



Regulatory Committee Meeting Agenda
Thursday, January 25, 2024
2:00-3:00 p.m.
Zoom Meeting

Agenda

- Co-Chairs **Kevin Thomas**, Kimley-Horn and **Eric Miller**, Miller Marine Science and Consulting – Welcome

Update Items

- Legislative update
 - Resources/climate resilience bond discussion
 - Legislative proposals
- Events update
 - 2024 CalDesal Annual Conference
 - February 8-9, 2024
 - Embassy Suites, Sacramento
 - Review of program content (Attachment)
- 2024 Calendar (Attachment)

Discussion Items

- DWR's Resource Management Strategy – Excluding nexus between environmental flows and desalination
- In the News
 - Arizona desal proposals (Attachment)
 - Carbon capture/desal production (Attachment)
- Gameplan for CalDesal Regulatory Committee – 2024

Recent Project Activity, Upcoming Milestones

- Doheny Desalination Project
- Monterey Desalination Project
- Carlsbad Desalination Facility Intake Project
- MWD desalination siting and technical studies
- Santa Clara Valley Water District RFP – Desalination Engineering Feasibility Study – 1/26/24

Description of Work:

Valley Water seeks to obtain Statements of Qualifications (SOQ) from responsive, responsible, and qualified consulting firms to provide planning and engineering services to provide engineering feasibility of a seawater desalination facility (Project) in Santa Clara County with intake of seawater from the South San Francisco Bay (South Bay). A desalination facility would augment potable water supplies and serve the primary purpose of providing a new reliable water supply for current and future populations in Santa Clara County. This engineering feasibility study would build upon previously completed work by Valley Water and serve as the next planning level effort to determine technical requirements needed for the design and construction of a desalination facility in the South Bay.

This RFQ is an expedited solicitation process.

Project Objectives:

A. Evaluate engineering feasibility of a seawater desalination facility and determine its optimum location in the South Bay with minimum 10 million gallons per day (MGD) and maximum 40 MGD production capacity for drinking water supply and develop a concept level setting for the facility.

- Updates on any other ongoing desalination projects?

Other Items

Next Regulatory Committee Meeting:

February 22, 2024 – 2:00 PM



2024 Annual Conference

Desal for California's Water Resiliency, Security,
and Sustainability February 8-9 • Sacramento

Conference Schedule

Day 1: Thursday, February 8, 2024 – 8:00 AM – 5:30 PM

8:00 – Conference Opening and Welcome + Continental Breakfast (CalDesal Chair Mark Donovan and Executive Director Glenn Farrel)

8:15 – 9:30 – **Session 1 - The Societal Case for Desal: Economic Impacts of Water Scarcity**

- Moderator: **Brent Alspach** – Director of Applied Research, *Arcadis*
 - **Dr. Ellen Bruno**, Assistant Professor of Cooperative Extension, *UC Berkeley Department of Agriculture and Resource Economics*
 - **Janet Clements**, President and Founder, *One Water Econ*
 - **Edward Ring**, Senior Fellow, *California Policy Center*

9:30 – 9:35 – Break

9:35 – 10:25 – **Session 2 – A Conversation With Natural Resources Secretary Wade Crowfoot**

- Moderator: **Mark Donovan**, *CalDesal Chair*
 - **Secretary Wade Crowfoot**, *California Natural Resources Agency*

10:25 – 10:40 – Break

10:40 – 11:50 – Session 3 – Advancing Water Resilience Through Desal at the Local and Regional Levels

- Moderator: **Paul Hermann, GHD**
 - **Greg Kowalski** – *Engineering Manager, Eastern Municipal Water District and Lee Portillo* – *Project Manager, Black & Veatch*
 - **Robert Richardson** – *Principal Engineer, United Water Conservation District*
 - **Paul E. Shoenberger, P.E.** – *General Manager, Mesa Water District*

11:50 – 1:30 – Lunch – Keynote Speaker:

- **Peter MacLaggan**, *Former Vice President, Poseidon Water*

1:30 – 2:45 – Session 4 – Media Perspectives on Desalination

- Moderator: **Kathleen Ronayne, Associated Press**
 - **Steven Greenhut**, *Southern California News Group*
 - **Ari Plachta**, *Sacramento Bee*
 - **Dan Walters**, *CalMatters*

2:45 – 3:00 – Break

3:00 – 4:15 – Session 5 – Offshore Desalination Advancements

Moderator: **Tim Hogan, TWB Environmental Research and Consulting**

- **Kalyn Simon**, *Ocean Well*
- **Borja Blanco**, *Waterise*
- **Shawn Meyer-Steele**, *Oneka Technologies*
- **Peter Stricker**, *Sea Well*

4:15 – 4:20 – Break

4:20 – 5:20 – Session 6 – Women in Desalination

Moderator: **Kim Adamson, Kiewit Infrastructure**

- **Lihy Teuerstein**, *IDE Technologies*
- **Heidi Luckenback**, *City of Santa Cruz*
- **Elena Rodriguez**, *Ingeteam (Invited)*
- **Michelle Peters**, *Channelside Water Resources*

