



Why is **Pure Water San Diego** Being Implemented?

San Diego relies on importing 85% of its water supply from the Colorado River and Northern California Bay Delta. The cost of this imported water has tripled in the last 15 years and continues to rise. With limited local control over its water supply, the City of San Diego is more vulnerable to droughts, climate change, and natural disasters.

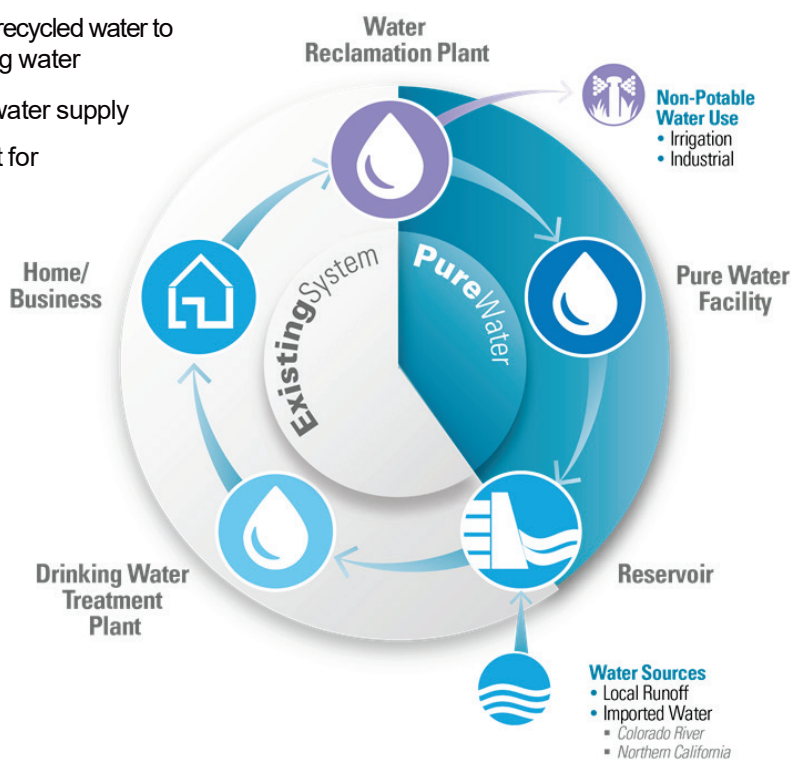
What is **Pure Water San Diego**?

Pure Water San Diego is a phased, multi-year program. Based on water use projections developed in 2020, the Pure Water Program will provide nearly 1/2 of San Diego's water supply locally by 2035. The Pure Water Program:

- Uses proven technology to clean recycled water to produce *safe, high-quality* drinking water
- Provides a *reliable, sustainable*, water supply
- Offers a *cost-effective* investment for San Diego's water needs

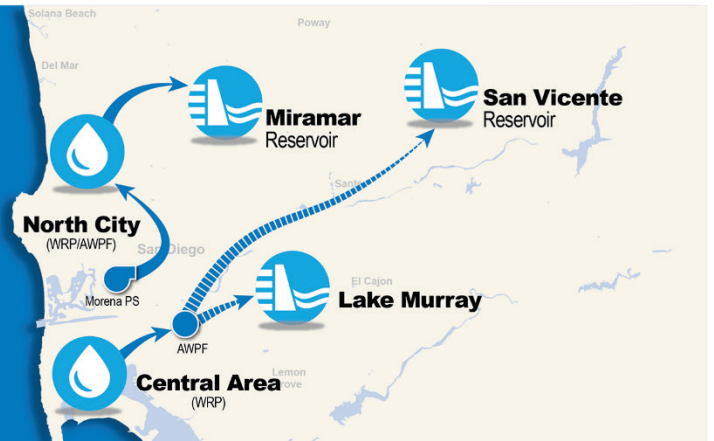
How Does the **Pure Water Program** Work?

With San Diego's existing water system, only 8% of the wastewater leaving homes and businesses is recycled; the rest is treated and discharged into the ocean. The Pure Water Program transforms the City's water system into a complete water cycle that maximizes our use of the world's most precious resource—water.



