

Chapter Meeting

February 28, 2023

San Elijo Joint Powers Authority

Thank you to our sponsor!

Trussell

ARCADIS

carollo

ESCONDIDO
City of Choice

CITY OF
OCEANSIDE
WATER UTILITIES

The City of
SAN DIEGO

CH COOMBS-HOPKINS

FUD
Fallbrook Public
Utility District

K&A
KATZ & ASSOCIATES

MWH
CONSTRUCTORS

ESTABLISHED 1959
OTAY
WATER DISTRICT

San Diego County
Water Authority

San Dieguito Water District

CITY OF
Encinitas

SAN ELIJO
JOINT POWERS
AUTHORITY

VALLECITOS
WATER DISTRICT
Water and Wastewater Specialists since 1955

AECOM DUDEK

OLIVENHAIN
Municipal Water District
A Public Agency

ATKINS

Carlsbad
Municipal Water District

KJ
Kennedy Jenks

LEUCADIA
WASTEWATER
DISTRICT

Michael Baker
INTERNATIONAL
SAN DIEGO

PADREDAM
Municipal Water District

Rincon
del
Diablo
Water

SANTA FE IRRIGATION DISTRICT
EST. 1923

WOODARD
& CURRAN

rincon

Agenda

- Happy 2023!
- Welcome to SEJPA
- Chapter Updates
 - Regulatory & Legislative Update
 - Funding Update
 - Upcoming Events
 - San Diego Chapter Membership
- Sponsor Highlight
- San Elijo Joint Powers Authority Presentation
- Encina Wastewater Authority Presentation
- Tour of San Elijo Water Campus

Welcome to San Elijo Water Campus!



Chapter Updates

WateReuse San Diego Officers

Regulatory & Legislative Update

Governor's January Budget Proposal

- Anticipates more than \$22B deficit
- Includes \$270M for recycled water
- WRCA letter requesting \$500M

Budget Change Proposal for Recycled Water Fees

- Trailer bill to add regulatory authority to assess fees
- New SWRCB staff and other resources

Proposed Bills

- Bond Measures
- CEQA Bills
 - SB 23 (ACWA Sponsored)
 - AB 1152 (Patterson)



Funding Update



- ❖ USBR WaterSMART Recycled Water & Desalination Planning Grant, for development of new feasibility studies, solicitation open, due today February 28, 2023
- ❖ USBR WaterSMART Environmental Water Resources, conservation and management projects that have ecological benefits, solicitation open, due March 28, 2023
- ❖ Anticipate:
 - WaterSMART Large Scale Recycled Water solicitation out this spring
 - Title VXI Recycled Water & Desalination solicitations pushed to early summer

Upcoming Events

Greater San Diego Science & Engineering Fair

- Looking for chapter volunteers to judge student's work
- March 15, 11am-3pm in-person event

2023 WaterReuse Symposium

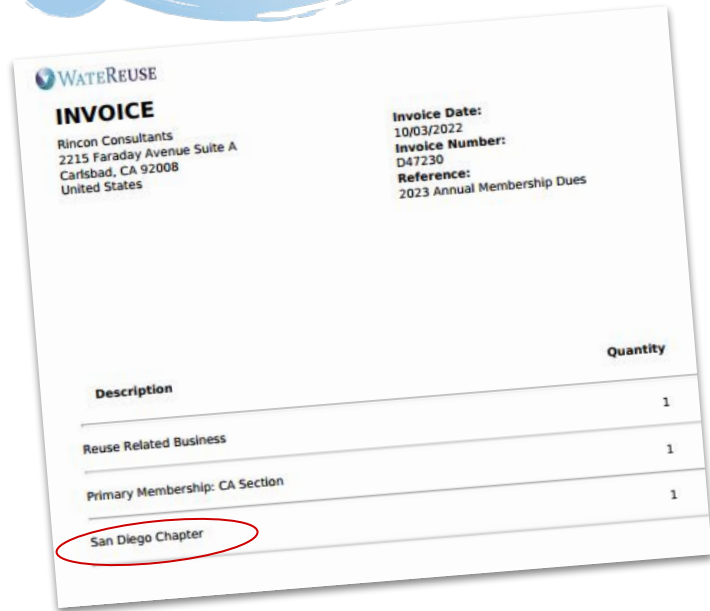
- March 5 – 8, 2023
- Marriott Marquis in Atlanta, Georgia

2023 WaterReuse California

- November 5-7, 2023 in Indian Wells, CA

WaterReuse San Diego

San Diego Chapter Membership



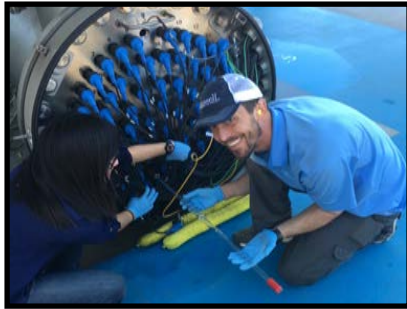
Thanks to our members who have contributed San Diego chapter dues!

- San Diego chapter dues *being added to WaterReuse National invoices* moving forward.
- If you don't see your agency/firm's name, please contact us to reissue your invoice with San Diego dues.

Sponsor Highlight

Trussell Technologies, Inc.

Trussell



Shane Trussell, President
shanet@trusselltech.com
380 Stevens Avenue, Suite 212
Solana Beach, CA 92075

San Elijo Joint Powers Authority

Mike Thornton, General Manager (San Elijo Joint Powers Authority)

San Elijo Joint Powers Authority

Recycled Water Program – Past, Present, & Future

*We value our
community, the
environment, and
our local water*

WaterReuse San Diego Chapter

February 28, 2023



Agenda

- Agency Background
- Recycled Water Program
 - ✓ Infrastructure
 - ✓ Customer Base & Demands
 - ✓ Future Opportunities