5:20 – Wrap-up and reminder of Day 2 conference activities (**Executive Director Glenn Farrel**)

5:30 – CalDesal Reception – Embassy Suites – 1st Floor Reception Area

Day 2: Friday, February 9, 2023 – 8:00 AM – 12:00 PM

8:00 – 9:00 – Continental Breakfast

8:00 – 9:15 – Session 7 – Current Seawater Desalination Project Updates: Doheny + Monterey + Carlsbad

- Moderator: **Mark Donovan**, Chair, *CalDesal Board of Directors*
 - **Marc Serna**, *Doheny Desalination Project*
 - **Chris Cook**, *Monterey Water Supply Project*
 - **Eric Miller**, *Miller Marine Science & Consulting*
 - **Jeremy Crutchfield**, *Water Resources Manager, San Diego County Water Authority*

9:15 – 9:45 – Session 8 – State Agency Perspective on California's Desal Future

- Moderator: **Eric Miller**, *Miller Marine Science & Consulting*
 - **Tonianne Pezzetti**, *California Department of Water Resources*

9:45 – 10:45 – Session 9 – Seawater Desalination Opportunities – A Federal Perspective

- Moderator: **TBD**
 - **Jack Simes**, *U.S. Bureau of Reclamation*
 - **Roger Gorke**, *U.S. Environmental Protection Agency*
 - **Meagan Mauter**, *Research Director, National Alliance for Water Innovation*

10:45 – 11:00 – Break

11:00 – 12:00 – Session 10 – Gameplanning CalDesal's Engagement in Upcoming Ocean Plan Amendment Process

- Moderator: **Eric Miller**, *Miller Marine Science & Consulting*

12:00 – Final Remarks and Conference Close (Chair Mark Donovan and ED Glenn Farrel)



Purple: Outreach Communications Committee
Blue: Board Meetings and Conferences
Green: Executive Committee
Gray: Technology/Innovation Committee

Dark Blue: Legislative Committee
Yellow: Regulatory Committee
Red: State Holidays
Violet: Annual Conference

2024 Calendar

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ALERT TOP STORY TOPICAL

Arizona proposals to import water are dominated by desal plants

Tony Davis

Jan 20, 2024

Tony Davis

Detailed plans for seawater desalination, mostly from Mexican coasts, dominate a list of more than 20 project ideas sent to an Arizona agency for importing water into this increasingly thirsty state.

The desalination projects, submitted to the Water Infrastructure Finance Authority of Arizona, are proposed for all over the region's map. The locations range from Baja California's Pacific Coast to Southern California's coastline to near biosphere reserves in northern Sonora to that Mexican state's western coastline.

One would retrofit and reopen the mothballed Yuma Desalting Plant, built more than 30 years ago but never fully used. The much-discussed, Israeli-based IDE Technologies desal project to bring desalted water by pipeline 200 miles north from Puerto Peñasco, Sonora to the Phoenix area was submitted again to the authority, whose board agreed in late 2022 to negotiate over it but then backed off.

People are also reading...

- 1 **Tucson doctor accused of performing illegal surgeries on dogs**
- 2 **U of A athletic director Dave Heeke out; Mike Candrea to take over on interim basis**
- 3 **Tucson siblings welcome their mom home**
- 4 **Hawaiian restaurant chain opens first**

