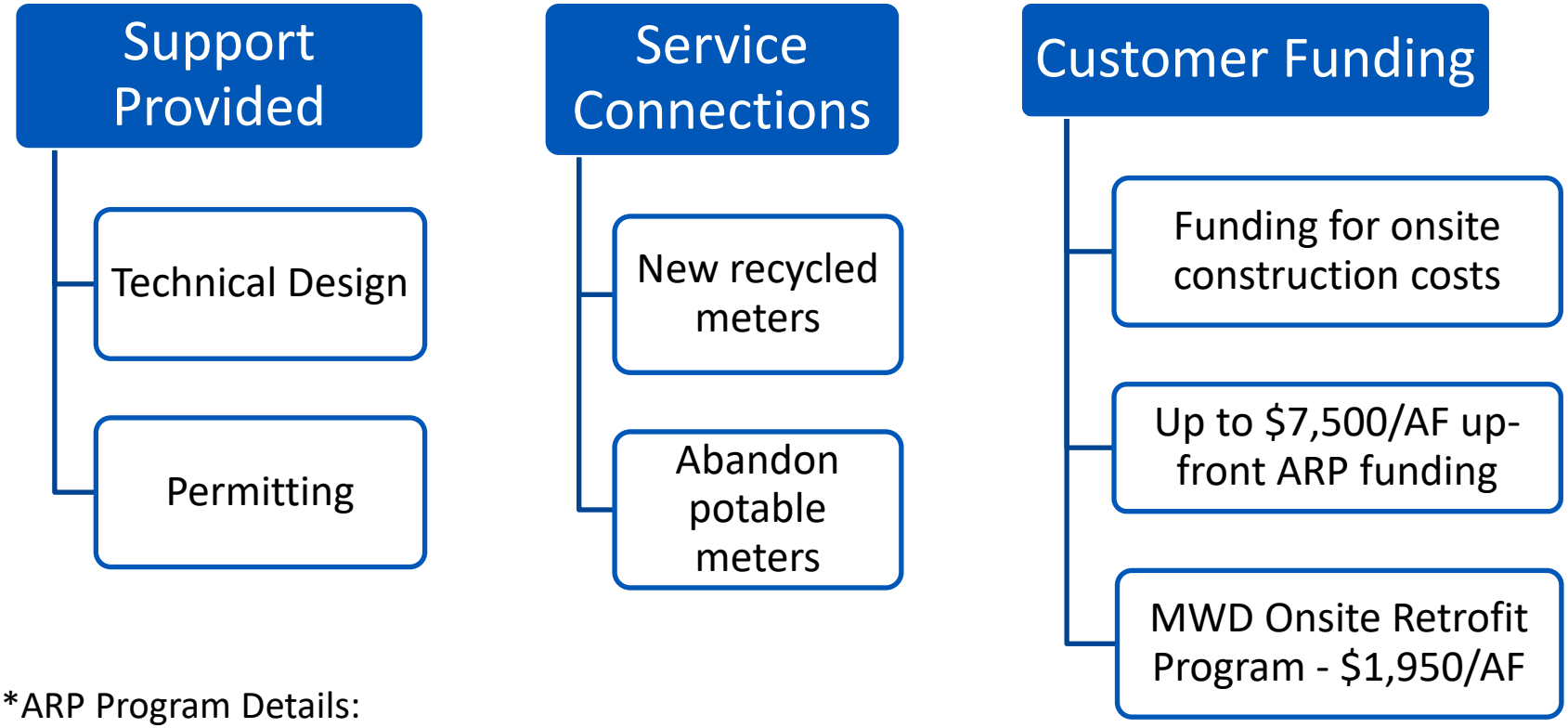
No

Not a Candidate

Codified in Administrative Code and fully implemented

Accelerated Retrofit Program (ARP)

In response to the 2015 SWRCB conservation mandate, ARP was developed to advance retrofit projects to achieve PW offsets

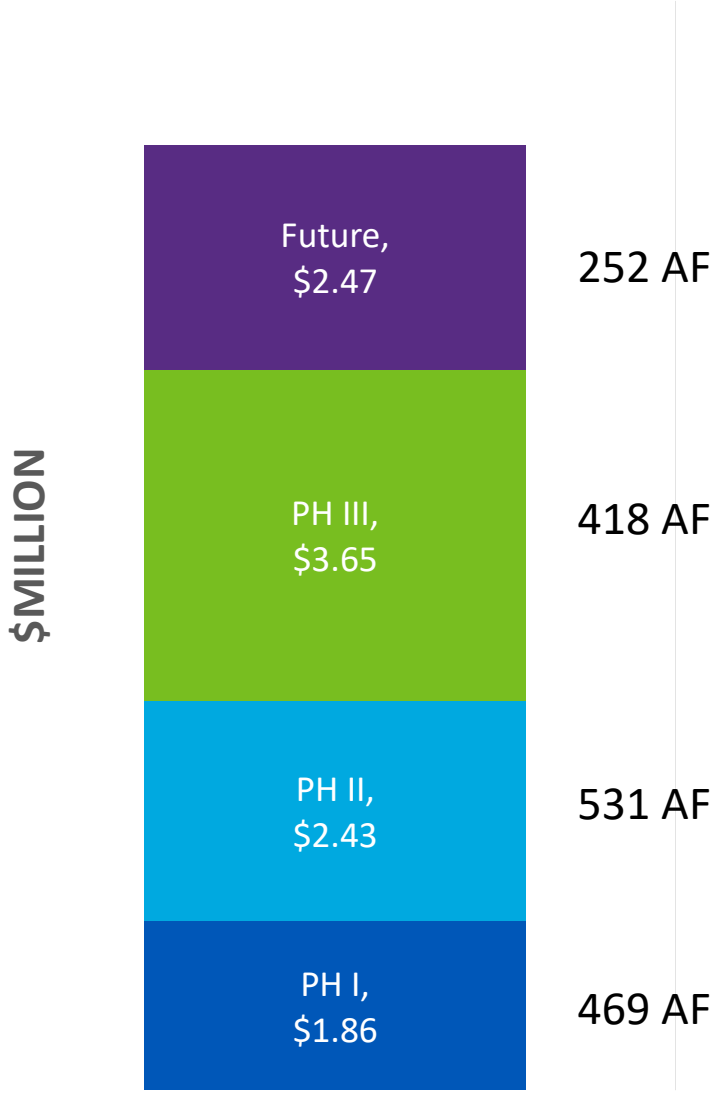


*ARP Program Details:

- Customers pays ARP Rate at 75% of potable rate
- After 10-years, customer reverts to then-applicable recycled water rate

ARP Results to Date

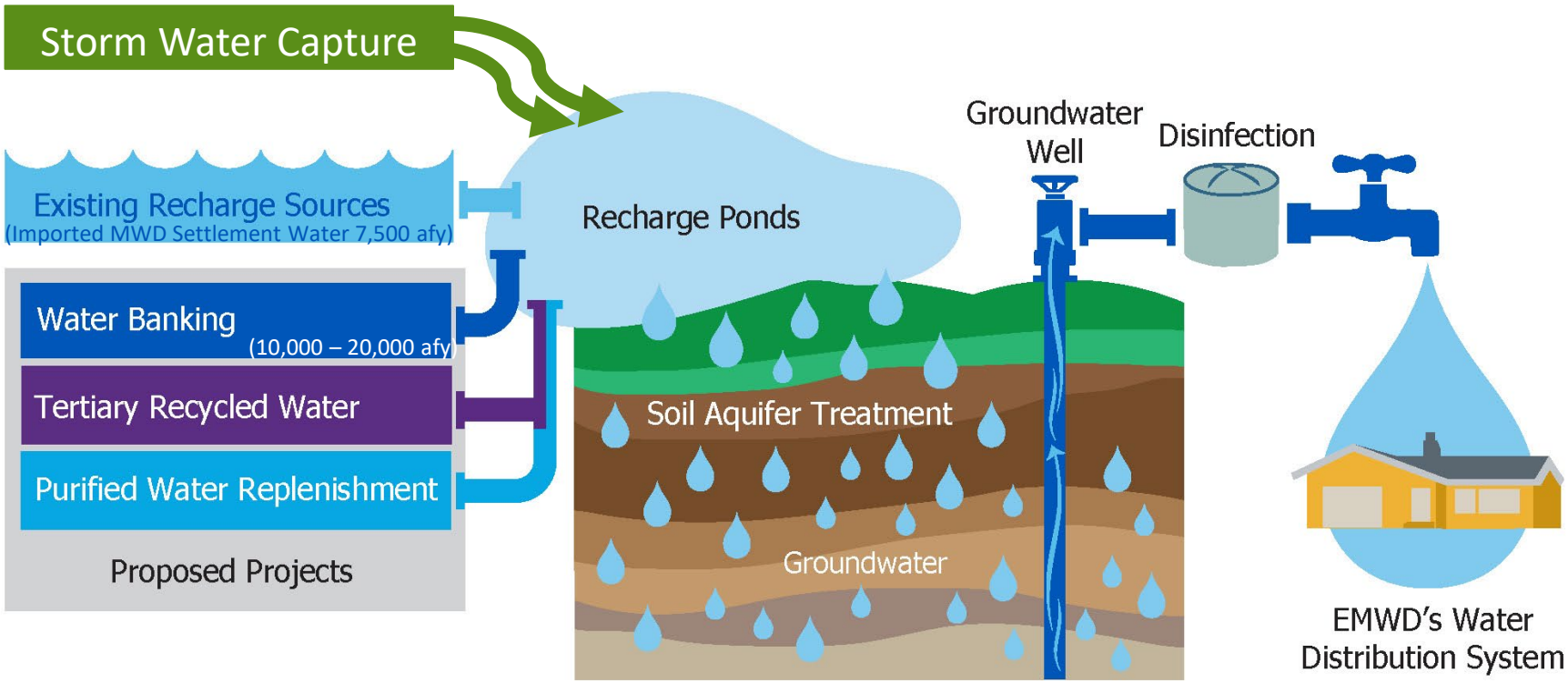
- ARP Totals
  - 1,417 AF PW offset
  - 825,000 SF Turf transformation
  - Total cost - $7.9M
  - $5,604.45 per AF
- Future ARP projects
  - 252 AF on radar – more as system expands
- Benefits:
  - Long term potable water offset
  - Supports acceptance of recycled water use
  - Maintains recreational areas for our community
  - Enhances customer partnerships
  - Maintains revenue stream through recycled water sales



Recycled Water Future

GROUNDWATER RELIABILITY PLUS
Securing Our Water Future

- Purified Water Replenishment (PWR) aka Indirect Potable Reuse
  - Part of EMWD's Groundwater Reliability Plus initiative
  - Advanced treatment plant proposed to be constructed on EMWD property north of the San Jacinto Valley Regional Water Reclamation Facility
  - Purified recycled water will be blended with tertiary treated recycled water and pumped to the replenishment basin in San Jacinto