Leadership



David Zito, Board Chair
Deputy Mayor (District 1), City of Solana Beach



Tony Kranz, Board Vice Chair
Mayor – City of Encinitas



Kristi Becker, Board Member
Council Member (District 2), City of Solana Beach



Kellie Hinze, Board Chair
Council Member – District 2, City of Encinitas



Michael T. Thornton, P.E.
General Manager



Christopher A. Trees, P.E.
Director of Operations



Tom Falk, P.E., P.M.P.
Director of Infrastructure and
Sustainability

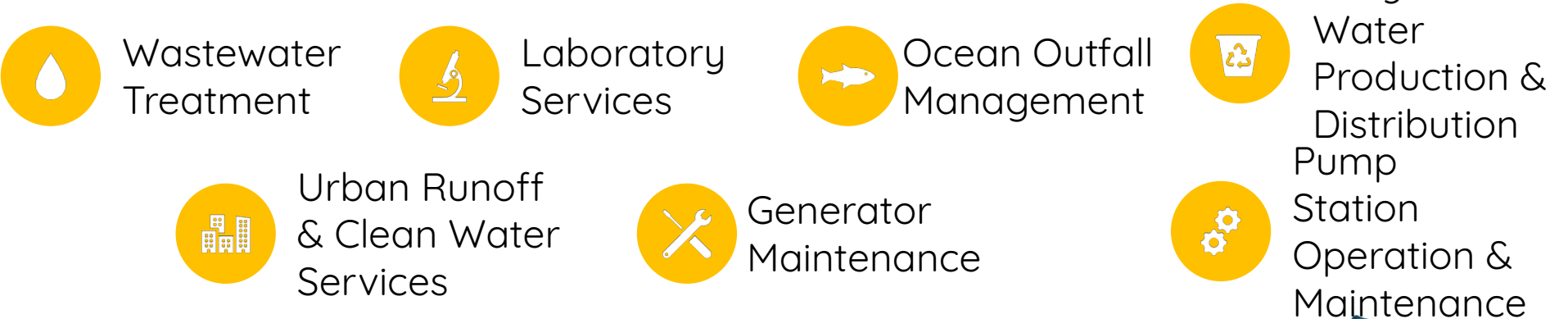


Amy Chang
Director of Finance and Administration

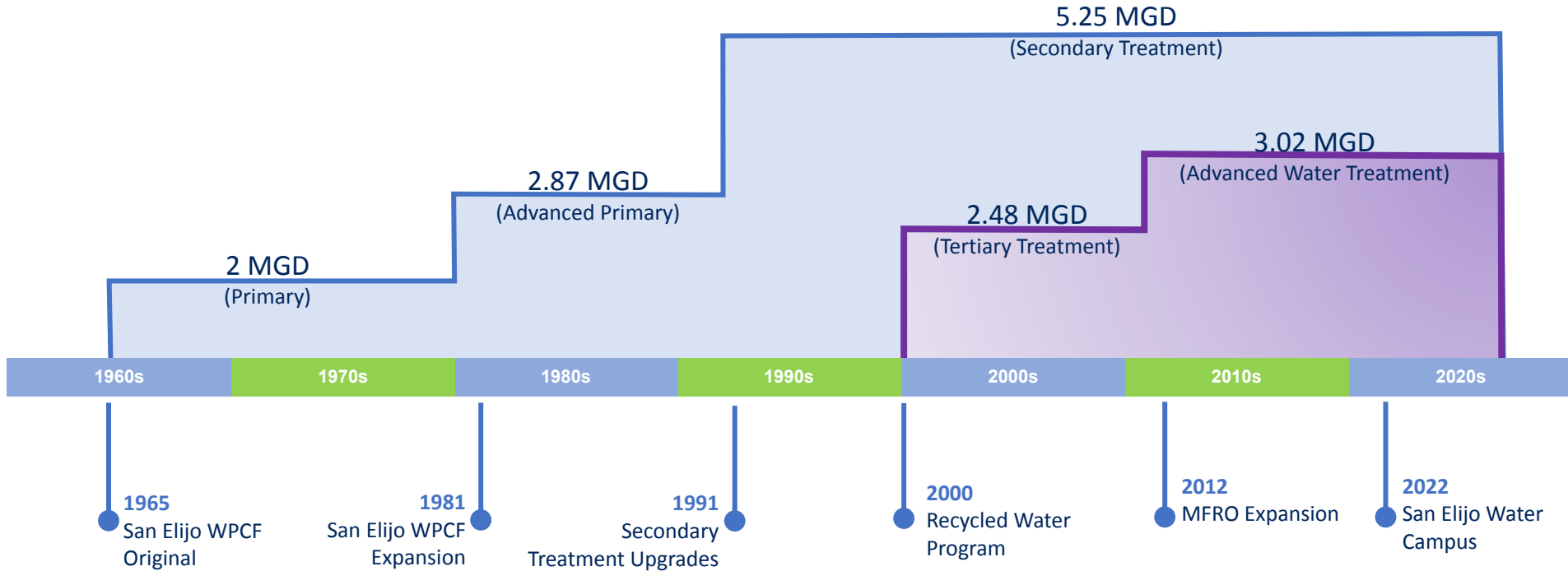
What we do...

San Elijo provides services to approx. **40,000 Customers** across a **19 square mile** coastal service area including the Cities of Encinitas, Solana Beach, & Del Mar, as well as Rancho Santa Fe.

Core Services include:



57 years of Foundational Investments



...Now in its 22nd year of operation, SEJPA's Recycled Water Program delivers nearly 2,000 AFY for landscape irrigation and industrial uses in north coastally San Diego county.

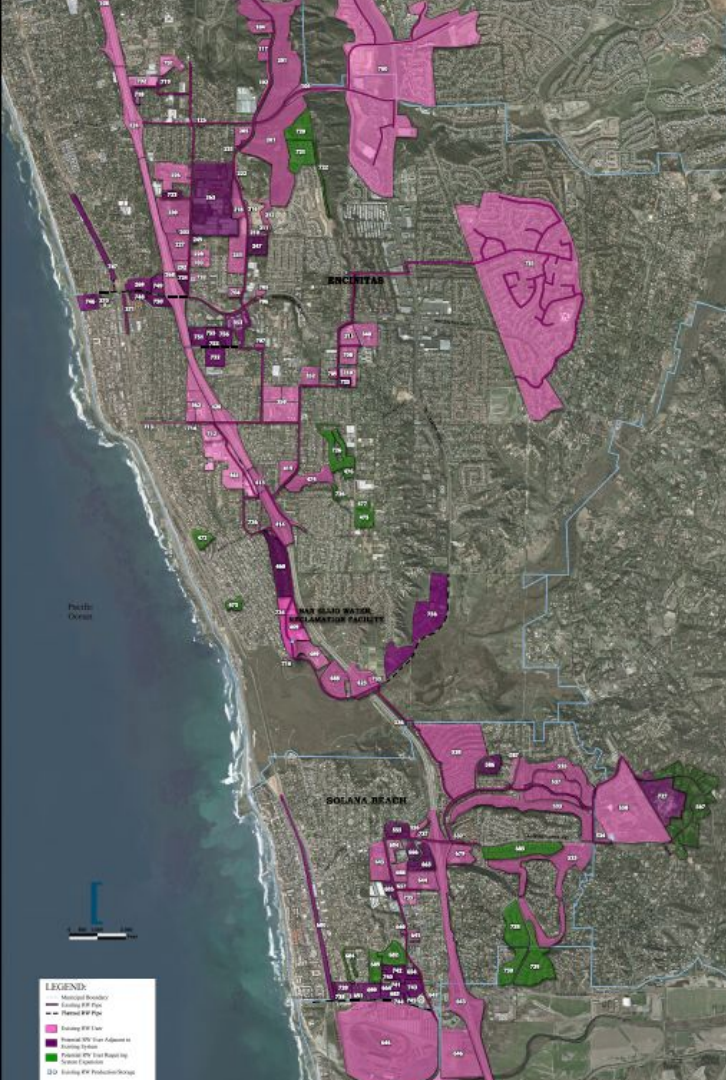


Mission:
Protecting the
environment and public
health through
wastewater, stormwater,
and recycled water
services

Recycled Water Facilities

- Recycled Water Treatment
Capacity: 3 mgd
- Parallel dual-train
treatment
 - GMF (2.5 MGD)
 - MF/RO (1.0/0.5 MGD)
- 20 miles of pipelines
- 4 storage tanks*
- 3 pump stations





Benefits Include:

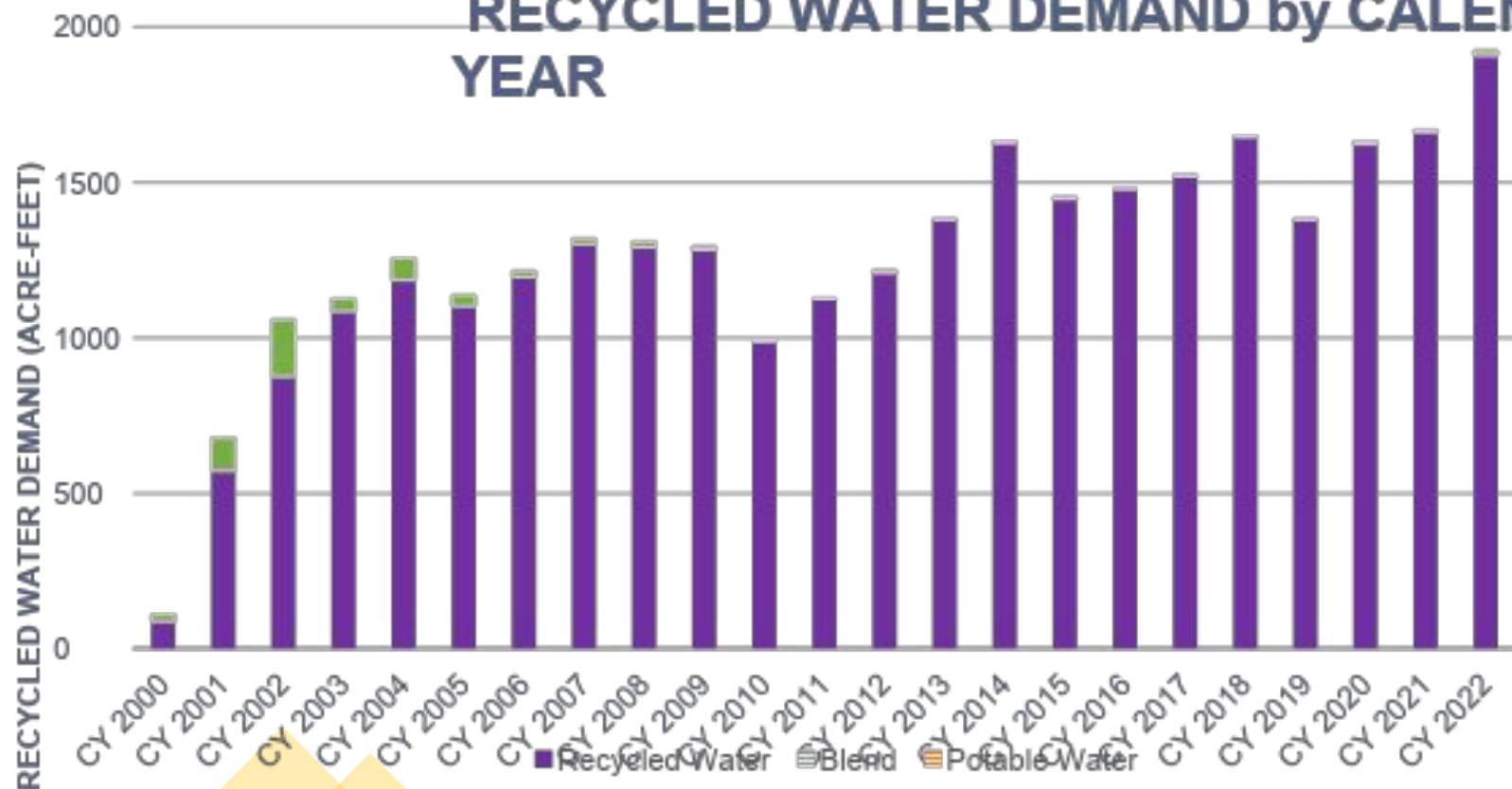
- +600 million gallons per year (~2,000 AFY)
- Locally developed, sustainable water supply
- Offsets imported water
- Reduces Ocean Discharge

Partnership with 4 water purveyors



**SANTA FE
IRRIGATION DISTRICT**

RECYCLED WATER DEMAND by CALENDAR YEAR





Proudly serving a variety of landmark institutions



Recently Completed Capital Projects

Water Campus Improvements (2021)

- ✓ \$21 million community-focused upgrades
- ✓ 0.6 MW PV Solar (25% of onsite demand)
- ✓ Water education, research & vocational training
- ✓ Bike/pedestrian path supporting community mobility
- ✓ Community Parking & EV Charging Stations

Encinitas Ranch Recycled Water Project (2019)

- ✓ \$1.8 million
- ✓ 45 AFY expansion for agriculture, community landscaping, parks, and trails
- ✓ IRWM & Federal grant funding



Stormwater Capture & Reuse

- ✓ Improve Water Quality in the San Elijo Lagoon by capturing, treating and reusing urban runoff & stormwater flows
- ✓ Provides new water supply for reuse
- ✓ Environmental stewardship & community connection



Wanket Tank Refurbishment & Conversion

- *Partnership project between SDWD, OMWD, & SEJPA*
- *3-million-gallon concrete reservoir*
- *Idle potable water tank since 2012*
- *Strategic location for regional interconnections*
- *IRWM grant funding support*