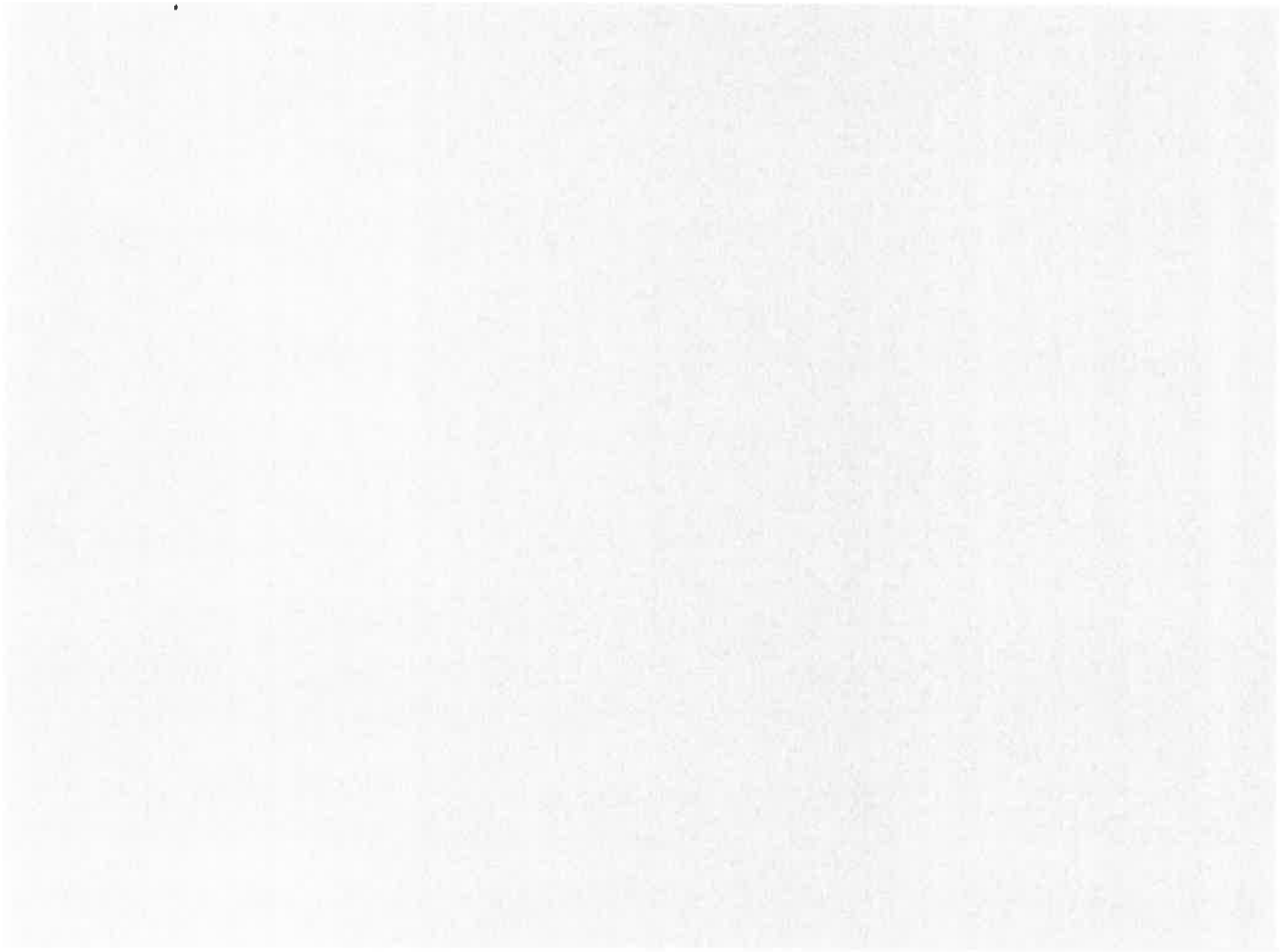
In all, more than a dozen project ideas submitted to the authority are wholly or partially devoted to expensive projects to make seawater drinkable using reverse osmosis or other technologies to remove the salt.

One desal proposal has a clear Southern Arizona connection. It would combine a water desalting project with a lower-tech plan to bring more stormwater and treated sewage effluent into the Santa Cruz River Basin in Southern Arizona and Northern Sonora. It has drawn interest from the Tucson Water utility to buy some of the water, the project proposal said, calling Tucson Water one of its “allies.”

Reached for comment, a Tucson Water spokeswoman, Natalie DeRoock, confirmed that utility officials have talked with others involved in this project. But she added, “It’s too early to comment. So much would have to happen for Tucson Water to say they are interested.”

Proposed by a team of companies along with the University of Arizona’s Water Resources Research Center, this project would try to capture more stormwater and upgrade the Nogales International Wastewater Treatment Plant so it could treat more wastewater. These ventures would funnel more water into the Santa Cruz River and its aquifer in Southern Arizona.

A benefit the project’s backers cited is that “Increased effluent discharged to the Santa Cruz River can be an additional water source for City of Tucson, helping them reduce their Central Arizona Project usage, making it available for other cities such as Phoenix.”



LEFT: One of the desalination proposals submitted to a state agency has a clear Southern Arizona connection. It would combine a water desalting project with a lower-tech plan to bring more stormwater and treated sewage effluent into the Santa Cruz River Basin in Southern Arizona and Northern Sonora. (In this 2019 photo, reclaimed water released by the city of Tucson started to fill a long-dry area of the Santa Cruz River at 29th Street.) **RIGHT:** Since farms use up to 80% of the Colorado River Basin's water and about 72% of water consumed in Arizona, two big project proposals target farms for water savings they say could flow to city users or be saved in the Colorado River's depleted reservoirs.

Mamta Popat (left), Arizona Daily Star 2019 and Randy Hoeft (right), Yuma Sun file

"I can't imagine we would have said that. That is definitely not from us," Tucson Water's DeRoock said of that reported benefit.

Other project ideas sent to it include some more grandiose and expensive and some less expensive than the ocean water desalination projects, many of which would cost over a billion dollars, with one pricing itself at \$17 billion.

Still higher on the list of megaprojects, dollar-wise, is a \$125 billion plan, floated by a Las Vegas-based company, to carry out a long-delayed, hotly-contested dream of **bringing water to the entire Southwest from the Columbia River.**

Western Water Project LLC seeks to carry out a plan first pushed and later killed back in the 1960s by Arizona and California officials to import enough water to stave off the now-realized possibility of Colorado River shortages.