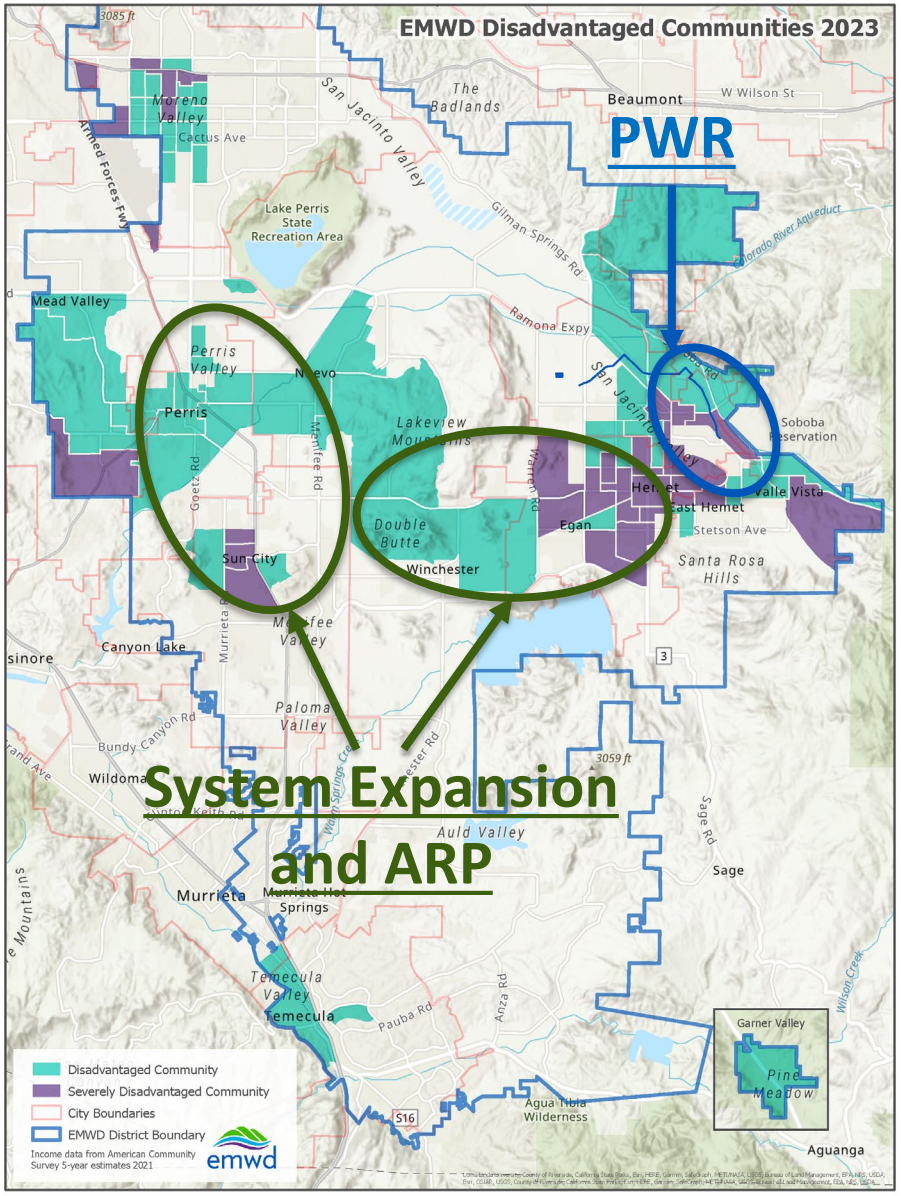
Supporting our Communities with Recycled Water

Dedicated supply for common area landscape

- Keeps our public recreational areas green even during times of drought
- Lower cost of water for landscaping – parks and schools
  - Lower overall cost to community

Maximizes EMWD's reliable locally produced supply

- Reduces need to import more expensive water
- Lowering cost of service for all



Recycled Water Take-Aways

- Key part of water supply solution
  - Right water for the right use
- Balanced demand portfolio is optimal to maximize beneficial use
  - Agriculture
  - Common area landscape
  - Environmental
  - PWR
- Opportunities for coordination w/ land use agencies
  - "Appropriate" landscape planning, conditioning & design
  - Develop, integrate and promote the **"water use efficiency lens"**

emwd

John Wuerth
Water Resources Planning Manager
(951) 928-3777 Ext. 4334
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WESTERN WATER

Powered by water.
Driven by service.

Resiliency through Conjunctive Use and Partnerships

August 2, 2023

Joshua Aguilar
Deputy Director of Water Resources

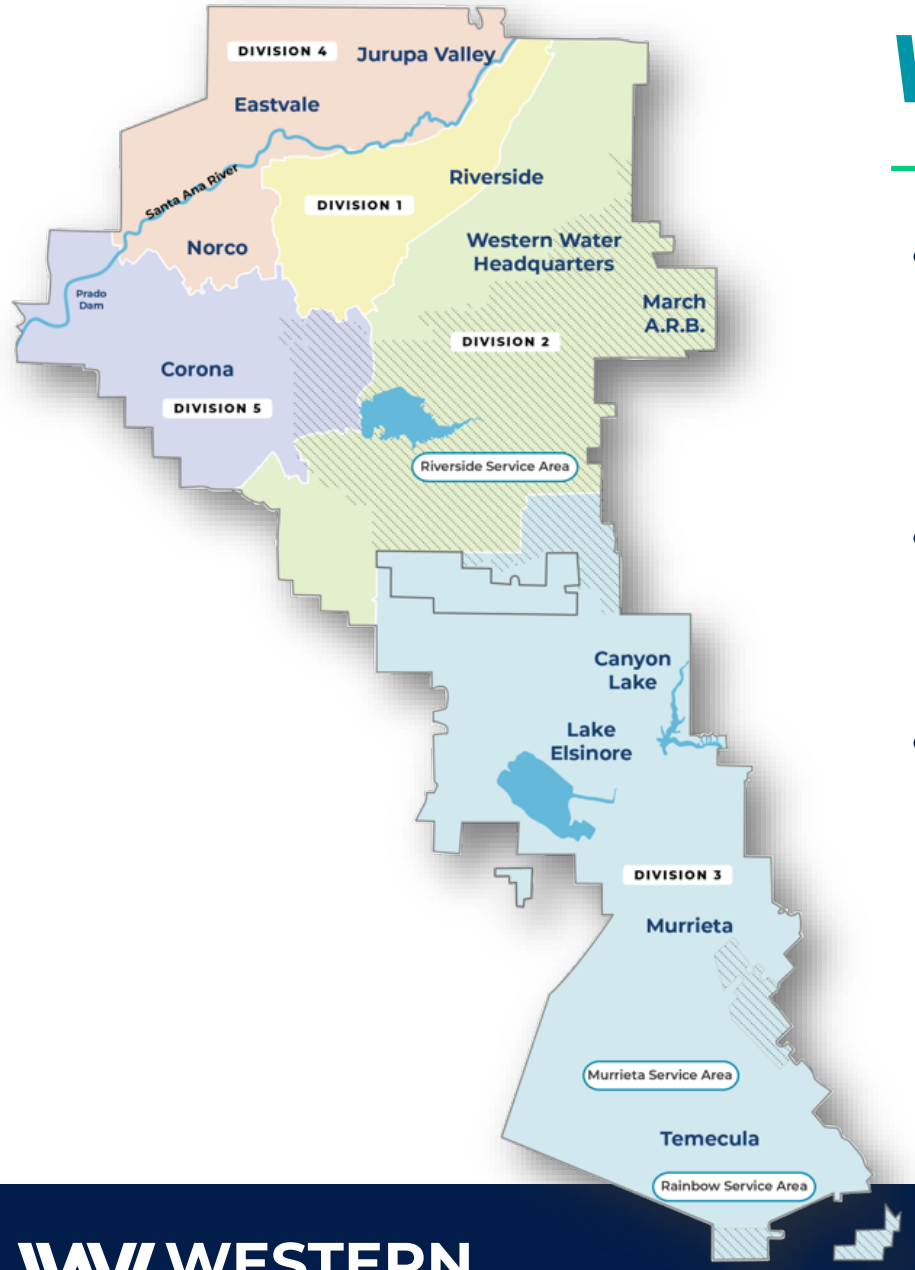
About Western Water

1. Providing drinking water, recycled water, and wastewater services to nearly 1 million people

2. Serve fourteen (14) wholesale customers

3. Serving nearly 25,000 direct connections (100,000+ people)

4. Member agency of the Metropolitan Water District of Southern California

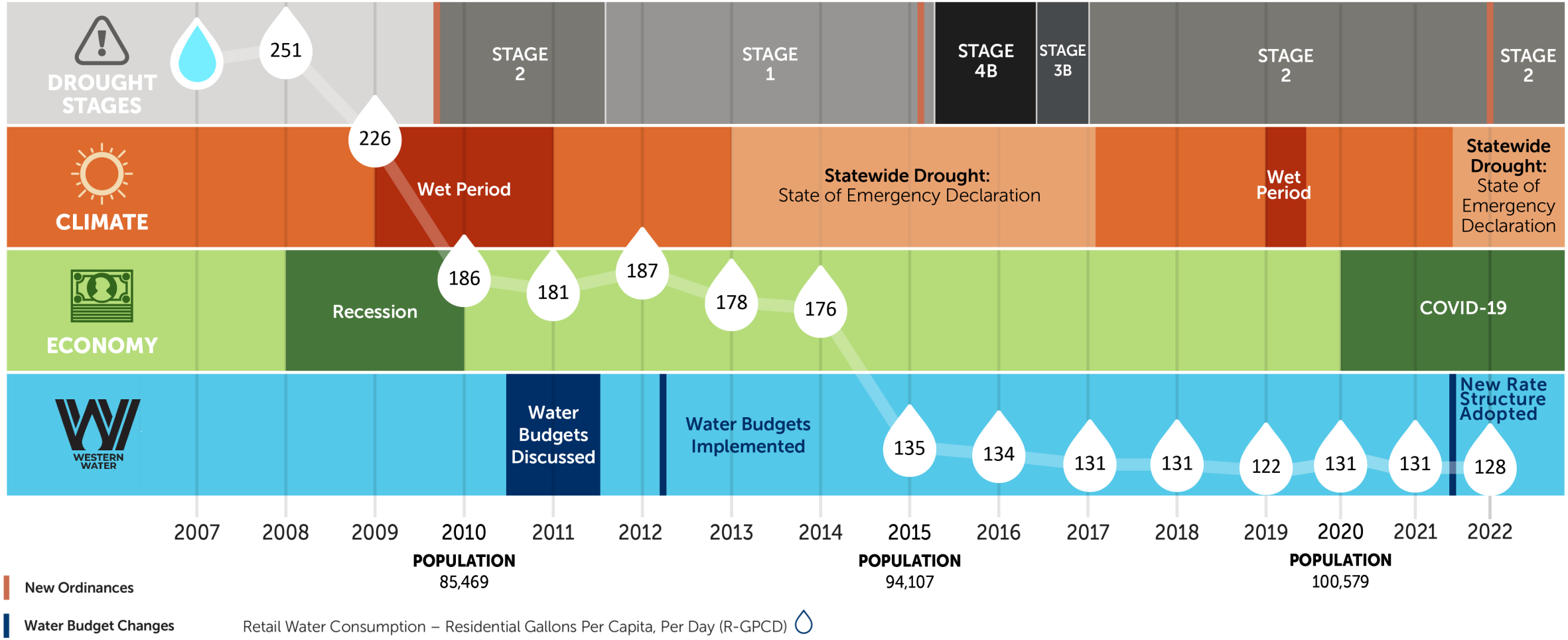


Western Water's service area

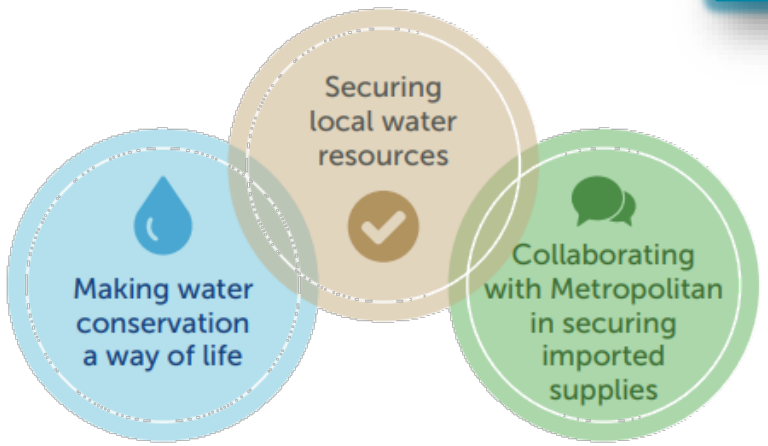
- **Established in 1954 to deliver imported water**
  - 527-square-mile service area
- **Located in western Riverside County**
  - 60,000 to 85,000 acre-feet of water served annually
- **Our Western Water Portfolio**
  - 38% local supply + 62% imported water