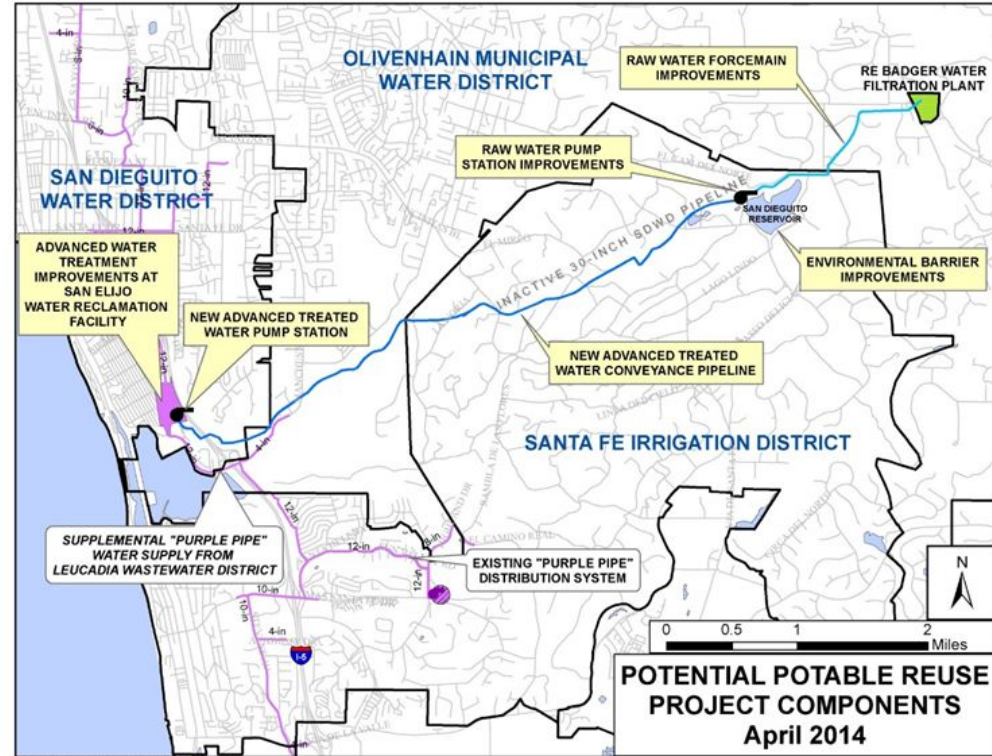


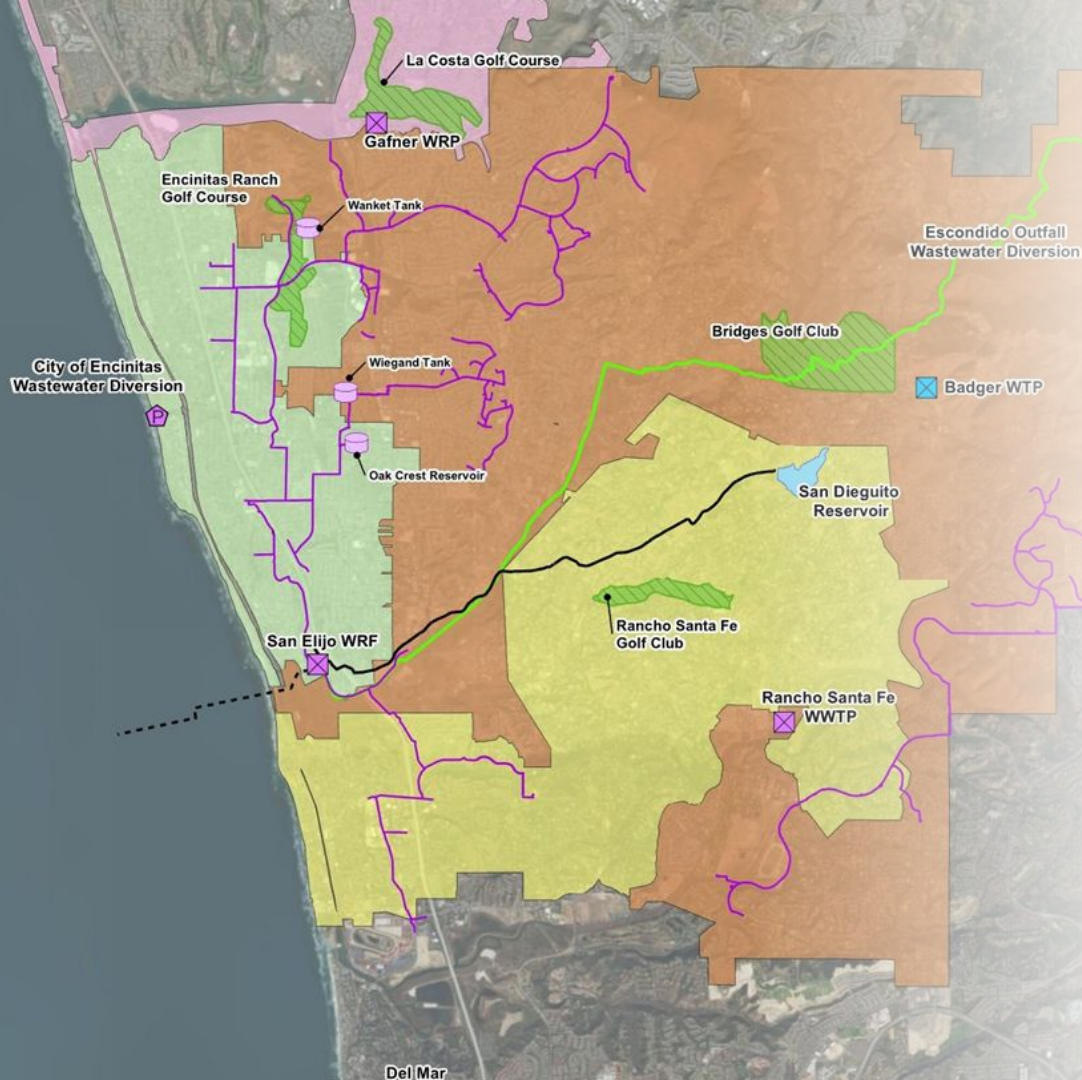
Developing an Integrated Regional System (North San Diego Water Reuse Coalition)



Previous Efforts on Potable Reuse

- Potable Reuse Feasibility Study – 2016
 - Multi-Agency Potable Reuse Project (SFID, SDWD)
 - Advanced Treated Water Supply from San Elijo Joint Powers Authority
 - Feasible and likely cost competitive with imported water
- Recycled Water Expansion Plan – 2019
 - Additional agency participation (LWWD, OMWD)
 - Identified additional source waters to meet potable reuse and recycled water demands
 - Updated to adhere with final surface water augmentation regulations





Supplies are Available to Support Existing NPR Demands and 3.1 mgd SWA project (June 2018)

- San Elijo WRF
- Del Mar Wastewater Diversion
- Escondido Outfall Wastewater Diversion
- City of Encinitas Wastewater Diversion
- Gafner WRF Expansion
- Rancho Santa Fe WWTP

Path to Expanding Reuse



Project 1

Convert to
NDN and
Chlorine
Disinfection
Upgrades



Project 2

Implement
full
microfiltration
and retire
aging sand
filters



Project 3

Implement 1
mgd Potable
Reuse



Project 4

Maximize
Reuse
Expand up to
3 mgd
Potable
Reuse

Project 1: Biological and Disinfection Upgrade

- Purpose:
 - Convert the biological treatment to provide ammonia and nitrogen removal as well as free chlorine disinfection
- Project Benefits:
 - Provides ammonia & nitrogen removal
 - Enhanced removal of organics, such as pharmaceuticals
 - Powerful free chlorine disinfection instead of combined chlorine
 - Expand chlorine contact basin (CCB) capacity to 4 MGD
 - Lower chemical and power usage by MF/RO processes
- Cost:
 - Est. Project Cost: \$8.6-10M



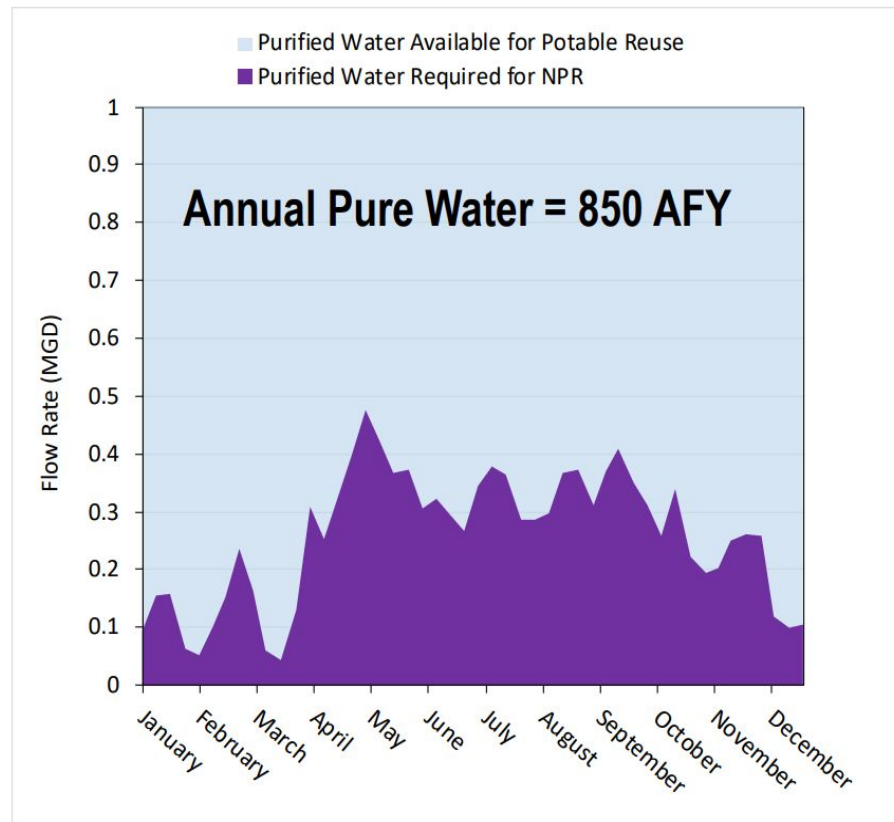
Project 2: MF Expansion and Equalization