Where is the Pure Water Program?

The Pure Water facilities will be located in two different geographical areas: North City (Phase 1) and Central Area (Phase 2).



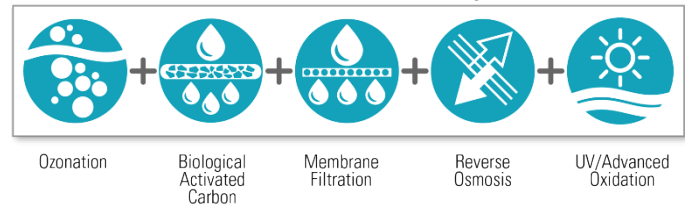
When will the New Facilities be Built?

Phase 1	30 mgd by 2025	North City
Phase 2	Additional 53 mgd by 2035	Central Area

Total 83 mgd

*mgd = million gallons per day

What are the Steps of the Water Purification Process?



Since June 2011, the City has produced 1 million gallons of purified water every day at its Pure Water Demonstration Facility.

More than 50,000 water quality tests have confirmed the water is safe and meets all federal and state drinking water standards.



Did you Know?

The Pure Water Program is the largest integrated infrastructure program the City of San Diego has undertaken and will be the first reservoir augmentation project in California.

What will the New Facilities Cost?

Phase 1 of the Pure Water Program will cost \$1.5 billion for planning, design, and construction. Phase 2 costs are currently being prepared.



Local **residents**, community **groups**, environmental **organizations**, and local **businesses** support the **Pure Water Program**.

Do you **support Pure Water**? Like us, follow us:



@PureWaterSD

Want to Know More?

Visit PureWaterSD.org to sign up for a presentation or take the virtual tour of the Pure Water Demonstration Facility.



What is Pure Water San Diego?

Pure Water San Diego is the City of San Diego's (City) program that will provide nearly one-half of San Diego's water supply locally by 2035. The Pure Water Program will include a system of treatment facilities, pump stations and pipelines that will be constructed in multiple phases and will:

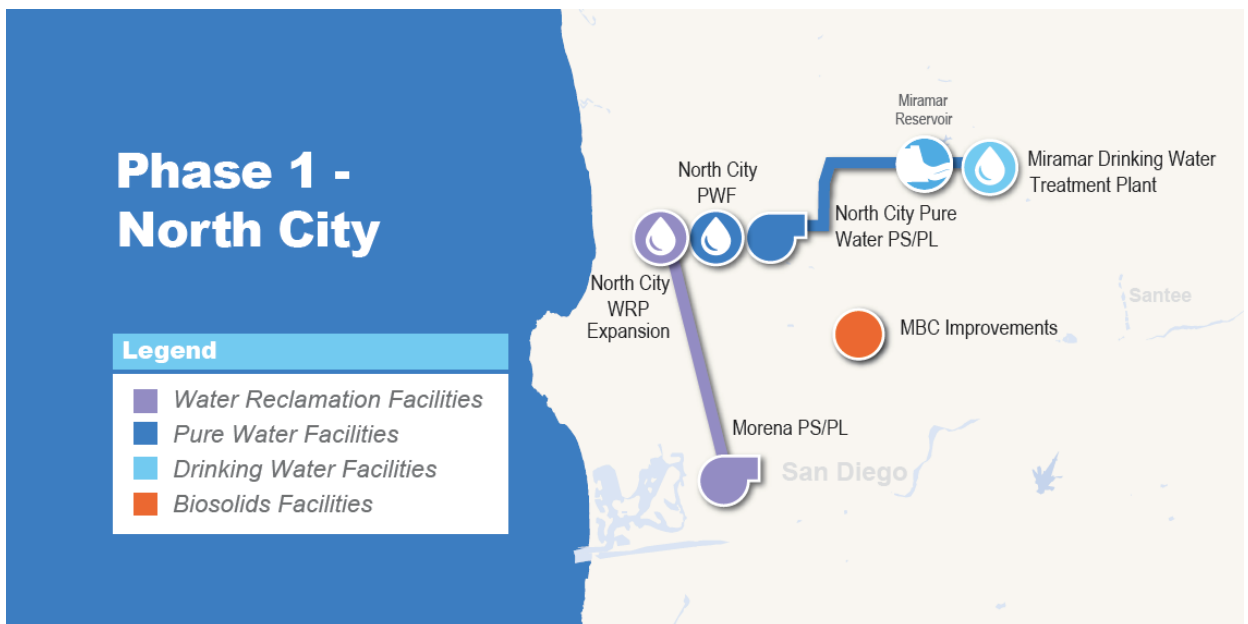
- Use proven technology to clean recycled water to produce safe, high-quality water
- Provide a reliable, sustainable water supply; and
- Offer a cost-effective investment for San Diego's water needs.