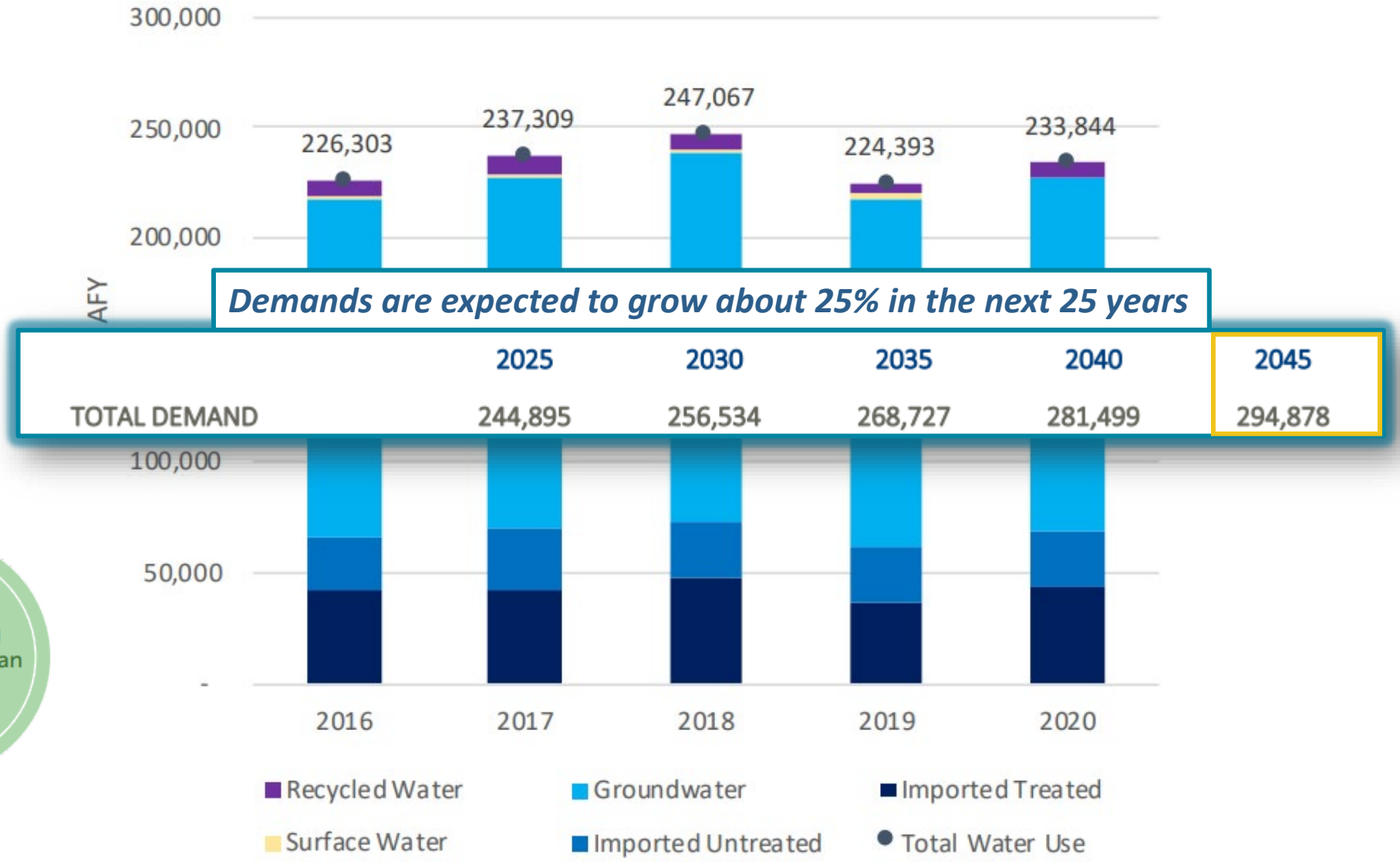
**An acre-foot of water is enough to flood a football field 1-foot deep*

WESTERN WATER'S RETAIL WATER USE



WATER DEMANDS



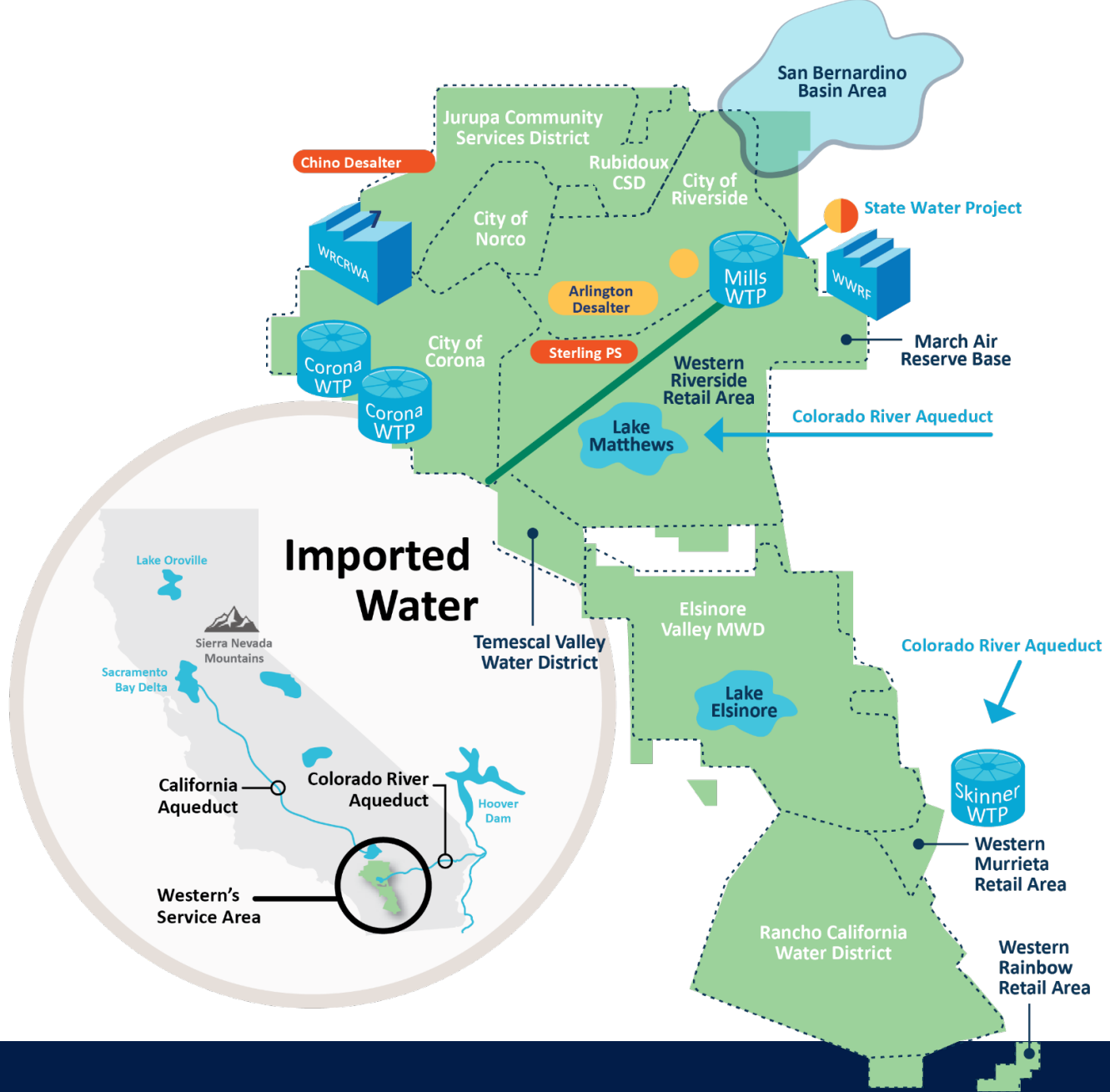


Demands are expected to grow about 25% in the next 25 years

	2025	2030	2035	2040	2045
TOTAL DEMAND	244,895	256,534	268,727	281,499	294,878

WATER RESILIENCY

- ✓ Groundwater Recharge
- ✓ Groundwater Desalters
- ✓ Conveyance & Interties
- ✓ Recycled Water
- ✓ Imported Water
- ✓ Partnerships



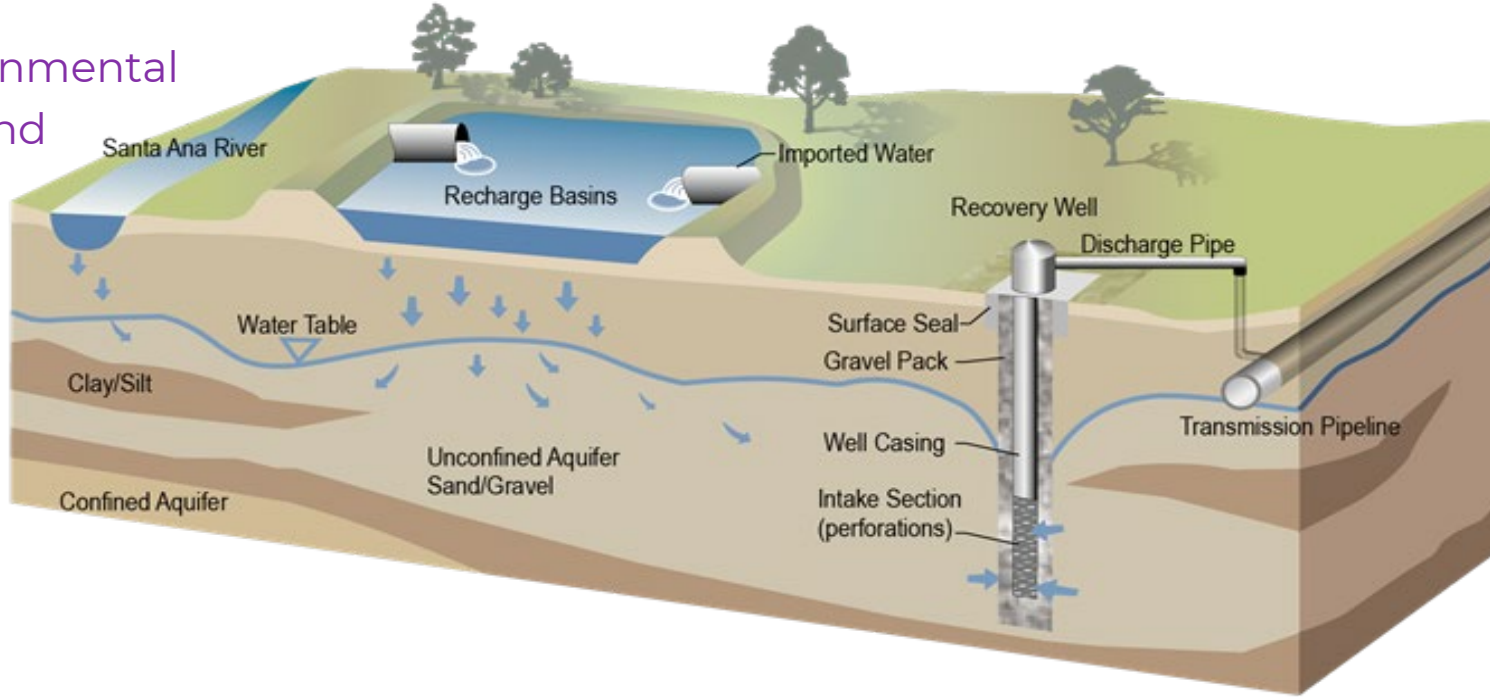
GROUNDWATER RECHARGE

Santa Ana River Enhanced Recharge Phase 1B

✓ **Securing water supplies**

- Expands existing groundwater recharge facilities to capture and recharge local stormwater
- Ensures water supply reliability and environmental sustainability for current and future demand
- Secures up to 80,000 acre-feet/yr of water