- Purpose:
 - Provide membrane filtration (MF) for 100% of the recycled water, eliminating sand filters
- Project Benefits:
 - Improved recycled water quality
 - Complete elimination of coliform
 - Existing MF modules are at end of useful life
 - Provides additional storage to balance flows
- Cost:
 - Est. Project Cost: \$17-19M



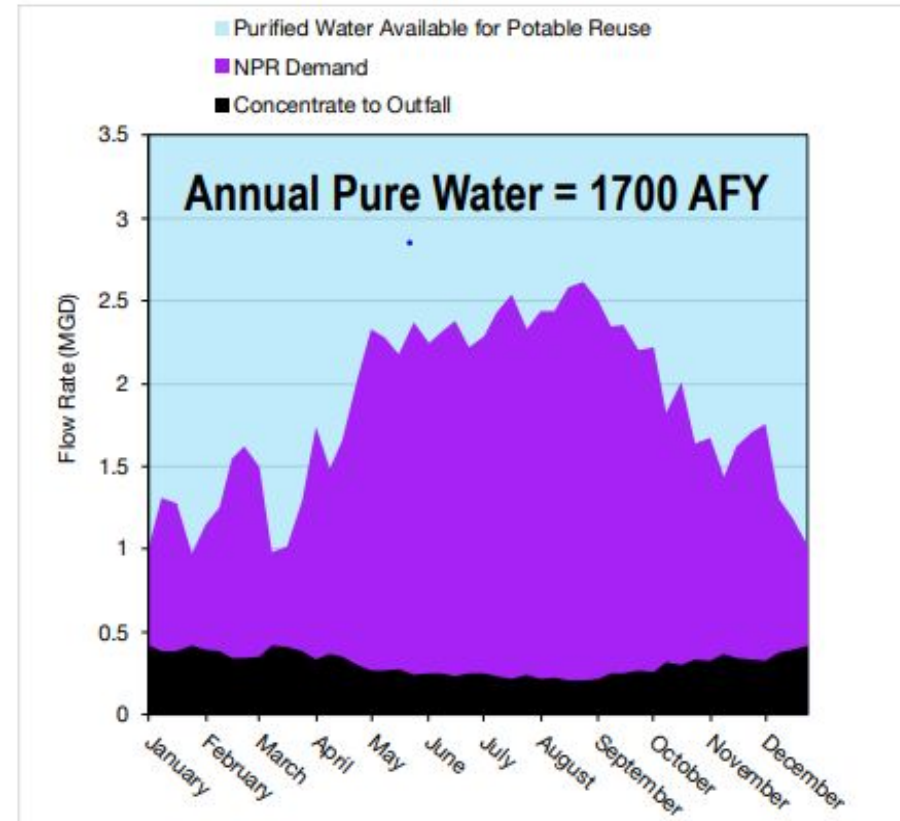
Project 3: 1 MGD of Potable Reuse

- Purpose:
 - Initiate Potable Reuse Project
- Project Benefits:
 - Increase water recycling by 850 AFY
 - Generate new revenue stream from the sale of advanced treated water
- Cost:
 - Total Project Cost: \$31-36M



Project 4: Expand Potable Reuse to 3 MGD

- Purpose:
 - *Maximize Reuse*
- Project Benefits:
 - *Additional 850 AFY of new revenue from pure water (total 1700 AFY)*
 - *Provides even more storage and equalization to balance flows for near 100% water reuse*
- Cost:
 - *Est. Project Cost: \$26-30M*



A group of business professionals in an office setting. A man in a dark suit and striped tie is on the left, gesturing with his hand. A woman in a grey blazer is in the center, looking at a tablet. Another person is on the right, holding a white coffee cup. The background is a bright office with large windows.

Questions & Discussion

Encina Wastewater Authority

Scott McClelland, General Manager (Encina Wastewater Authority)
Shane Trussell, President (Trussell Technologies)



ENCINA
WASTEWATER
AUTHORITY

One Water North San Diego

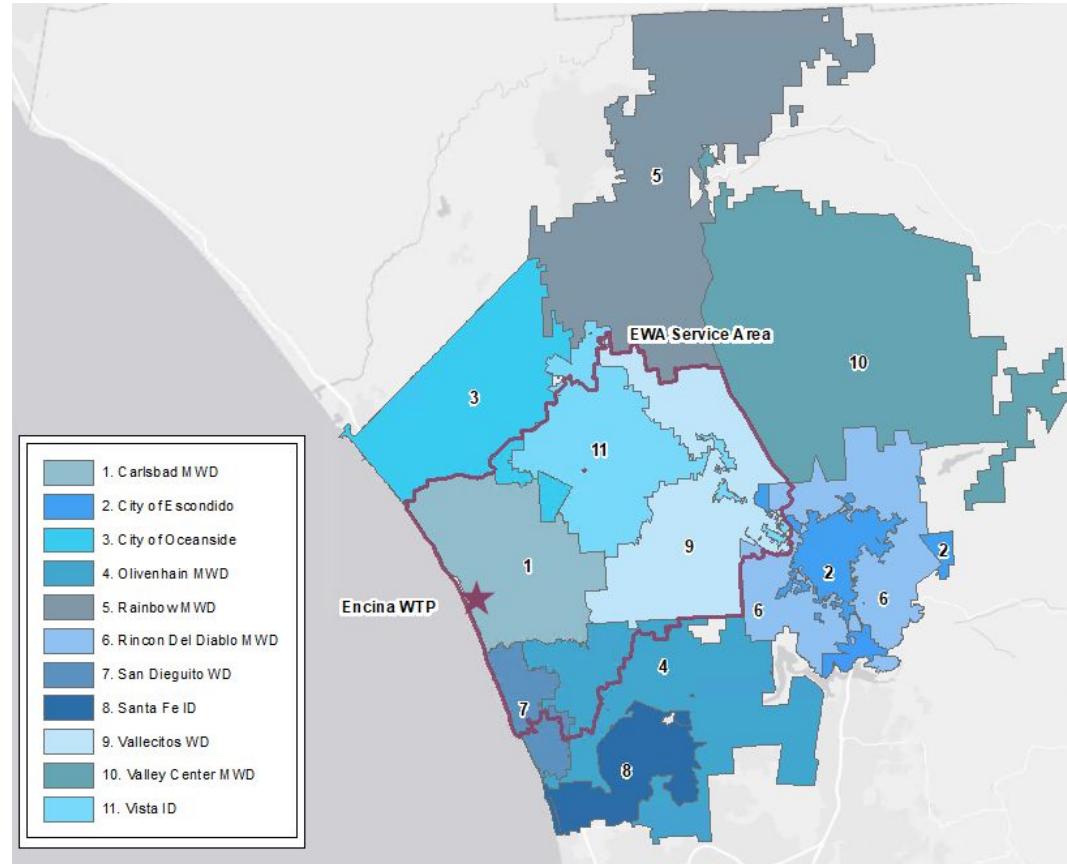
San Diego Water Reuse Chapter
February 28, 2023



Encina Wastewater Authority

- Public agency located in Carlsbad
- Provides wastewater treatment services to ~380,000 residents in northern San Diego County.
- EWA is owned by six public agencies governed by a Joint Powers Agreement:
 - City of Carlsbad
 - City of Vista
 - City of Encinitas
 - Vallecitos Water District
 - Buena Sanitation District
 - Leucadia Wastewater District

Service area map



Encina Water Pollution Control Facility (EWPCF)



Encina Wastewater Authority

- Operates and maintains:
 - Encina Water Pollution Control Facility
 - Encina Ocean Outfall
 - Carlsbad Water Reclamation Facility,
 - Member Agency Owned Pump Stations

- Encina Water Pollution Control Facility (EWPCF) represents a unique opportunity for large-scale production of purified water:
 - Ocean outfall
 - Available land for advanced treatment facility
 - Treated secondary effluent
 - Technically capable staff.