Phase 1	30 mgd by 2025	North City
Output		Location
Phase 2	Additional 53 mgd by 2035	Central Area
Total 83 mgd		

*mgd = million gallons per day

What does Phase 1 Include?

The Pure Water Program is the largest integrated infrastructure program the City of San Diego has ever undertaken. Phase 1 - North City is comprised of several projects that will deliver 30 million gallons per day (mgd) of purified water for San Diego. The purified water will be piped to the Miramar Reservoir for storage and then will be treated again at the Miramar Drinking Water Treatment Plant and distributed to the public. The projects under construction as part of Phase 1 include the Morena Pump Station and Pipelines, the North City Water Reclamation Plant Expansion, the North City Pure Water Facility and Pump Station, the North City Pure Water Pipeline, and Metropolitan Biosolids Center improvements. A detailed map of the project locations can be viewed online at phase1.purewatersd.org.



Morena Pump Station and Pipelines

This project will transport up to 32 mgd of wastewater to the North City Water Reclamation Plant (NCWRP), where it will be treated before being sent to the new North City Pure Water Facility (NCPWF) for further purification. Construction will include a new pump station on Sherman Street and two parallel 10.7-mile-long wastewater pipelines. One pipeline will transport wastewater to the NCWRP, while the other will transport salt and contaminants removed during the water purification process at the NCPWF to the Point Loma Wastewater Treatment Plant. The wastewater pipelines will start at Sherman Street, follow West Morena Boulevard to Clairemont Drive, continue to Genesee Avenue and go through University City to the NCWRP on Eastgate Mall. This project will also include the construction of two approximately 3.5-mile water pipelines, a 16-inch water distribution pipeline, and a 36-inch water transmission pipeline, which will run parallel to the wastewater pipelines along West Morena Boulevard and Morena Boulevard.

NCWRP Expansion

This project will increase the amount of recycled water the NCWRP produces. The NCWRP is located on Eastgate Mall and treats wastewater to recycled water standards for irrigation and industrial uses. The plant capacity will increase from 30 mgd to 52 mgd to continue to meet non-potable water demands, as well as supply the NCPWF. A new pump station located at the NCWRP will convey up to 42 mgd of recycled water to the new NCPWF across the street for further purification.

NCPWF and Pump Station

A new Pure Water Facility will be built on Eastgate Mall across the street from the existing NCWRP to clean the recycled water further to produce 30 mgd of safe, high-quality water that meets all state and federal drinking water standards. The NCPWF will use the proven five-step water purification process of ozonation, biological activated carbon filters, membrane filtration, reverse osmosis, and ultraviolet disinfection with advanced oxidation.

North City Pure Water Pipeline

This project will transport purified water produced at the NCPWF to Miramar Reservoir. A new pump station will be constructed next to the NCPWF on Eastgate Mall along with an 8.4-mile pipeline that will convey approximately 30 mgd of purified water to Miramar Reservoir. The pipeline will start on Eastgate Mall, follow Miramar Road, and continue through Scripps Ranch and end in the Miramar Reservoir.