✓ **Exemplifies success in partnerships**



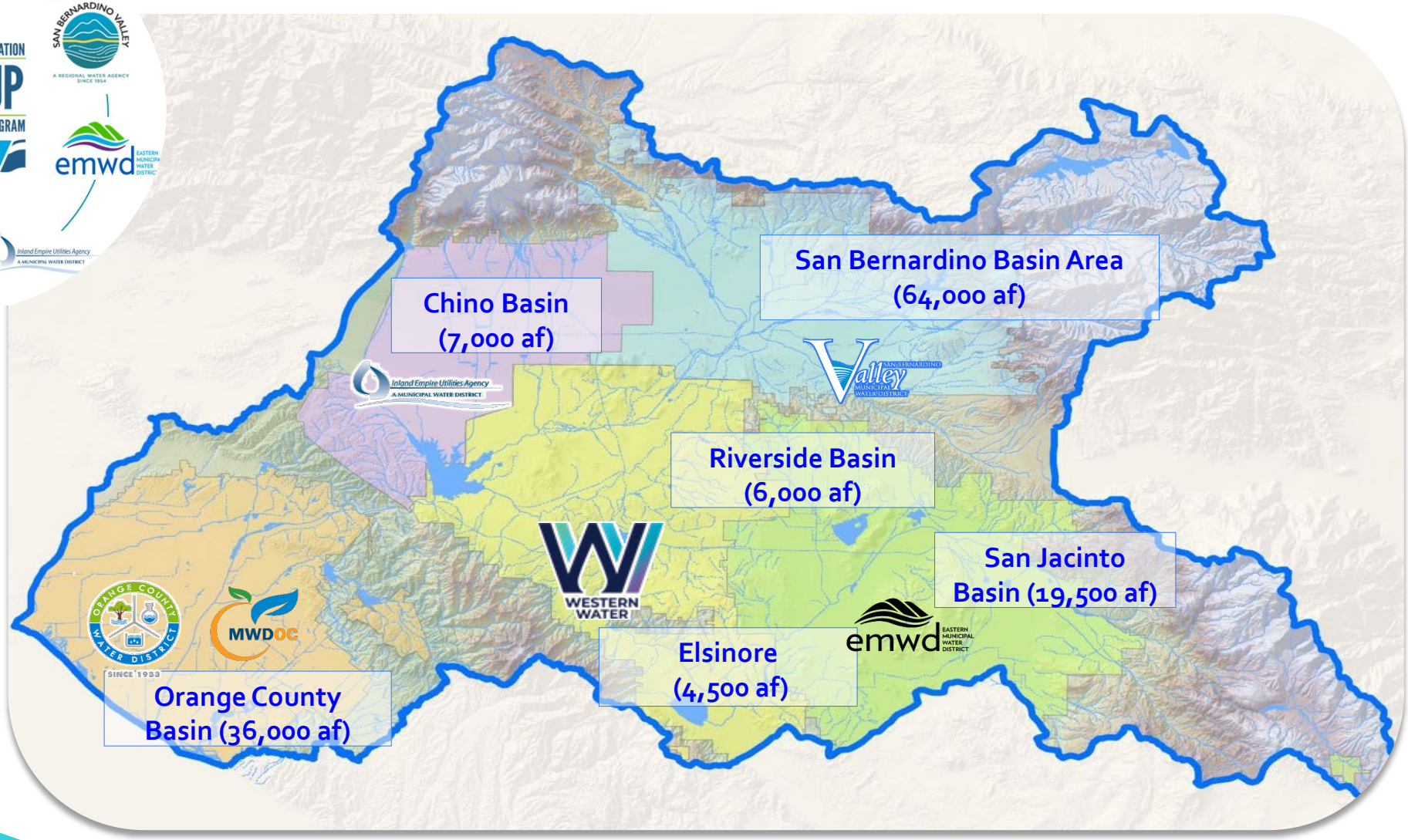
San Bernardino Valley Water Conservation District

FORECAST INFORMED RESERVOIR OPERATIONS

✓ **Data informed water management strategy**

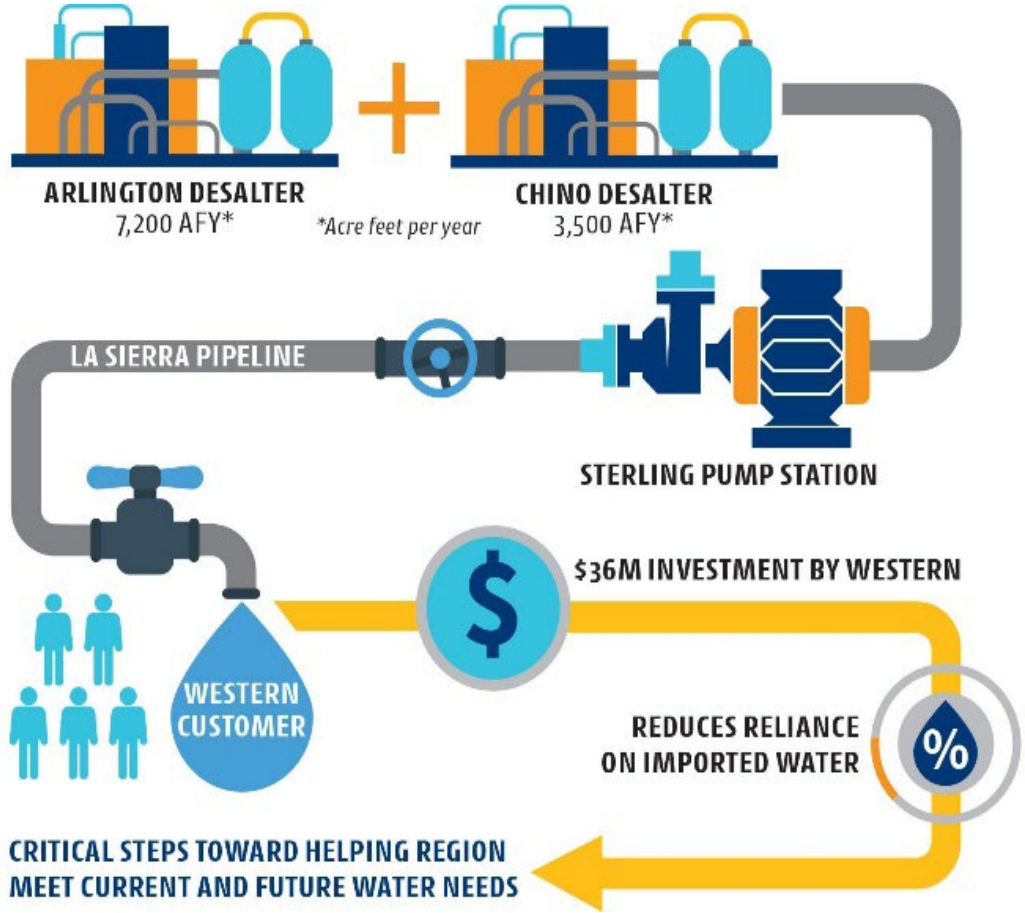
- Use climate forecasted conditions
- Selectively retain or release water
- Link between research, applications, technology, reservoir operations, and water control manuals
- Operations on continuous improvement based on state-of-the-science
- Optimize flood control and groundwater recharge

REGIONAL WATERBANKING



WHOLESALE ENTERPRISE

- ✓ **Infrastructure Investments & Collaboration**
  - Chino Desalter Expansion, Sterling Pump Station, La Sierra Pipeline, and Victoria Recharge Basin
  - Supported by grant funding
- ✓ **Local Supply Reliability and Resiliency**
  - Chino Desalter Expansion adds local supplies
- ✓ **Opportunity to Optimize Supplies**
  - Serves retail customers and wholesale agencies
  - Interconnected systems with added flexibility



Jurupa Community Services District · City of Norco Horsetown USA · Corona The Circle City

Thank you!