The Time is Now



Uncertainty

In times of drought and water supply uncertainty, we need reliable, local supply



Funding

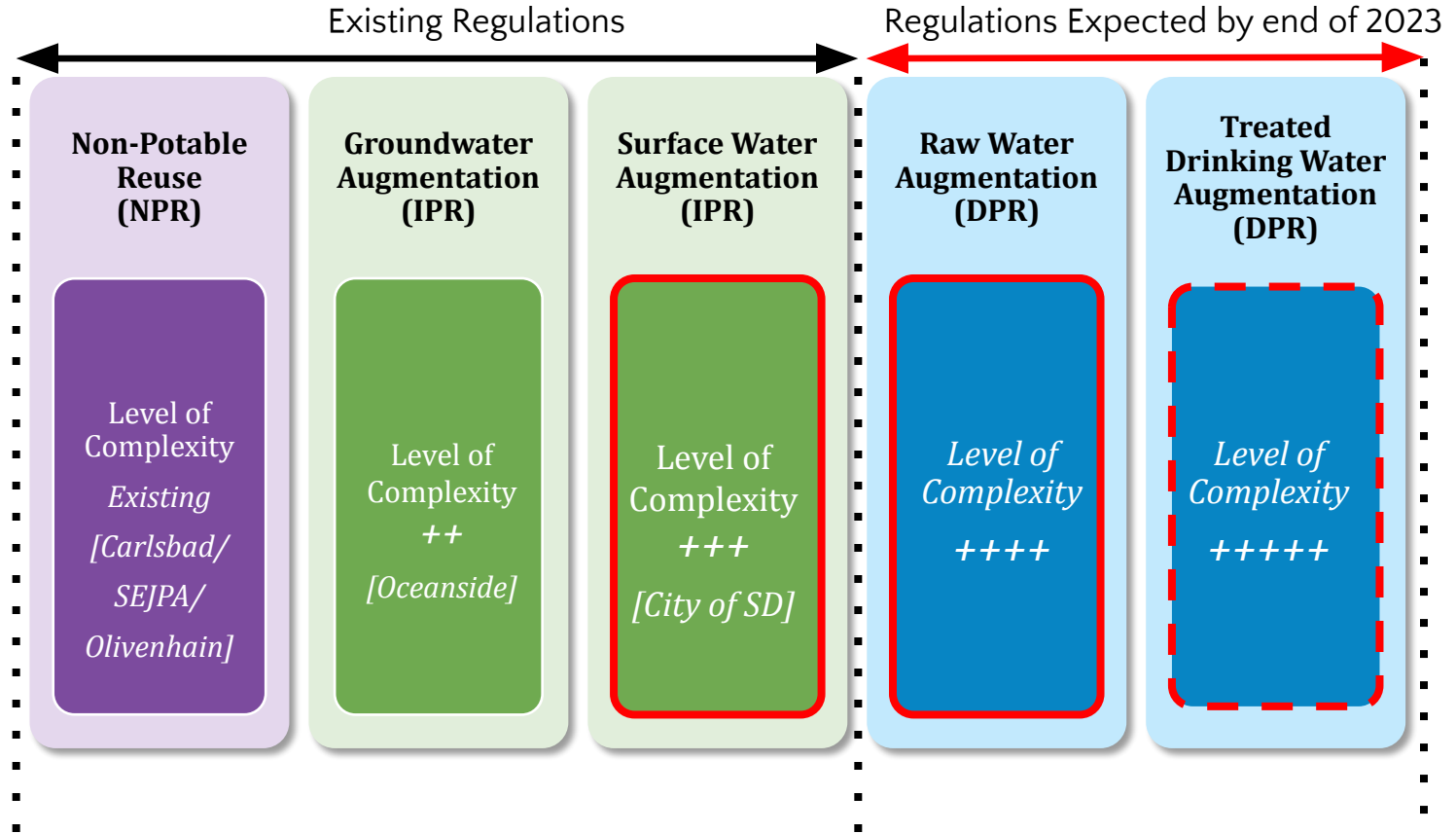
We need to capitalize on available funding opportunities



Sustainability

Reduced ocean discharge is better for the environment

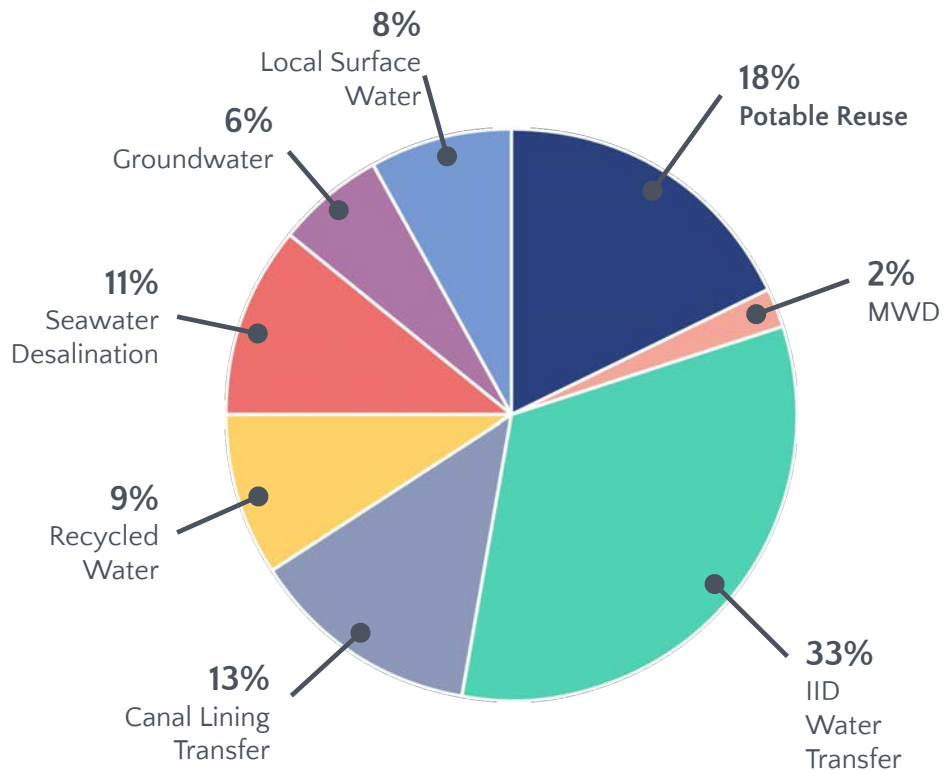
What is One Water North San Diego?