Another plan, whose cost wasn't estimated, would ship water to the Southwest from New York state, Kentucky and Tennessee by rail cars. It's proposed by an Oregon company called Water Train Inc.

One project promises to bring 12.3 million acre-feet of water a year to Arizona — 12 times more than recent, annual Central Arizona Project deliveries — by dramatically ramping up how efficiently farmers use water to irrigate their crops. Another would harvest water from the atmosphere — “to convert atmospheric water vapor into safe, reliable, and high-quality drinking water,” in the proponent's words.

Other, less expensive project ideas center on desalinating brackish groundwater supplies known to underlie areas of the state in or near Buckeye, Gila Bend and the Yuma area. Still others would transfer groundwater from the few, rural Arizona counties where that's allowed, to satisfy thirsty, fast-growing cities such as Buckeye where future homebuilding has been stalled due to groundwater shortfalls.

Agency has \$500 million

These aren't formal proposals to the authority, although many are couched in the language of such proposals. They were sent to the authority before a late 2023 deadline in response to an advertised request for information about potential projects.

The water financing authority, a state agency, has \$500 million to spend on water augmentation projects and is lobbying for more.

“I do want to emphasize that these are not a ‘menu’ of projects from which (the authority) will choose,” authority spokeswoman Chelsea McGuire said in an email. “Instead, these are responses that give us insight into the universe of feasible

augmentation projects, introduce us to interested players, helped those players collaborate and coordinate with one another, and provided suggestions for the financial and legal structure of a project.”

By spring, the authority staff hopes to issue a formal solicitation for specific proposals and, in the fall, to start negotiating with project proponents, McGuire said. “If we’re not ready to do it then we are going to work until we are ready,” she said.

Overall, “(the authority) was very encouraged to see the number and diversity of respondents, which we believe shows there is enthusiasm and capacity for engaging in a long-term augmentation project,” McGuire said.

Some major players

For more than a half-century, a host of water experts around the U.S. and worldwide have called desalinating seawater the “ultimate solution” to the water shortages in the U.S. West, particularly in the overallocated Colorado River Basin. Its backers have called it a “drought proof” fix.

But while desalination has flourished in the Middle East and gained headway in Australia, it has not caught on as widely in the U.S. Only two major U.S. seawater desal projects — one near San Diego, the other in Tampa Bay, Florida — have gone online, although smaller projects have been built in California.

Others have been delayed or killed, most notably a big one in Orange County, California, due to their cost, concern about their high energy use and beliefs from some critics that they’re not needed.

In ideas sent to the Arizona authority, several project proponents make the case that their planned desal facilities would employ technologies using less electrical energy than typical plants, or that they could rely on renewable energy that is seldom used today by desal plants.

Many project proponents have brought in as partners major players in the water development sector and the financing sector, such as Carollo Engineers, AECOM Technical Services and Kiewit, which have designed or built desalination plants and other water projects around the world including in Arizona.

Some officials in some of the proponent companies have track records working to design and/or build the Carlsbad, California desal plant that's been in operation since 2015.