Joshua Aguilar
Deputy Director of Water Resources
JAguilar1@wmwd.com

WESTERN WATER

CBP

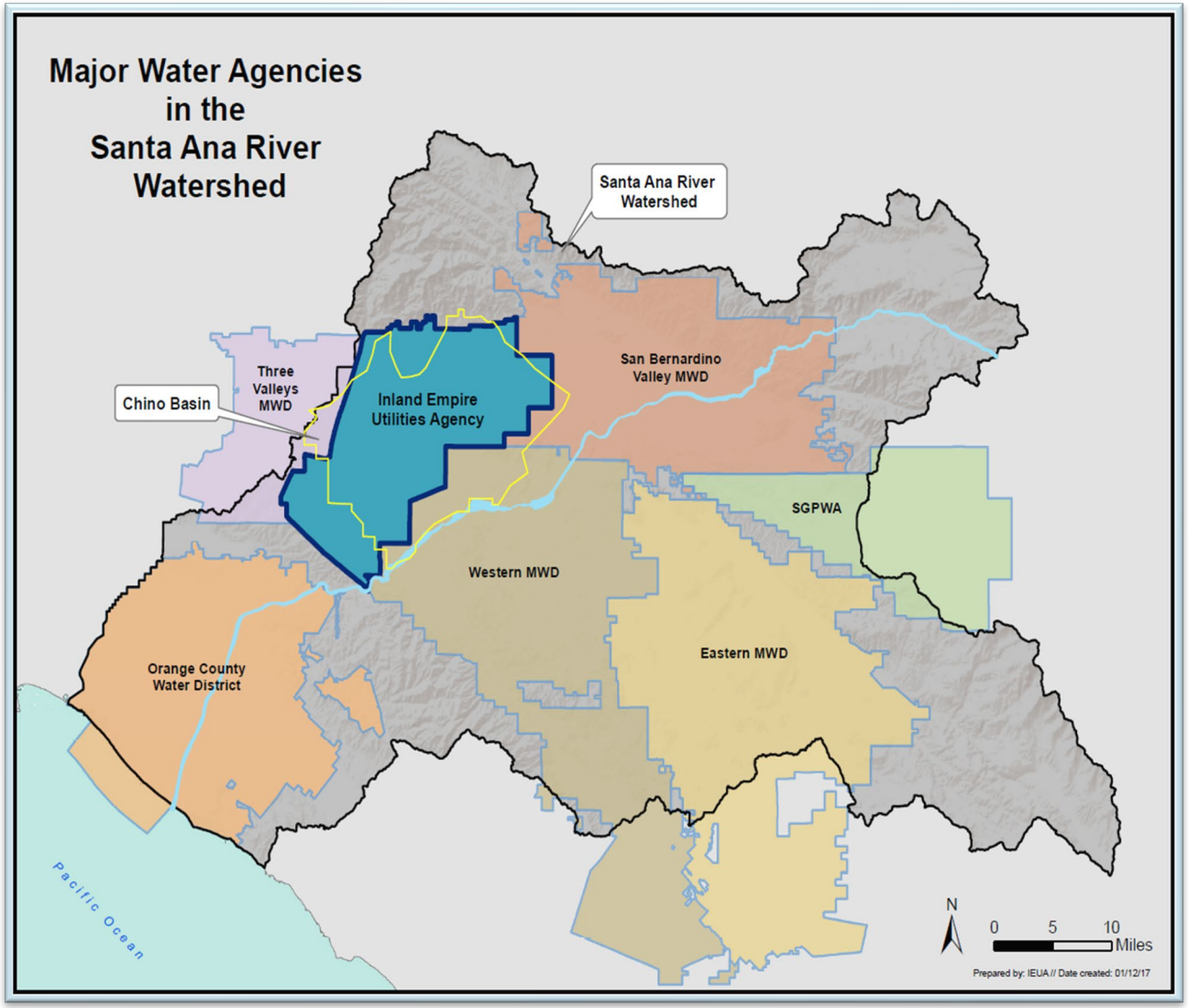
CHINO BASIN PROGRAM

California Adaptation Forum Presentation

Pomona, CA
August 2, 2023

About IEUA…

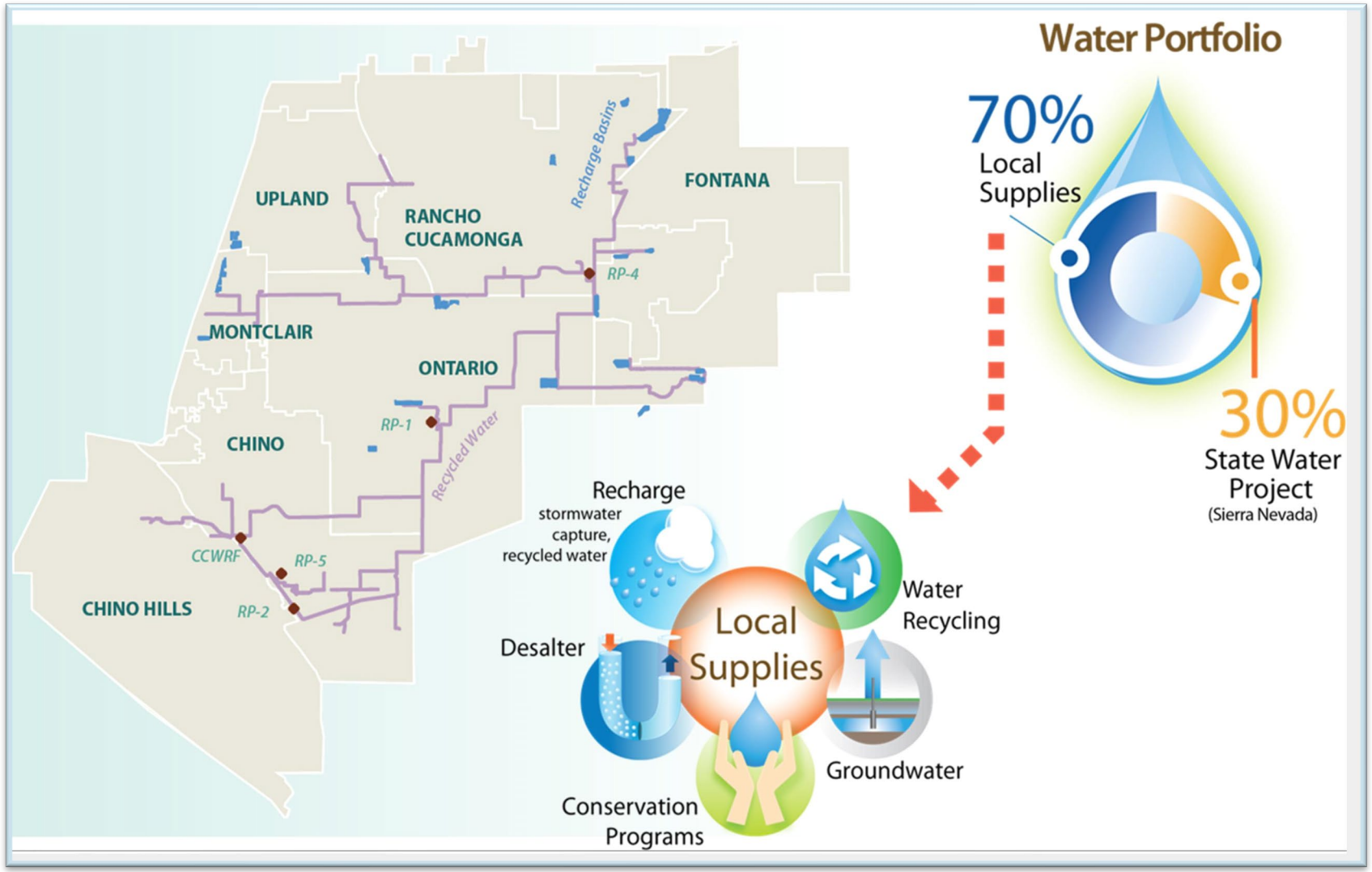
- Located in the southwestern portion of San Bernardino County
- 935,000 residents in our service area
- 242 – square miles
- Overlies the Chino Groundwater Basin
- Water and wastewater agencies:
  - City of Chino
  - City of Chino Hills
  - Cucamonga Valley Water District
  - City of Fontana
  - City of Montclair
  - City of Ontario
  - City of Upland
  - Fontana Water Co.
  - Monte Vista Water District



Water and Wastewater Operations

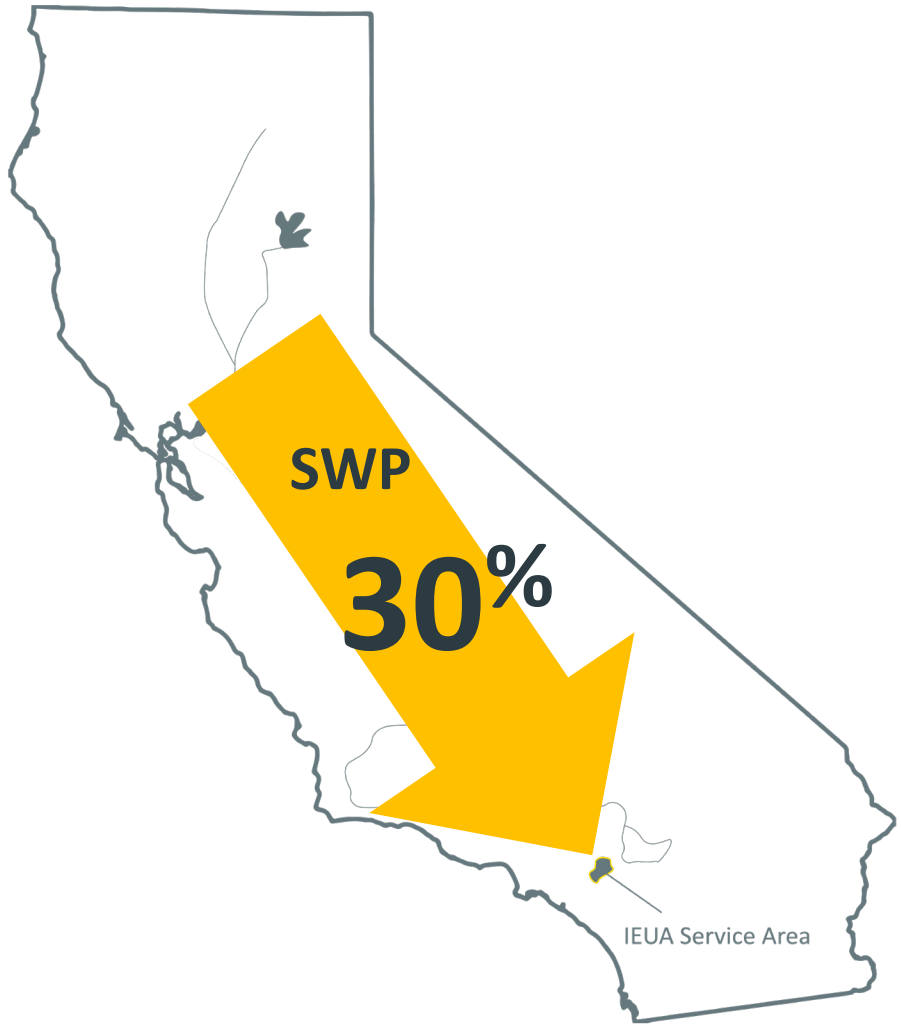
- Wholesale Imported & Recycled Water
  - Delivers 32,000 acre-feet (AF) of recycled water
  - Delivers more than 60,000 AF of imported water
- Wastewater Treatment
  - Four wastewater treatment facilities
  - Approximately 53 million gallons of water per day (MGD) is received for treatment

Regional Water Portfolio



Current Conditions in the Chino Basin

- The Chino Basin is one of the largest groundwater basins in Southern California
- Today, the Chino Basin relies upon imported water from the State Water Project (SWP) **for 30% or more of its water supplies**
- Sometimes, drought restrictions limit the amount of water available from the SWP
- What will we rely on when water imports are limited?



Current Conditions in the Chino Basin

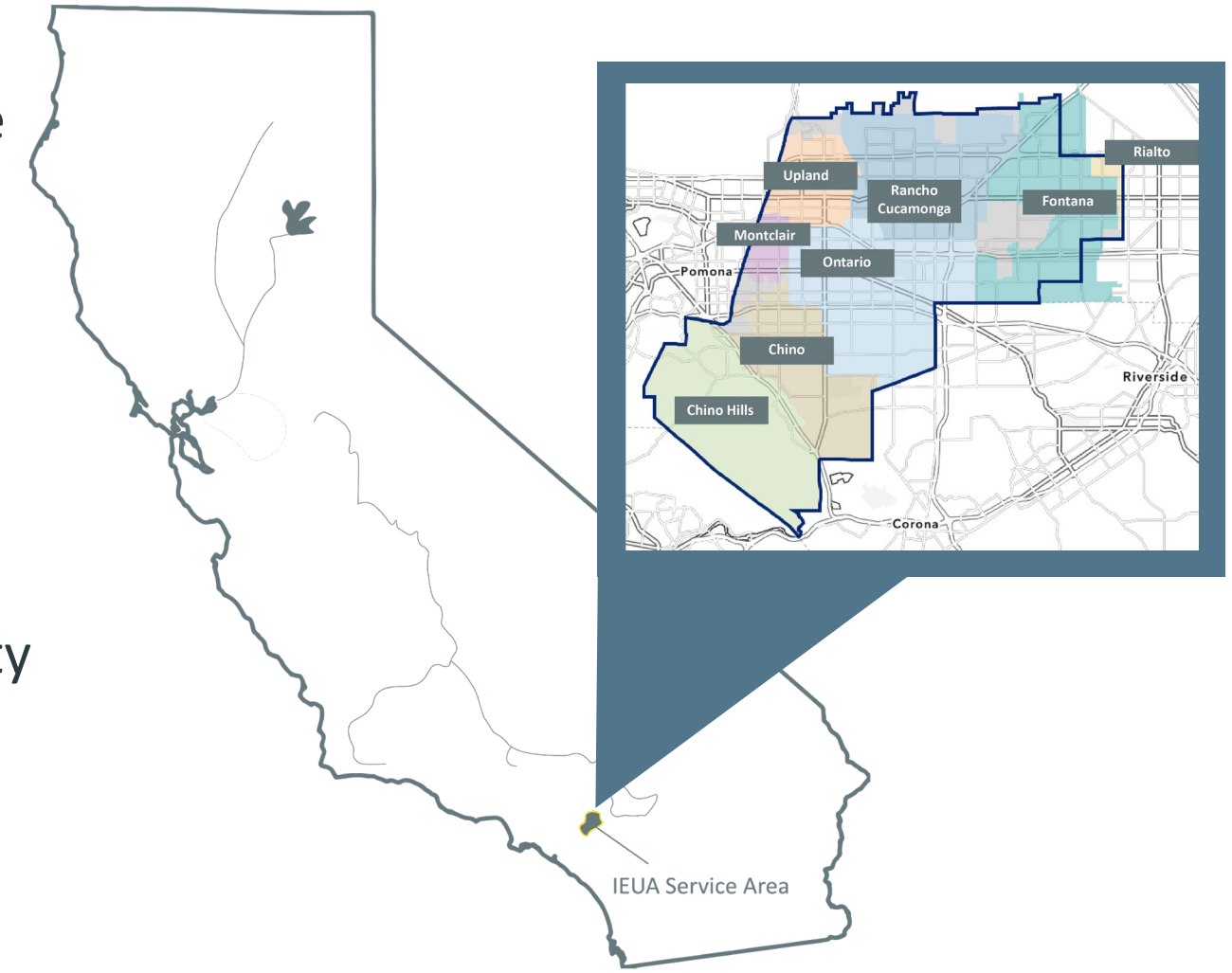
- Local customer agencies also rely on groundwater and **recycled water** to serve their communities

Customer Agency	Current Reliance on Imported Water	Current Ability to Use/Access Recycled Water Allocation
Chino	22%	91%
Chino Hills	10%	62%
Cucamonga Valley Water District	69%	38%
Fontana	35%	33%
Montclair	36%	42%
Ontario	14%	96%
Upland	23%	44%

One solution that will help with local reliability: Chino Basin Program

Chino Basin Program (CBP) adds infrastructure so we can treat and store more water locally:

- CBP is a series of innovative water treatment and storage projects
- Designed to modernize storage and delivery systems of regional water supplies
- Improves local water supply reliability