North County Needs a

New Local Sustainable Supply



Water Authority's 2035 Projected Supply Mix

*With this project
18,000-25,000 AFY
of potable reuse
water could be
created by 2040*

Future One Water North San Diego Site



EWA Reuse Benefits



- Encina can create green energy from wastewater which can be used to purify water.
- More cost-effective than sea water desalination projects

Water Reuse Project Benefits

- Wastewater benefits:
 - Reduced ocean discharges
 - Positioning for future treatment requirements (nutrient removal)
 - Consistency with regional goals and commitments on climate change action



Water Reuse Project Benefits



- Water supply benefits:
 - Addressing sustainability and resiliency objectives of local agencies
 - Addressing future water efficiency regulations
 - Reduced staff for advanced treatment
 - Cost competitiveness with imported or desalinated
 - Reducing imported water purchases

Potable Reuse Strategic Plan Development

- 2-Year Effort
 - Funding strategy
 - Partner outreach
 - Regulatory strategy
 - EWPCF improvements
 - Strategic Plan
- Coalesce the Coalition
- Refine next steps
- Pilot studies
- Concept designs
- Updated cost estimates



The Schedule

Years	1	2	3	4	5	6	7	8	9	10
Planning										
Funding										
Regulatory										
Environmental										
Design/Construction										
Stakeholder/Public Outreach										

Our Ask: Provide Support

One Water North San Diego



Advocacy Agencies

Agency	Included supply in UWMP	Advocacy Agency Support
Carlsbad	✓	✓
Olivenhain	✓	✓
Vallecitos	✓	✓
San Dieguito WD	✓	✓
Santa Fe ID	✓	✓
Poway	✓	TBD
SDCWA	Indirectly	In talks

Ask: Become an Advocacy Agency

- Refining project concepts and costs
- Review and provide input on outreach materials and deliverables
- Advocate and solicit additional regional partners (wholesale and retail)
- Participate in project concepts, regulatory, and pursuit of funding
- Engage in discussion of potential institutional arrangements
- Consider financial participation in future phases



Next Steps: Advocacy Activities

- Discuss and develop Project concepts & alternatives
- Refine Project concepts
- Operate pilot to provide design criteria for future facility
- Complete funding and regulatory strategies
- Update concept designs and cost estimates
- Complete Potable Reuse Strategic Plan



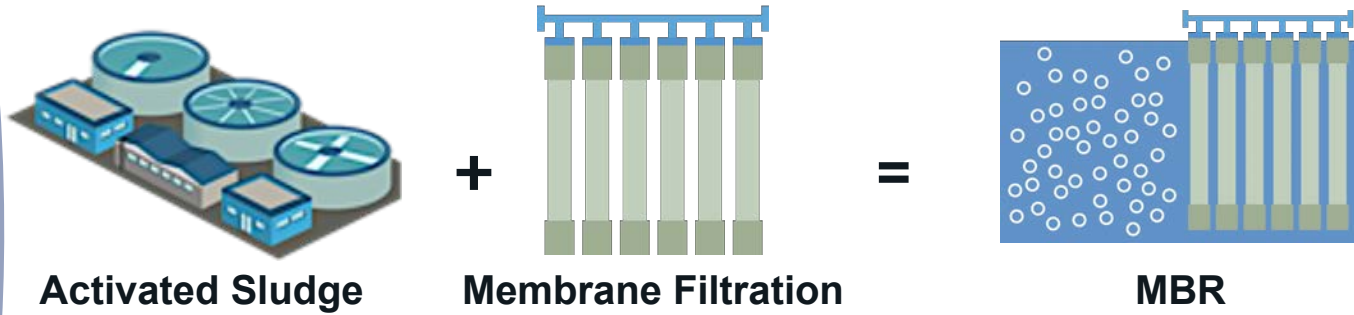


Trussell

Shane Trussell
February 28, 2023

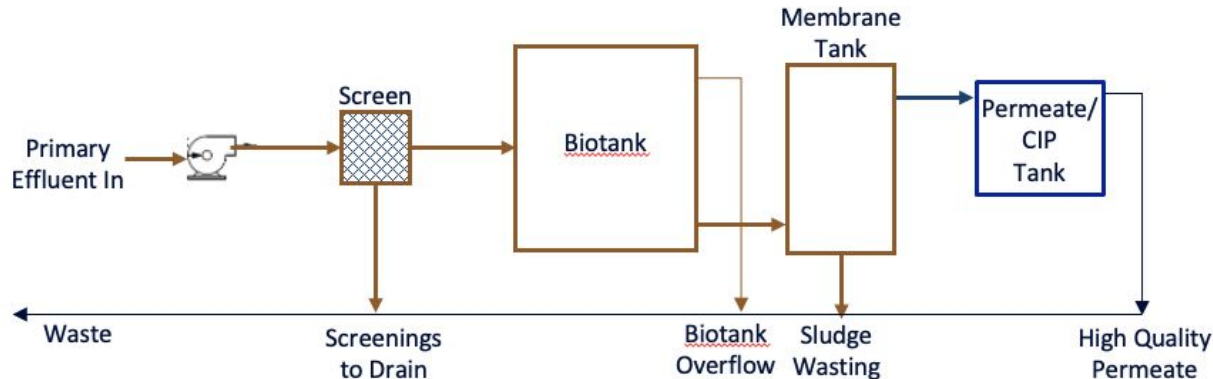
What is MBR?

- Membrane Bioreactor (MBR) process:
 - *Activated sludge process – Biological treatment*
 - *Membrane filtration – Physical separation*
- Replaces secondary and even tertiary treatment (i.e. activated sludge, clarifiers, tertiary filters)



What is MBR?

- Bioreactor:
 - *Aerobic and anoxic zones for nitrogen (i.e. ammonia, nitrite, nitrate) removal*
 - *Control parameters: dissolved oxygen (DO), hydraulic/solids retention times (HRT/SRT)*
- Membrane Tank:
 - *Hollow fiber membranes rejects solids*
 - *Control: flux (gfd) (flow per membrane area)*



Key Advantages to MBR

- Compact system
 - *Maximizes use of available plant footprint*
- Consistent high quality effluent
 - *Robust biological treatment*
 - Nitrification and denitrification (Nutrient Removal)
 - *Low turbidity (<0.05 NTU)*
 - *High quality water suitable for reverse osmosis and other advanced treatment processes*



Test Objectives

1. Optimizing MBR process for EWA to develop design parameters for facility cost estimates
2. Provide opportunity for training EWA's staff on Advanced treatment technologies supporting AWT Certification
3. Evaluate water quality in the context of potable reuse
4. Support long term planning for potable reuse

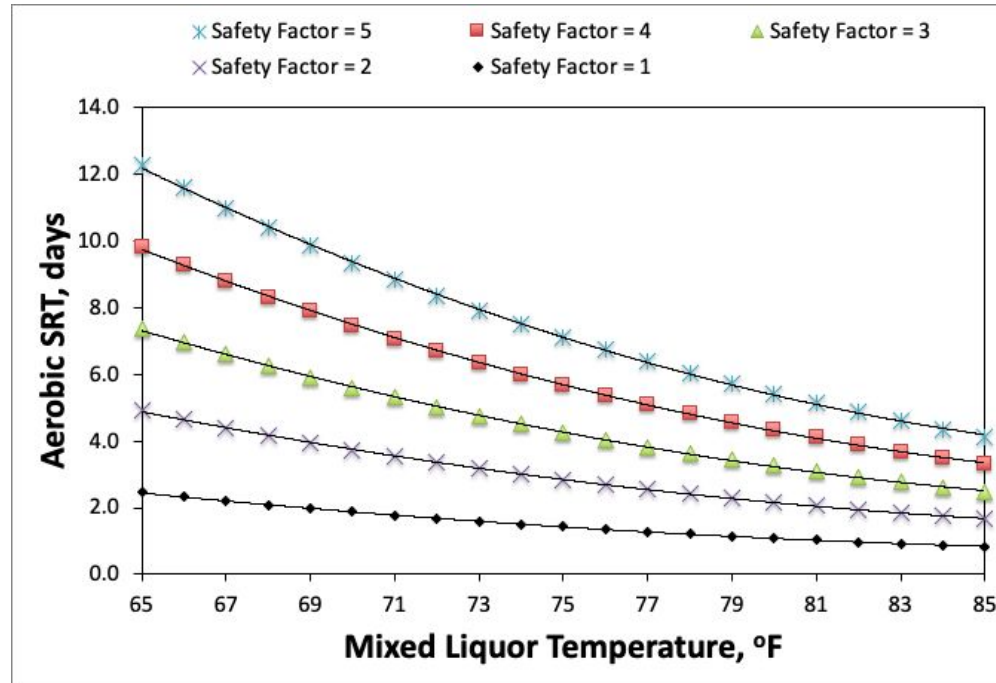


Test Objectives

- ▶ Optimizing MBR for Encina's wastewater
 - Basin requirements (HRT and SRT)
 - Aeration requirements
 - Impact of temperature
 - Maintaining high quality effluent
 - Low membrane fouling
- ▶ Goal is to achieve reliable nitrification while minimizing HRT/SRT and membrane fouling
- ▶ Potable reuse data acquisition