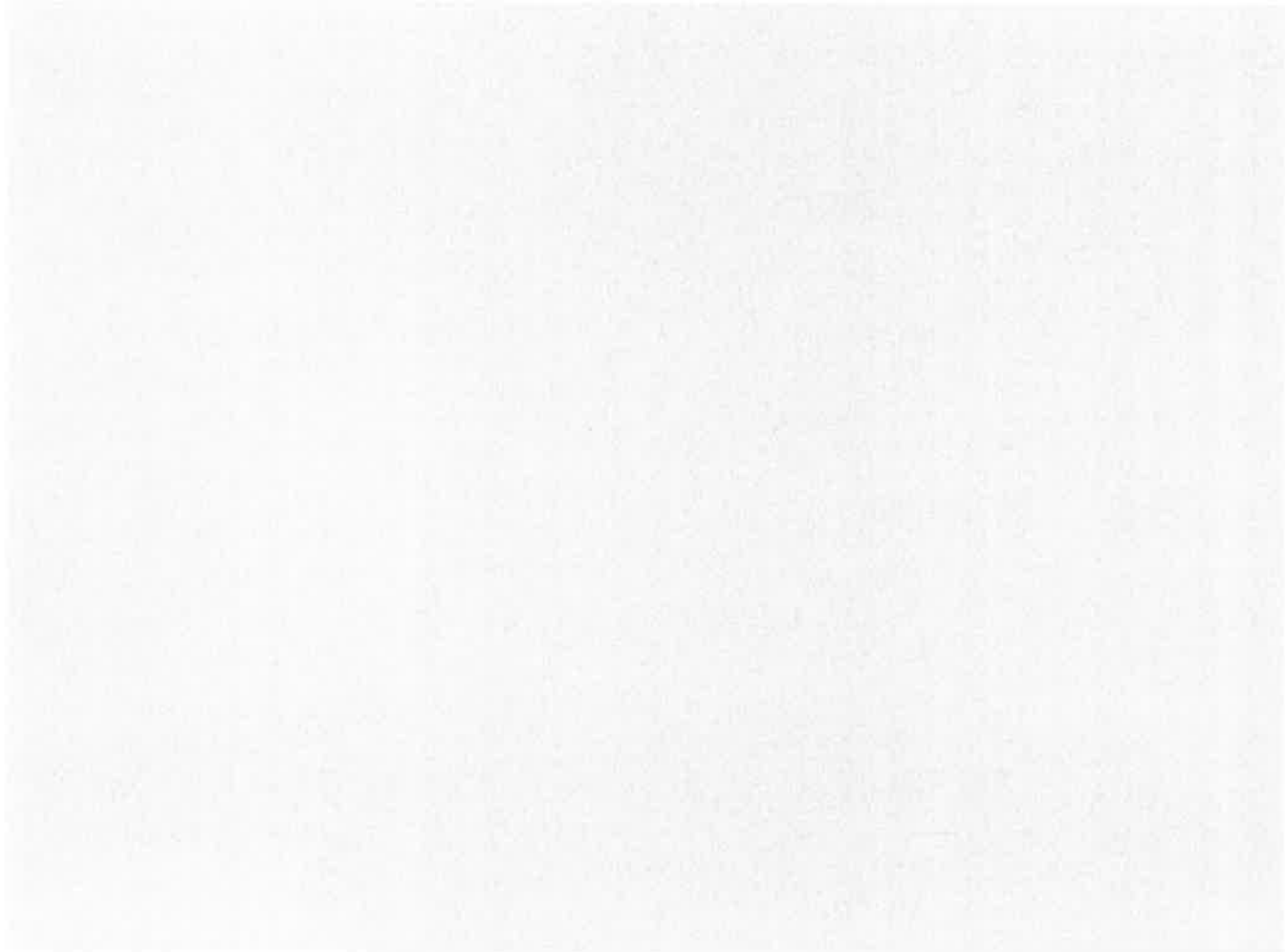
And Wells Fargo and the North American Development Bank sent in responses to the water finance authority offering their services in advising the state agency on financing such big projects, although they didn't propose a specific project. The development bank is a binational financial institution, established in 1994 by the U.S. and Mexican governments to provide financing to support the development and implementation of environmental infrastructure projects along the U.S.-Mexico border.

Backers of these projects have for years said Arizona needs to get going on supporting plans to build them, in part because of the lengthy periods needed to get them financed, permitted and built. Otherwise, the water won't be there when it's most acutely needed in a decade or two if continued growth and drying of the Colorado River pushes the state into a deep water crisis, advocates say.

Get "our water house in order" first

But in one response to the water authority, Arizona environmentalist Haley Paul urged a go-slow approach to big importation projects. She is Arizona policy director for Audubon Southwest.

"Broadly, Audubon believes that before we embark on large-scale and long-term projects to import water into Arizona from out of the state or out of the country, we must manage the water we already have more wisely," Paul wrote to the authority.



Since farms use up to 80% of the Colorado River Basin's water and about 72% of water consumed in Arizona, two big project proposals target farms for water savings they say could flow to city users or be saved in the Colorado River's depleted reservoirs.

Randy Hoeft, Yuma Sun file

“Currently, the state of Arizona does not manage groundwater supplies in more than 80 percent of the state, nor has it completed the General Stream Adjudications (which will determine who has the rights to what surface water in the state), nor have we updated the rules governing Active Management Areas for quite some time, nor have we settled water rights claims or come to agreement with 11 tribes in the state over water,” she wrote.

“Improving our water management and getting our water house in order must be acknowledged as a key component of securing our water future. We cannot simply add more water on top without addressing these underlying concerns.”

For augmentation, Audubon suggests focusing on in-state projects before looking for water elsewhere. These would include wastewater recycling, septic-tank-to-sewer conversions, groundwater recharge, advanced water purification, forest and watershed health, and improving existing infrastructure to increase water reliability.

How they would do it

Here are some of the ideas sent to the authority, including two major agricultural water-saving projects.

1. Yuma Desalination Plant retrofit, and then some. Deluge Technologies Inc., of the Phoenix area, is pushing for four desalination projects, including one to treat seawater piped up from the Gulf of California to the Yuma area. The total construction cost slightly exceeds \$2.75 billion.

It would retrofit the long-shuttered Yuma Desalination Plant. The plant, used only for testing since 1992, would be redesigned and rebuilt for what Deluge calls its Hydraulic Engine technology, powered by stored, solar thermal energy.

Deluge's project would buy and use hot water to energize its engines from the waste-heat of Arizona Public Service's Yucca Power Plant, which adjoins the inactive desalination plant. A redesigned plant would remove salt from groundwater and seawater at a lower cost than for desalting seawater using conventional technology, Deluge says.