CBP Infrastructure Components

Infrastructure Components

Recycled Water Supply External

A. Rialto Recycled Water Pump Station

B. Rialto Recycled Water Pipeline

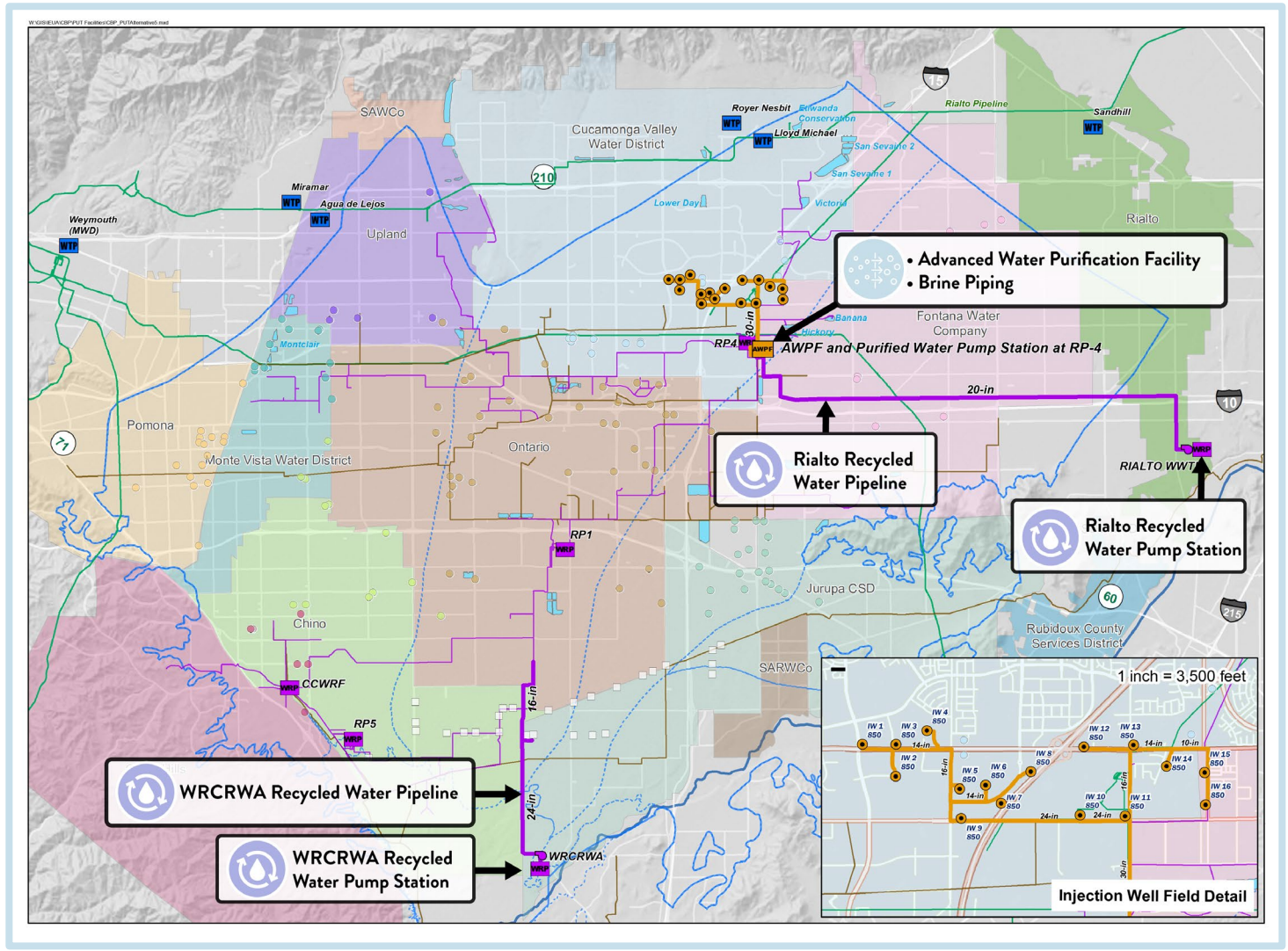
C. WRCRWA Recycled Water Pump Station

D. WRCRWA Recycled Water Pipeline

Advanced Water Purification Facility

A. AWPF

B. Brine Piping



Improvement: Advanced Purification

- Construction of an Advanced Water Purification Facility at IEUA's existing Regional Water Plant No. 4 in Rancho Cucamonga
- Creates 375,000 acre feet (AF) of new, advanced purified recycled water over a 25-year period
- Advanced Purification creates the opportunity to transform recycled water into drinking water quickly and safely

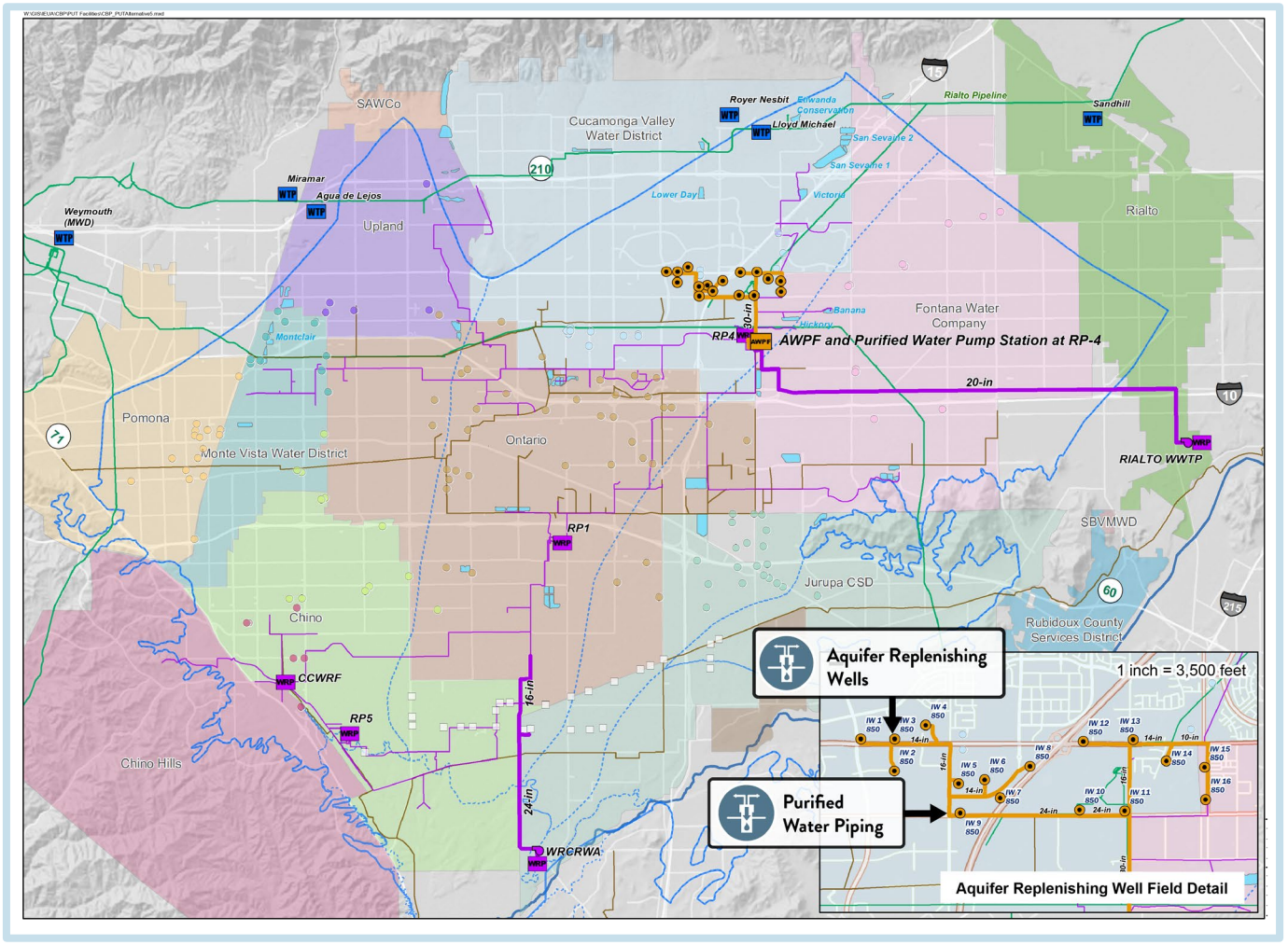
IEUA's Regional Water Recycling Plant No. 4 in Rancho Cucamonga.

Infrastructure Components

Aquifer Replenishing Wells

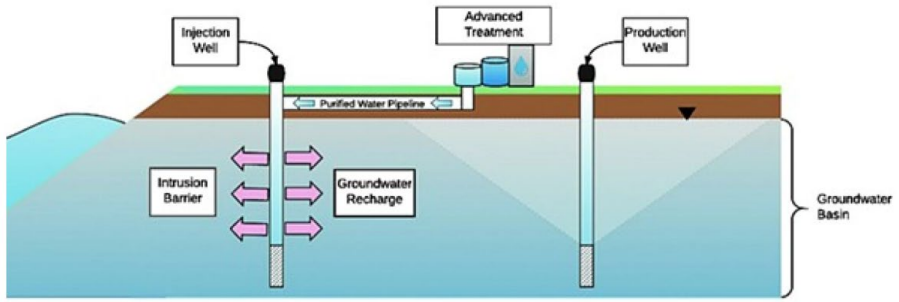
A. Purified Water Piping

B. Aquifer Replenishing Wells



Improvement: Aquifer Replenishing Wells

- Storage is major challenge in our current water supply crisis
  - We are effectively maximizing our groundwater basin recharge today – so what happens when we develop 15,000 AF of new water each year through the Chino Basin Program?
  - We develop new recharge capacity through Aquifer Replenishing Wells
  - An Aquifer Replenishing Well is used to place purified water underground into porous geologic formations



The City Of Pismo Beach /

Aquifer Replenishing Well

Storage Capacity Increases

Infrastructure Components

Extraction & Regional Distribution

Metropolitan Water District Connection

A. Extraction Wells

B. Extraction Well Collection Piping

C. Potable Reservoir #1

D. Groundwater Treatment Plant

E. Potable Booster Station #1

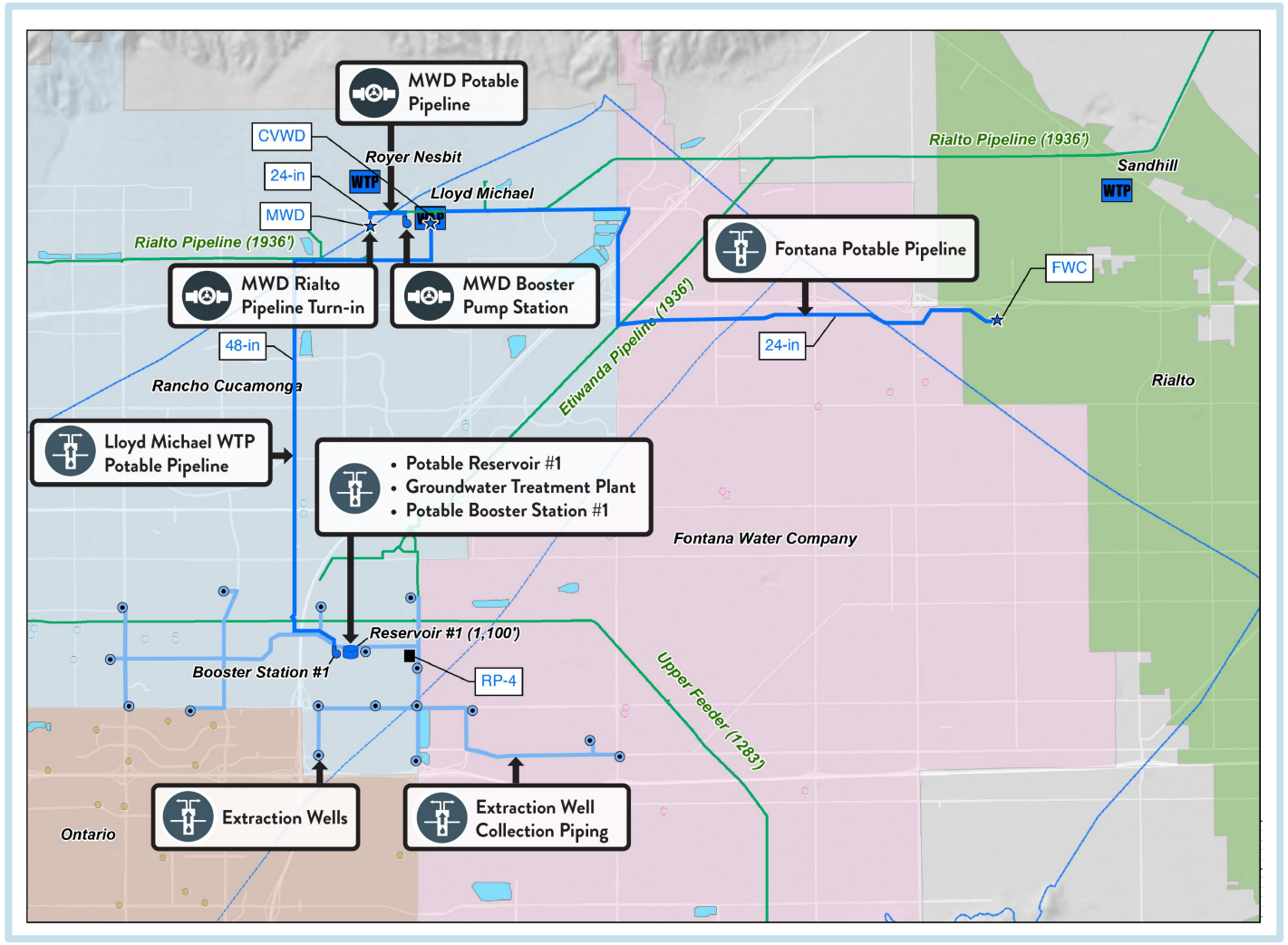
F. Lloyd Michael WTP Potable Pipeline

G. Fontana Potable Pipeline

A. MWD Booster Pump Station

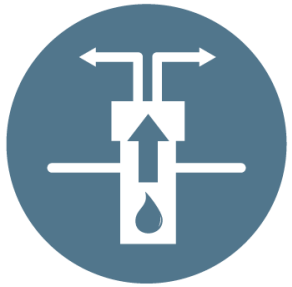
B. MWD Potable Pipeline

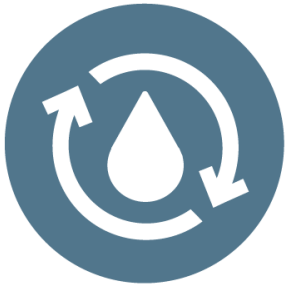
C. MWD Rialto Pipeline Turn-inFontana Potable Pipeline



Improvement: Production Facilities

- Once the new, advanced purified water is in the ground – how do we get it out to use it?
  - The CBP will develop new production facilities that will pump this new water supply out of the ground
  - An additional benefit of these production facilities is increasing access to existing recycled water supplies that are not currently being maximized
  - Ability to increase groundwater production to meet community needs if/when imported water supplies are constrained





Improvement: New Pipelines

Where do we get the supply to develop the new advanced purified water?