Metropolitan Biosolids Center (MBC) Improvements

MBC is the City's regional biosolids facility that receives and processes solids from both the NCWRP and the Point Loma Wastewater Treatment Plant. To accommodate the increase in flows and loadings that will result from the NCWRP expansion, this project involves upgrades at MBC including equipment replacements and improvements to grit removal, biosolid thickening, anaerobic digestion, biogas handling, and the centrate pump station.

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Do you **support Pure Water**? Like us, follow us:



@PureWaterSD

Want to Know More?

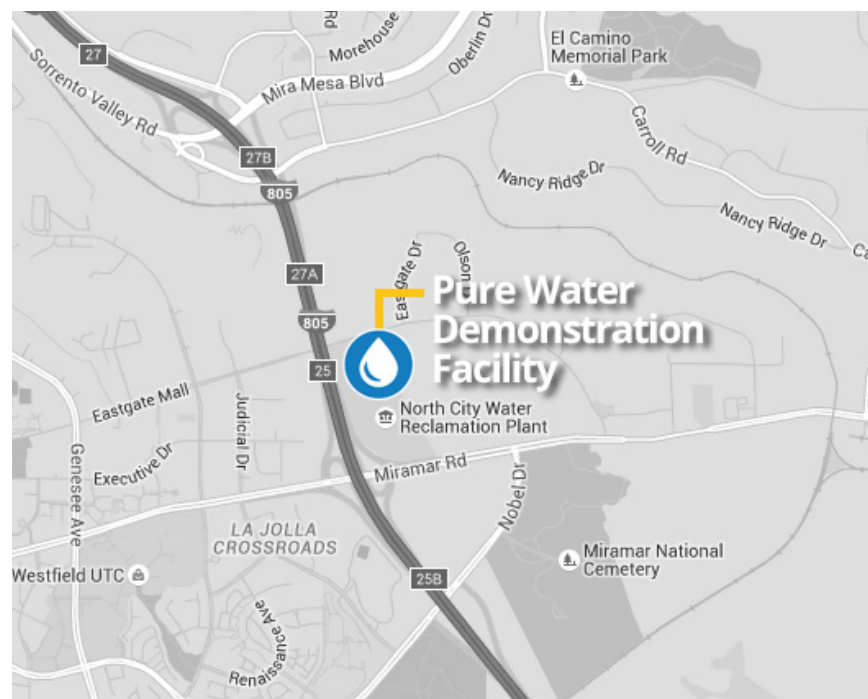
Visit purewatersd.org to sign up for a free tour of the Pure Water Demonstration Facility or request a presentation for your organization.





The NCPWF will produce 30 million gallons of purified water per day. Learn more about the City of San Diego's Pure Water Program at www.purewatersd.org.

Request a presentation about Pure Water San Diego for your group or organization at presentations.purewatersd.org or call (619) 533-7572.



Tasting is **Believing**

You are invited to tour the Pure Water Demonstration Facility. During the walking tour, you will see and learn about each step of the water purification process up close and have the opportunity to taste the purified water produced at the facility.

The Pure Water Demonstration Facility is located at the North City Water Reclamation Plant at 4949 Eastgate Mall, San Diego, CA 92121. Register for a public tour at www.purewatersd.org/tours or call (619) 533-7572.

Want to **know more?**

Visit www.purewatersd.org and sign up for a free tour of the Pure Water Demonstration Facility!



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**Pure Water
San Diego**

The City of
SAN DIEGO

A look at the technology behind

**SD Pure Water
San Diego**

*A safe, reliable and sustainable
drinking water supply for San Diego*

Innovation for San Diego's Water Future

Pure Water San Diego is the City's phased, multi-year program that uses proven water purification technology to clean recycled water to produce safe, reliable, high-quality water. Pure Water will provide 1/3 of San Diego's water supply locally by 2035.