Purified water would be sent by pipeline to the Buckeye area, where lack of available groundwater has stalled much of the planned new home development for a year now. The pipeline, or a separate one, would then take additional purified seawater to the Central Arizona Project canal near Phoenix, and could also be delivered to Tucson, Deluge said.

Deluge also wants the Arizona water authority to back his plans to build six, much smaller desalination “stations,” each purifying about 1 million gallons daily. They would treat very brackish groundwater known to be waterlogging existing aquifers in Buckeye and other Arizona areas of brackish groundwater.

Deluge cites estimates from Tucson-based water consultants Montgomery and Associates that more than 600 million acre-feet of recoverable brackish groundwater remain in Arizona aquifers. That’s nearly 90 times Arizona’s annual water use.

“When I found out that Buckeye is sitting on a massive underground aquifer full of salt water, it became a massive opportunity, because it’s water that we’re losing every day,” Deluge’s founder and CEO, Buckeye inventor Brian Hageman, **told the West Valley View newspaper.**

2. Three treatments in one package. Six companies, a nonprofit “business council” and the University of Arizona’s Water Resources Research Center teamed up to propose three separate projects.

One would combine stormwater capture and recharge near the Mexican border in Sonora, an upgraded Nogales International Wastewater Plant and a Sonora-based seawater desalination plant, built in five separate phases concluding with construction of the desal plant.

This project could more than double the Nogales Wastewater Treatment plant’s treatment capacity and supply up to 36,000 acre-feet of new water supplies, backers say, citing a study by one backer, Freeport McMoRan mining company. Freeport is interested in taking up to 11,000 acre-feet a year and Tucson Water is interested in taking up to 15,000 acre-feet a year to replace some of its CAP supplies, backers say.

This leaves 10,000 acre-feet a year for discharge to the Santa Cruz River for potential aquifer recharge and improved riparian habitat, backers say.

The project's capital and operating expenditures will be determined by which individual efforts are selected; however, Freeport has funding for an initial wastewater plant expansion project and is looking for partners for this regional development project.

The proposal is also supported by private equity interests, including Canadian pension funds and banking interests, and project partner Aqualia, which has significant Mexican operations, operating one seawater desalination facility in Sonora.

A second project would treat brackish groundwater in the Yuma, Buckeye and Winslow areas for drinking. A third would transport groundwater from the huge Harquahala Groundwater Basin in western Maricopa County to the water-short Buckeye area.

3. Saving ag water for the rest of us. Since farms use up to 80% of the Colorado River Basin's water and about 72% of water consumed in Arizona, two big project proposals target farms for water savings they say could flow to city users or be saved in the Colorado River's depleted reservoirs.

"There is an OCEAN OF WATER, hidden in plain sight, locked up in the noble mission of feeding us all. Agriculture accounts for 85% of the total water used," said one proposal, from a company called E2Eden.

"That cup of water the restaurants withhold during a drought? Performative sacrifice. Irrelevant. A rounding error. You see fields of alfalfa, we see a resource waiting to be unlocked," it says.

E2Eden's project involves creating what the company calls desalination farms. They would make use of huge, cellulose "desalination panels" that would be soaked by seawater or brackish groundwater. That would humidify and cool surrounding farmland, reducing farm water consumption by 90%, and moderating the climate and the presence of dust. The leftover brine wastewater would be placed into evaporation ponds, to eventually dissipate into open air.

This approach has been used at a \$100 million facility built in Australia by SundropFarms, that supplies 15% of that country's tomatoes, the company said.

Once a project like this has worked on a small scale, it can be ramped up, using large amounts of ocean water transported to major farmers in a place such as Southern California's Imperial irrigation District, backers say. This proposal contains only a cost estimate of \$2.9 million for the first phase of designing and building a desalination farm and conducting a study to demonstrate if the concept is valid.

The other idea is called "transpiration only irrigation." It comes from California-based Umida Agriculture.

Its founder and CEO, Joseph Gallegos, said it's using the technology on various farms across California. In the Imperial Valley in the Southern California Desert, "we are working with alfalfa growers to reduce water consumptions, through annual conservation rebates," Umida said.

The company places a specially designed aquifer pipe four feet underground, to create a virtual water table below crops. Areas in the pipe's "V" channel become fully saturated to a consistency of mud. Then, "the surrounding soil wicks up the moisture by capillary movement into the root zone for the plants."

"The irrigation operation is like dipping the tip of a paper napkin in a full glass of water, the napkin is going to wick the moisture up. Pull the napkin away from the water and the napkin will eventually dry out, till the napkin is dipped back in the water again," Umida said. "When a farm uses this infrastructure, the action is the same, the farm fills the pipe and lets the water wick up into the soil in a moisture plume and uptake by the crops roots in this moisture plume."