- Development of pipelines to connect into partner systems like the City of Rialto; purchasing excess recycled water supplies
  - New pipelines will help efficiently utilize and access recycled water supplies and promote sustainability

- CBP proposes the construction of new:
  - Recycled Water Pipelines
  - Purified Water Pipelines
  - Potable Water Pipelines

- New CBP pipelines will connect existing and proposed facilities like a new Advanced Water Purification Facility and Recycled Water Booster Pump Stations to proposed and existing reservoirs, extraction wells, aquifer replenishing wells and Metropolitan Water District mainline.

IEUA Regional Water Recycling Plant No. 1 Pipelines

Environmental Benefits of CBP

Local:

- Program adheres to conservation plans laid out in the Upper Santa Ana River Habitat Conservation Plan
- The Rialto Recycled Water intertie project (part of CBP) will help alleviate high temperature flows to the Santa Ana River
    - High temperature flows negatively impact native fish species like Santa Ana Sucker Fish and the Arroyo Chub

Statewide:

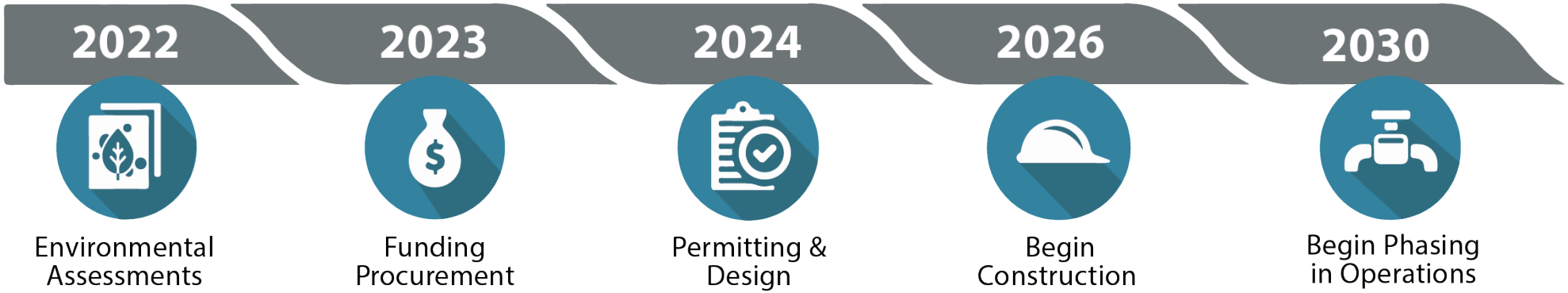
- Will allow for additional releases from Oroville Reservoir to the Feather River to support the Bay Delta ecosystem
- The local use of CBP water will help to facilitate pulse flows when called upon by the state to benefit native fish species, primarily, the endangered Chinook salmon

Santa Ana Sucker

Arroyo Chub

Chinook Salmon

What's Next for the CBP?



In 2023:

- Finalizing term agreements with participating agencies
- Pursuing additional grant and loan funding opportunities
- Construction of exploratory borings in the City of Rancho Cucamonga
- Completion of preliminary design reports for the CBP PUT infrastructure

Chino Basin Program Partners & Supporters

Partners

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Cucamonga Valley Water District
Service Beyond Expectation

Jurupa Community Services District
Proudly serving Jurupa Valley and Eastvale

Fontana Water Company

Inland Empire Utilities Agency
A Municipal Water District

City of Rialto

Supporters

Three Valleys MWD

City of Pomona

Chino Basin Water Conservation District

City of Chino Hills

Chino Basin Watermaster

Western Municipal Water District

Fontana California

The Nature Conservancy

Chaffey College

Inland Empire Economic Partnership

American Rivers
Thriving By Nature

SAWPA

Pacific Coast Federation of Fishermen's Associations
PCFFA
Stewards of the Fisheries

GoldenGate Salmon Association

Golden Gate Fishermen's Association

California Water Boards

California State University San Bernardino
Institute for Watershed Resiliency

Inland Empire Waterkeeper

Ultimate Source

Chino Valley Chamber of Commerce

CDA Chino Basin Desalter Authority

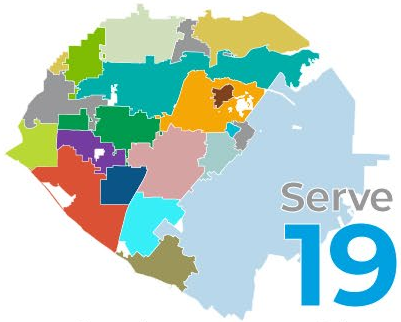
California Adaptation Forum

Mehul Patel, P.E.
Executive Director of Operations

August 2, 2023

SINCE 1933

Orange County Water District

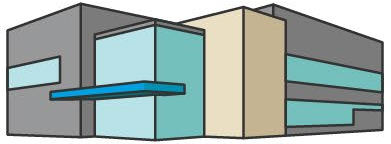


local water providers
and 2.5 million people

Groundwater
Basin provides

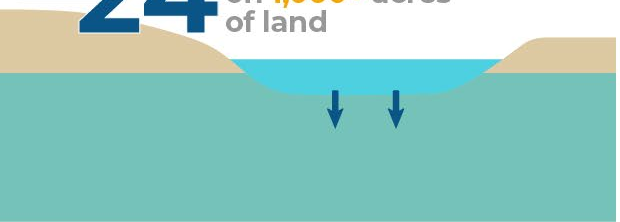
85%

drinking
water
supply

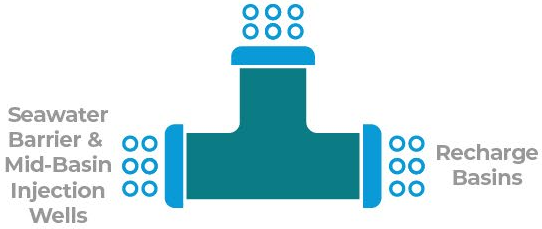


OVER **20,000 samples**
400,000 results

24 recharge basins
on 1,000+ acres
of land

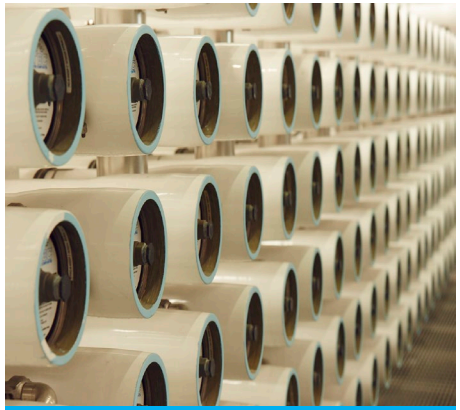


G | W | R | S
GROUNDWATER REPLENISHMENT SYSTEM



GWRS FINAL EXPANSION
130 MGD
serving **1 million**
people

Sustainable Groundwater Management



Water Reuse

Stormwater Capture

Santa Ana River

Basin Recharge

Sources of Recharge into the OC Groundwater Basin

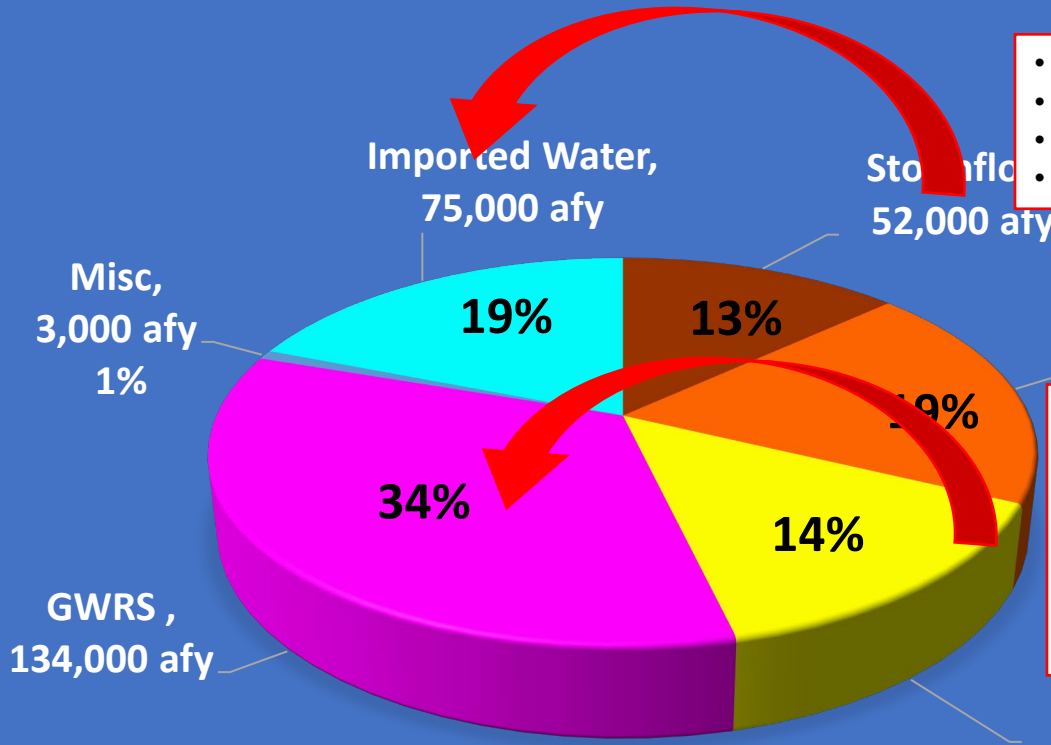
- ✓ RO-treated Recycled Water
- ✓ Imported Water
- ✓ Santa Ana River Water

RO-treated Recycled Water

Santa Ana River Water

Imported Water: California Aqueduct / State Water Project (715 km, 444 mi) & Colorado River Aqueduct (389 km,242 mi)