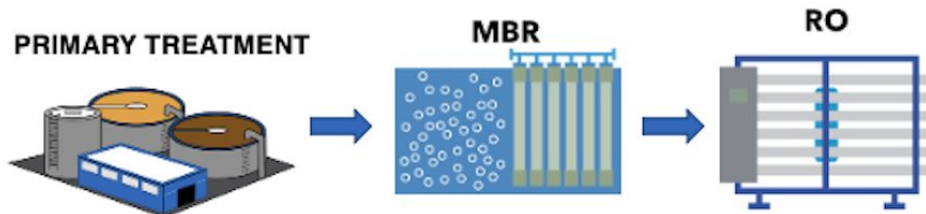


Testing Approach – Adjust SRT with Temperature



- Determine SRT safety factor required for complete nitrification and stable membrane performance

Pilot Testing of MBR + RO



MBR Startup
•October 2021

Challenge with
influent WW
identified
•February 2022

Investigate SRT
and HRT
•July 2022

Establishing
Biology
•November 2021

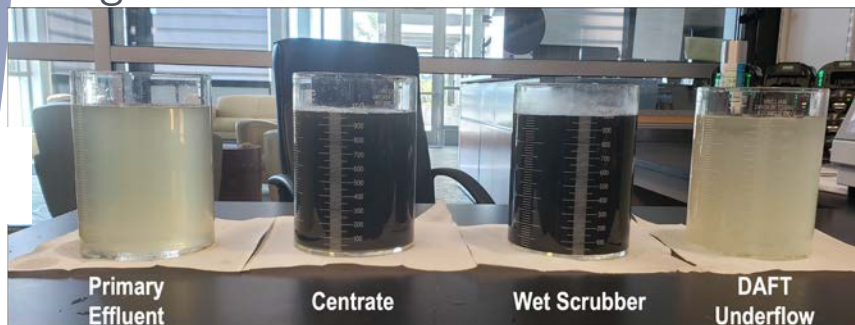
Caustic system
added
•April 2022

RO Startup
•July 2022

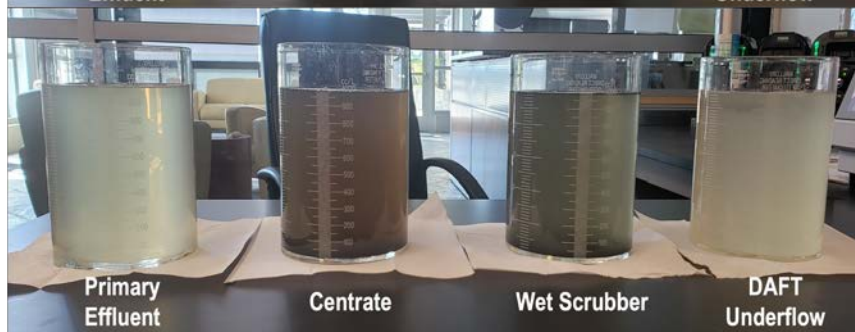
Challenging Feed Water Quality

- Return streams impacted feed water quality (centrate, wet scrubber treatment of dryer gas) –spikes in influent ammonia and difficult to treat organics

Immediately after collection



After 1 hour of settling



Feed water (ppm)	PO ₄ -P	NH ₃ -N	TSS	COD
Centrate	797	1244	1249	634
DAFT	74	54	80	114
Wet Scrubber	1558	199	348	1126

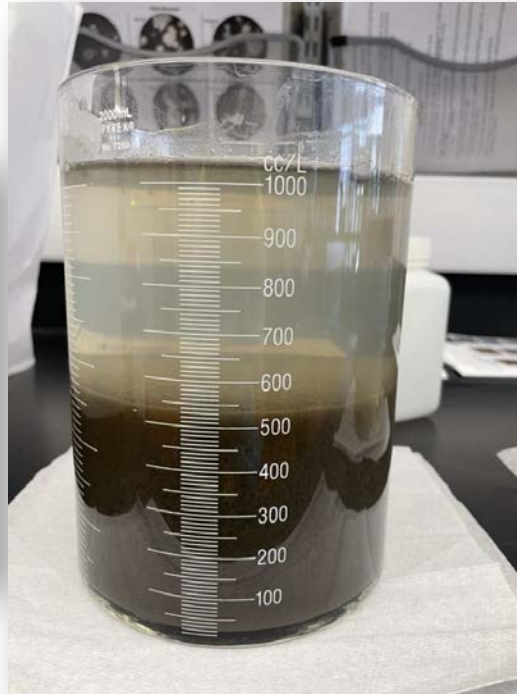
MBR Always Produced High Quality Effluent

- Reliable nitrification achieved
- Collecting important design water quality for the RO process
 - Bromide in wastewater is low (0.3 mg/L)
 - Silica in wastewater is low (<10 mg/L)

	Alkalinity	COD	TOC	NH3-N	NO3-N	NO2-N	PO4-P	TSS	BOD
Primary Eff	318	355	44	52	0.8	--	6.6	86	--
Filtrate	77	34	8.8	0.11	28	0.11	4.9	<2	<2

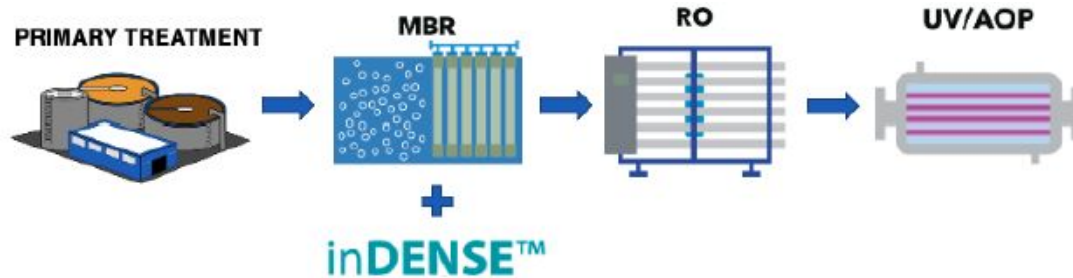
inDENSE

- Improves sludge characteristics, reduces membrane fouling



Future Pilot Testing to Begin in Summer 2023

- Relocating pilot to avoid influence of return streams
- USBR Grant R22AS00010 secured \$800,000 in funding
- Optimization of MBR-RO-UV/AOP treatment train for 2 years
- Novel pathogen crediting research



Thank you!



Tour of San Elijo Water Campus