The Purification Process

The Pure Water Demonstration Facility began operating in June 2011 and purifies one million gallons of recycled water every day. Water quality tests have confirmed the purified water produced meets all federal and state drinking water standards. The facility's water purification process uses a multi-barrier approach of consecutive treatment steps which work together to remove or destroy contaminants. Each barrier includes frequent and continuous water quality monitoring, and safeguards are built into the process to ensure public health protection. Here is a look at the process, which starts with recycled water that is clean enough to be used for irrigation and industrial purposes:

The Process

Barrier 1
Ozonation



Ozone is a gas produced by subjecting oxygen molecules to high electrical voltage. The ozone gas is infused into the water and the water travels through a long series of pipes, called the ozone contactor. The ozone destroys microorganisms and reacts with and breaks down contaminants in the water. Prior to the next step, the ozone is consumed and breaks down into oxygen.

Barrier 2
**Biological
Activated Carbon
Filters**



Biological activated carbon (BAC) filters are filled with carbon granules covered in "aerobic" bacteria, which thrive in the presence of oxygen. The bacteria on the granules consume 30-50% of the organic matter (anything that is or was living). The "helpful" bacteria, along with any other bacteria still in the water, are removed in the next treatment step.

Barrier 3
**Membrane
Filtration**



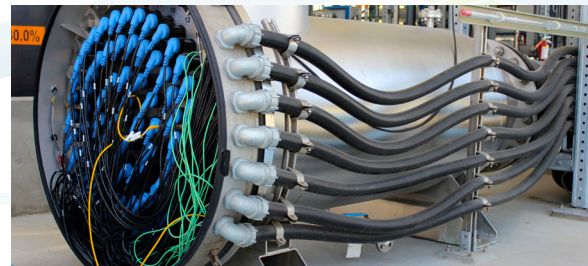
Membrane filtration uses canisters filled with straw-shaped hollow fibers that provide 99.99% removal of microscopic particles including suspended solids, bacteria and protozoa. The filters are tested daily to confirm their consistent removal of contaminants. The pores in the fibers are smaller than 1/300 the diameter of a human hair.

Barrier 4
Reverse Osmosis



Reverse osmosis uses high pressure to force water through spirally wound membranes that remove most salts and minerals, and 99% of dissolved organics, including pharmaceuticals and personal care products. This process is used by the bottled water industry.

Barrier 5
**Ultraviolet
Disinfection/
Advanced
Oxidation**



Inside a reactor are 72 ultraviolet lights that break down the DNA of any microbes or viruses. At the same time, advanced oxidation generates powerful reactive molecules that oxidize and destroy any trace contaminants that may remain in the water.

San Diego is among many innovative agencies implementing water purification technology to provide a safe, reliable and sustainable drinking water supply.

2020



Year in Review Report

The City of San Diego's Pure Water Program geared up for Phase 1 construction and had some notable successes with regulatory approvals and additional program funding this year. Due to the COVID-19 pandemic, outreach activities were mostly conducted virtually, and community engagement required innovative new ideas and platforms. This report provides a snapshot of the City's Pure Water accomplishments and activities that took place in 2020.

What is **Pure Water San Diego**?

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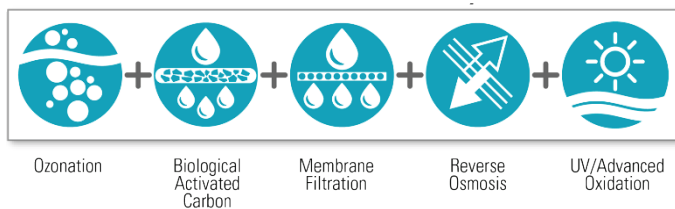
The Pure Water Program:

- Uses proven technology to clean recycled water to produce *safe, high-quality* drinking water
- Provides a *reliable, sustainable* water supply
- Offers a *cost-effective* investment for San Diego's water needs

How Does the **Pure Water Program** Work?