This project could cost \$500 million in government subsidies for each of two phases, the company said. The first phase would be used on about 25,000 acres, delivering 75,000 acre-feet of water annually for 100 years. The second \$500

million would cover the technology's use on about 200,000 acres, delivering an additional 600,000 acre-feet annually, the company said.

4. Restoring a dry lagoon and building a desal plant. That's the twin vision of the company Asset Investment Management LLC, whose chairman Ronald Newcomb is a former defense contractor and professor at San Diego State University's College of Science.

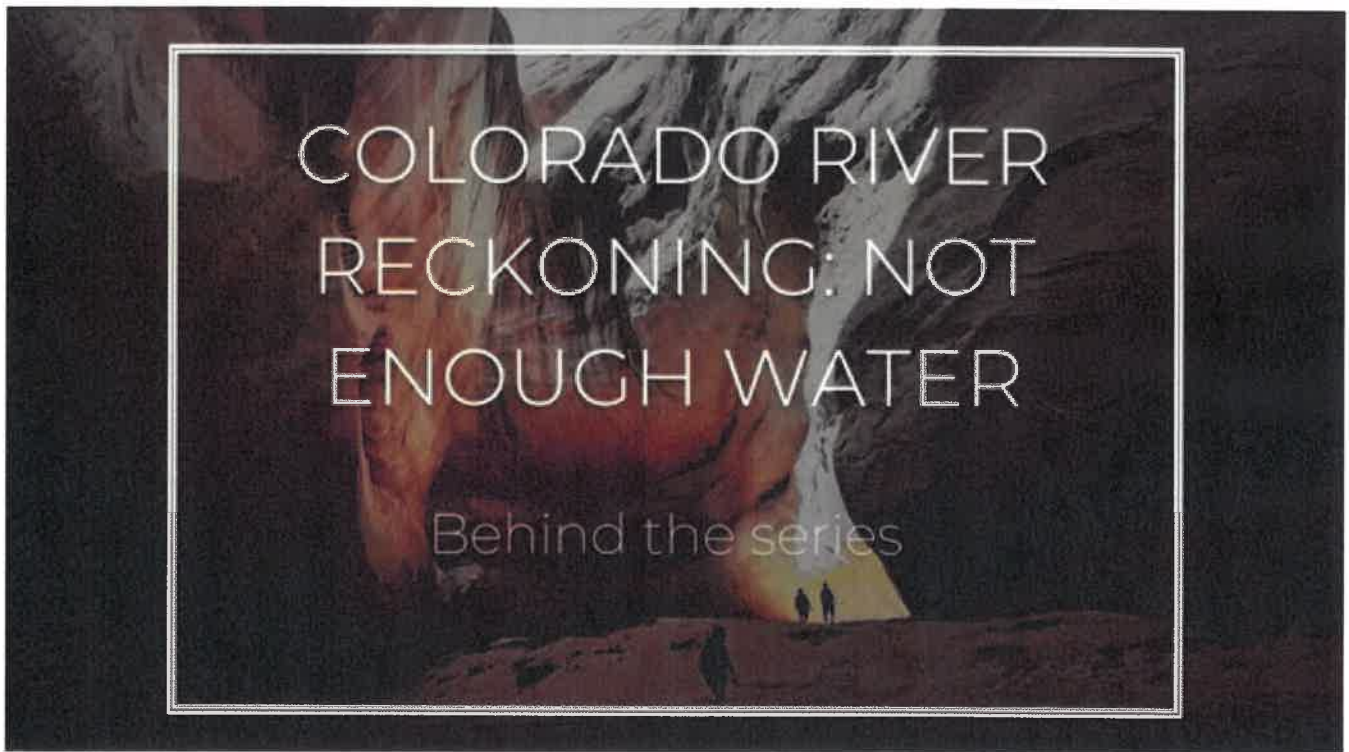
The company proposes to build a desalination plant at the northern tip of Laguna Salada, a once-flourishing, now usually dry lake just west of Mexicali, Baja California and just south of Calexico, California. It would build a 300-foot wide, open, unlined, 29-mile canal to take salty seawater from the Gulf of California to the lagoon. **A natural lake until drying up in the mid-20th century**, Laguna Salada spans 260 square miles.

"A century ago, Laguna Salada had a thriving fishery," said the Asset Investment Management writeup on its plan. "By managing the lagoon hydrology, Laguna Salada will be restored to its original condition, increasing the viable habitat area of the Sea of Cortez, and creating extensive wetlands on the western side where more than fifty square miles will be less than ten feet deep."

The desalination plant would use a technology known as Multiple Effect Distillation, or MED, to remove the salt, and produce about 400 million gallons of drinkable water daily, the company said. Newcomb describes it as "an evaporation/condensation technology where each 'effect' is a separate chamber, water evaporated from the feed and condensed in various chambers." It will be powered by renewable geothermal energy that exists in the area and use about one-third the energy use of a standard, reverse osmosis desalination plant, the company said.