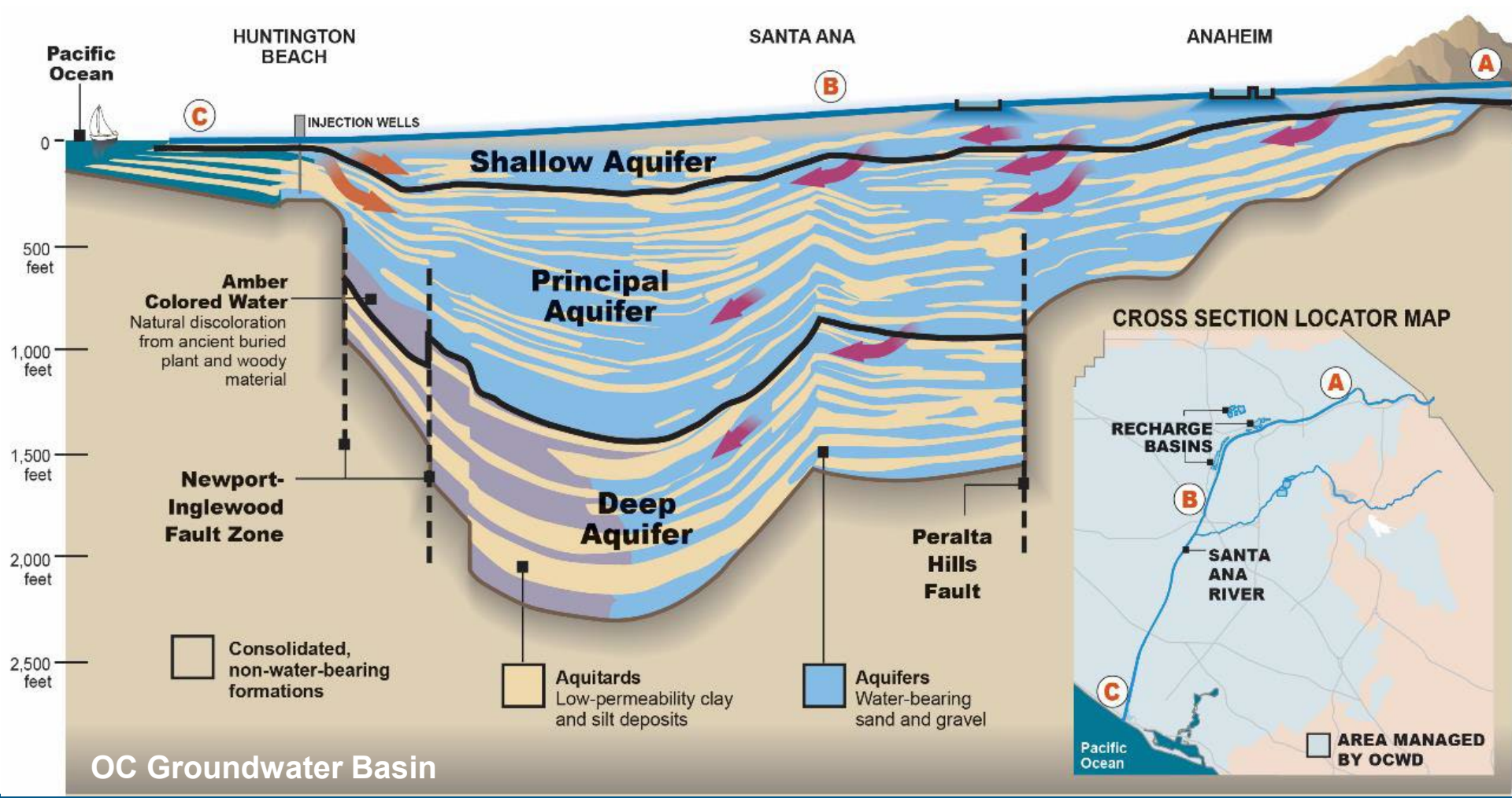
Managing OCWD's "Water Portfolio"



- Imported becoming less reliable
- Stormwater is local supply
- Stormwater is less expensive
- Stormwater has lower carbon footprint

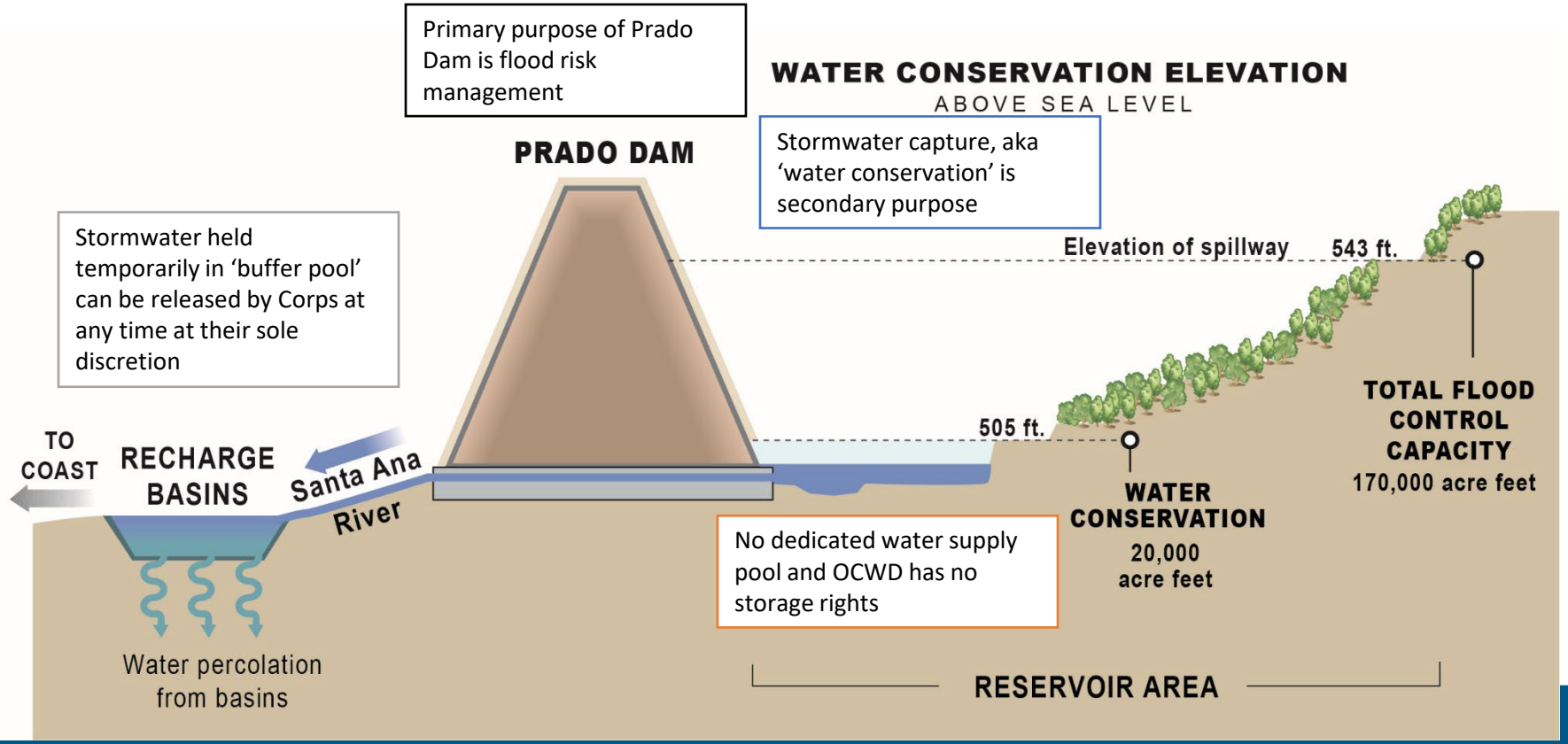
- Imported becoming less reliable
- Recycled water a is local supply available even during droughts
- Technology exists to make it equivalent or better than traditional water sources
- Makes effective use of a once wasted resource

Avg OCWD Service Area Water Demands: 395,000 afy

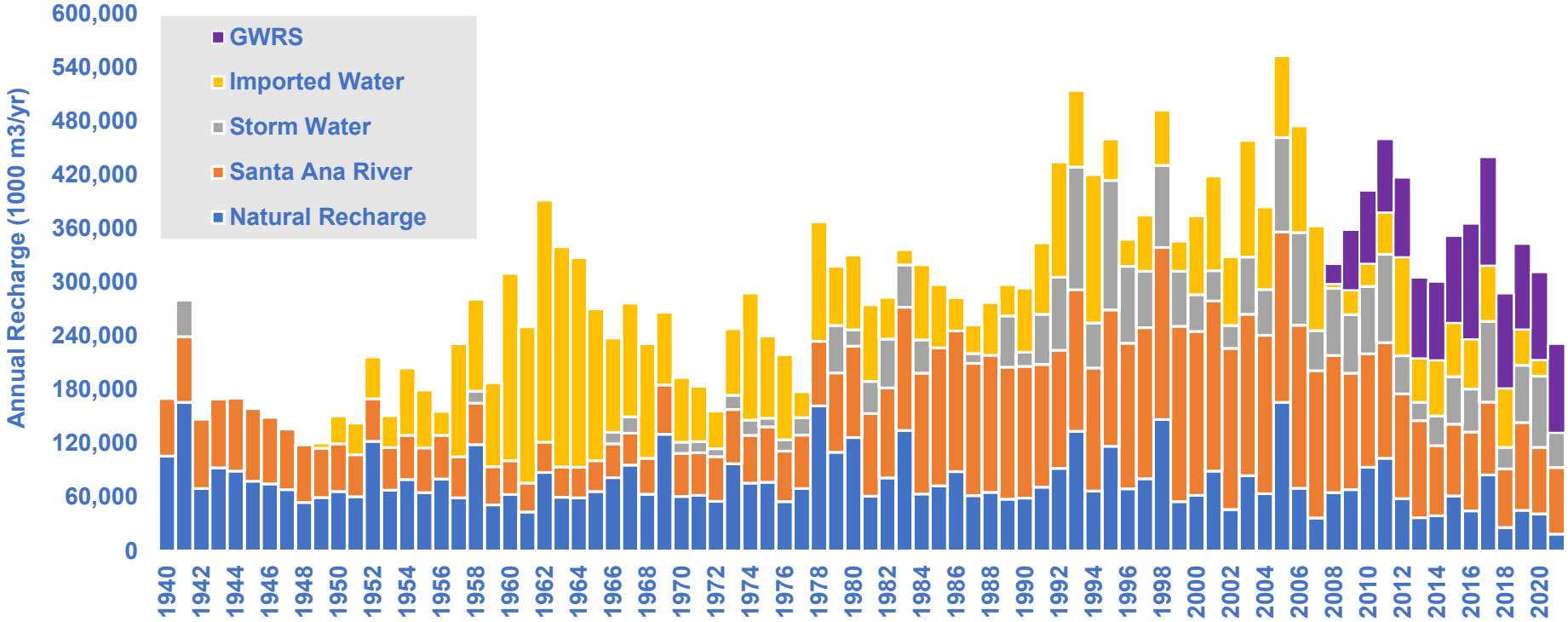


OC Groundwater Basin

Key Features of Stormwater Capture at Prado Dam



Sources of Water to Orange County Groundwater Basin



Leaders in Water Reuse

GWRS
GROUNDWATER REPLENISHMENT SYSTEM

- GWRS operational since January 2008 (70 MGD/265 m^3/d), expanded May 2015 (100 MGD/378 m^3/d), final expansion complete in early 2023 (130 MGD/492 m^3/d)
- Purifies sewer water that would otherwise be discharged to the ocean
- Replenishes the Basin with 134,000 AFY of water, enough for nearly 1,000,000 people
- Largest potable reuse project in the world

ORANGE COUNTY WATER DISTRICT
SINCE 1933

GWRS

GROUNDWATER REPLENISHMENT SYSTEM

OC SAN
ORANGE COUNTY SANITATION DISTRICT

OC San Secondary Effluent

Low Pressure Membrane Filtration

Backwash Sent to OC San

Reverse Osmosis

Concentrate Discharged to OC San Outfall

Ultraviolet Light + H_2O_2

Recharge Basins

Seawater Barrier & Mid-Basin Injection Wells

Squeezing Out The Last Drop

- GWRS Final Expansion complete in 2023 Q1
- Requires brining in new supply from OC San Plant No. 2
- Recycle 100% of OC San's reclaimable flows
- 130 MGD (492 m^3/d) capacity, enough to serve 1 million people
- Expanded treatment facilities, new conveyance facilities, pipeline rehabilitation
- Plant No. 2 source water provides new challenges (seawater intrusion, trickling filter)

QUESTIONS?

Mehul Patel, P.E.

Executive Director of Operations

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California Adaptation Forum 2023

Open Discussion

Rachel Gray
Santa Ana Watershed Project Authority

Eric Vaughan
San Bernardino Valley Municipal Water District

John Weurth
Eastern Municipal Water District

Joshua Aguilar
Western Municipal Water District

Liza Munoz
Inland Empire Utilities Agency

Mehul Patel
Orange County Water District