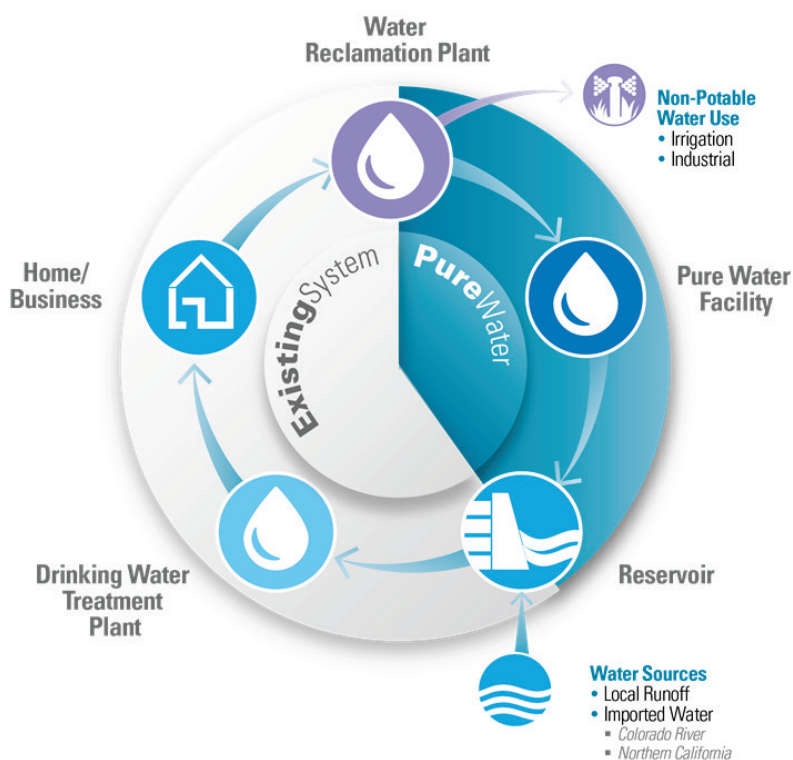
With San Diego's existing water system, only 8% of the wastewater leaving homes and businesses is recycled; the rest is treated and discharged into the ocean. The Pure Water Program transforms the City's water system into a complete water cycle that maximizes our use of the world's most precious resource—water.

What are the **Steps** of the **Water Purification Process**?



Since June 2011, the City has produced 1 million gallons of purified water every day at its Pure Water Demonstration Facility.

More than 50,000 water quality tests have confirmed the water is safe and meets all federal and state drinking water standards.



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Program Milestones

May 2020

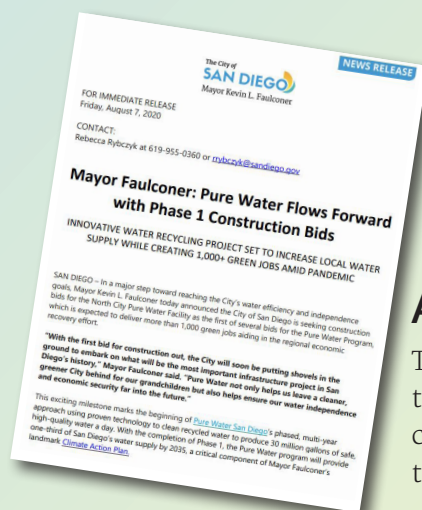
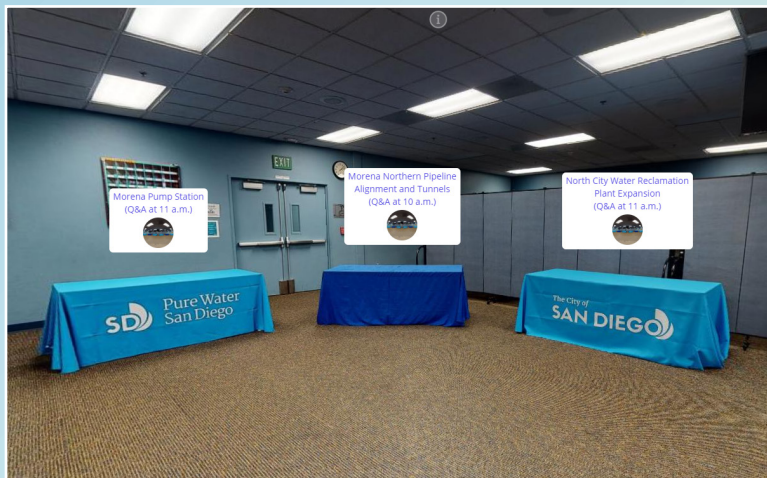
The San Diego Water Board formally adopts the National Pollutant Discharge Elimination System (NPDES) permit that allows purified water to be released into Miramar Reservoir (scheduled to occur in 2025).