The water would be transported to Arizona by pipeline, across northern Baja California, eventually crossing into Southern California, crossing El Centro, entering Arizona near Yuma and connecting to the Yuma Desalination Plant. A

pump station would lift the water further, and the company suggests transporting it to Phoenix along the Gila River bed to avoid disrupting roads.
No construction cost estimate is provided for the plant.



Longtime Arizona Daily Star reporter Tony Davis talks about the viability of seawater desalination and wastewater treatment as alternatives to reliance on the Colorado River.

Jesse Tellez

Contact Tony Davis at 520-349-0350 or tdavis@tucson.com. Follow Davis on **Twitter@tonydavis987**.

By Tony Davis

Reporter

CLIMATE / ENVIRONMENT / SCIENCE

Suck carbon out of the atmosphere and desalinate seawater at the same time? This startup is trying. / There's a new plan to suck planet-heating carbon dioxide out of the air while creating fresh water for petrochemical production.

By [Justine Calma](#), a senior science reporter covering climate change, clean energy, and environmental justice with more than a decade of experience. She is also the host of *Hell or High Water: When Disaster Hits Home*, a podcast from Vox Media and Audible Originals.

Jan 17, 2024, 11:44 AM PST | [0 Comments](#) / [0 New](#)



A mockup of an industrial plant layout for a facility that would desalinate seawater and take carbon dioxide out of the air. Image courtesy of Capture6

A startup developing technology to take planet-heating carbon dioxide out of the atmosphere just signed a deal with a state-owned water utility in South Korea to

build a pilot project that combines the new climate tech with seawater desalination. The first-of-its kind collaboration is intended to clean up some of the pollution from a giant hub for petrochemical production nearby, on top of supplying fresh water to heavy industries in the area.

Depending on how you look at it, partnerships like this could be an innovative way to minimize the environmental damage from very dirty business, or a way to keep fossil fuels flowing when the world needs cleaner alternatives. Either way, it's an example of how the fossil fuel industry is cozying up with emerging technologies, like direct air capture (DAC), which are supposed to fight climate change but also have skeptics worried about whether it might become a crutch for big polluters.

The first-of-its kind collaboration is intended to clean up some of the pollution from a giant hub for petrochemical production nearby, on top of supplying fresh water to heavy industries in the area

“We actually kind of agree with the critique that if you do a DAC project, and that makes you more water insecure, or more climate vulnerable, or if that perpetuates fossil fuels on the grid, that’s a problem,” says Luke Shors, president of the California and New Zealand-based climate tech startup Capture6 that inked the deal. “We actually think these projects can accomplish multiple climate goals, and that’s why we should pursue them.”

Shors’ company signed a memorandum of understanding (MOU) this week with South Korean water utility K-water and wastewater treatment company BKT. Together they’ll develop what they say is the world’s first fully integrated facility for carbon removal and water management using seawater desalination.

Capture6 plans to build Project Octopus, a carbon removal plant that it hopes will eventually remove hundreds of thousands of tons of carbon dioxide from the

atmosphere each year — a feat that a growing number of startups around the world are trying to achieve.

What's unique about Project Octopus is how it's expected to work in tandem with a plant that turns seawater into fresh water. One downside with desalination plants is that they produce salty brine that can be harmful when released into the surrounding environment. Capture6 instead uses that wastewater in its carbon removal process, extracting salt that it then uses as a feedstock for a liquid sorbent that reacts with CO₂ in the air.

The solution traps CO₂ which, after mixing with calcium, produces a limestone or chalk-like mineral that keeps the greenhouse gas from escaping back into the atmosphere. Fresh water is another byproduct of the process.

This is no silver bullet for climate change or drought, and these technologies come with their own costs. DAC and desalination plants both use a lot of energy. And since the pilot facility will be plugged into the grid, that means it will still be powered largely by fossil fuels and generating the same greenhouse gas emissions Project Octopus is meant to clean up.

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Moreover, the facility is essentially being built to service the Daesan Industrial Complex that produces 40 percent of South Korea's petrochemicals derived from oil and gas. "[The industrial complex] will exist, right? No matter what we do. So I think that's why it's very important for us to be at the same time realistic," says Leo Park, vice president of strategic development at Capture6. "I think it's important for us to reduce their carbon footprint any way we can."

If it's ultimately able to grow into a commercial-scale facility, Project Octopus could capture up to 500,000 metric tons of CO₂ annually once fully completed. The pilot facility is supposed to draw down just 500 metric tons of atmospheric carbon

dioxide a year, and the MOU also includes plans to filter another 500 metric tons of CO2 from smokestacks before it's released into the atmosphere.

Altogether, that's just a fraction of the 17 million metric tons of carbon dioxide Daesan pumps out each year. And to reach global goals of stopping climate change set under the Paris Agreement, polluters need to slash their CO2 emissions in half this decade. The plan at Project Octopus is to start construction on the \$2-3 million pilot this year, but breaking ground on a potentially \$100-200 million commercial facility might not happen until late 2026 at the earliest.

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