June 2020

The U.S. Bureau of Reclamation awards the City \$1.16 million in funding for Pure Water as part of the bureau's statewide Title XVI project funding.

July 2020

The California Department of Water Resources awards the City \$1.14 million in grant money for Pure Water.



August 2020

The City advertises the first two Phase 1 construction packages to potential contractors.

September 2020

The City refinances its Water Infrastructure and Finance Act (WIFIA) loan at a lower interest rate.

October 2020

The Pure Water Demonstration Facility Virtual Tour is promoted as an alternative to in-person tours.

November 2020

The U.S. House of Representatives passes the Ocean Pollution Reduction Act (OPRA) II, a bill that simplifies the permitting process for the Point Loma Wastewater Treatment Plant based on the implementation of the Pure Water Program (the Senate has not yet acted and it will need to be reintroduced in the House).





Pure Water Public Outreach

(Pre-COVID tour and event photos)

Community Outreach

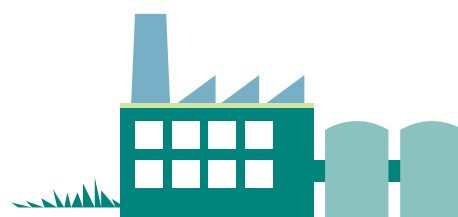
From January through mid-March 2020, tours of the Pure Water Demonstration Facility were held for over 100 participants, mainly from a variety of water-focused agencies and organizations, including the Metropolitan Water District of Southern California, the American Water Works Association Technical and Educational Council, and the San Diego Chamber of Commerce Sustainability and Infrastructure Committee.

The Pure Water team participated in two annual community cultural celebrations, the San Diego Tet Festival and the San Diego Chinese New Year Fair, and demonstrated how San Diego's water purification works at STEM field trips for elementary school students. Over 300 students interested in STEM (Science, Technology, Engineering and Math) fields visited the Pure Water booth at the Fleet Science Center High Tech Fair in February.



Public Outreach Program Highlights To Date (2010 - 2020)

More than **18,700** people have toured the Pure Water Facility.



790

Community Presentations



284

Community Events

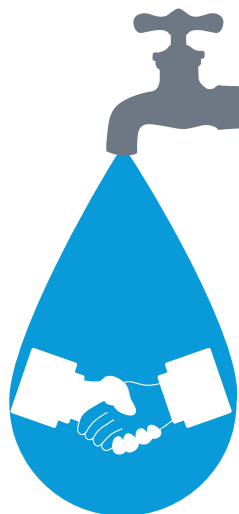
417

Stakeholder Interviews



4,879

Support Pledges from San Diegans



157,250 website visits

2020 Virtual Outreach & Engagement

more than **2,200** views
of the **Virtual Tour** of the
Pure Water Demonstration Facility.



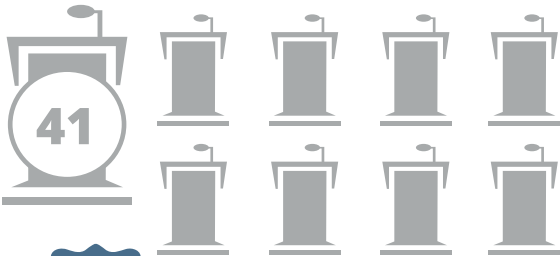
Over

250
contractors

at the Virtual
Contractor Expo

Virtual Presentations to more than

800 **Community**
members



17,080
website visits

25
Stakeholder
Interviews



Nearly
60 **support**
pledges
from San Diegans



9



youth lesson plans/toolkits
distributed to local educators

Virtual Community Engagement

Virtual Community Outreach

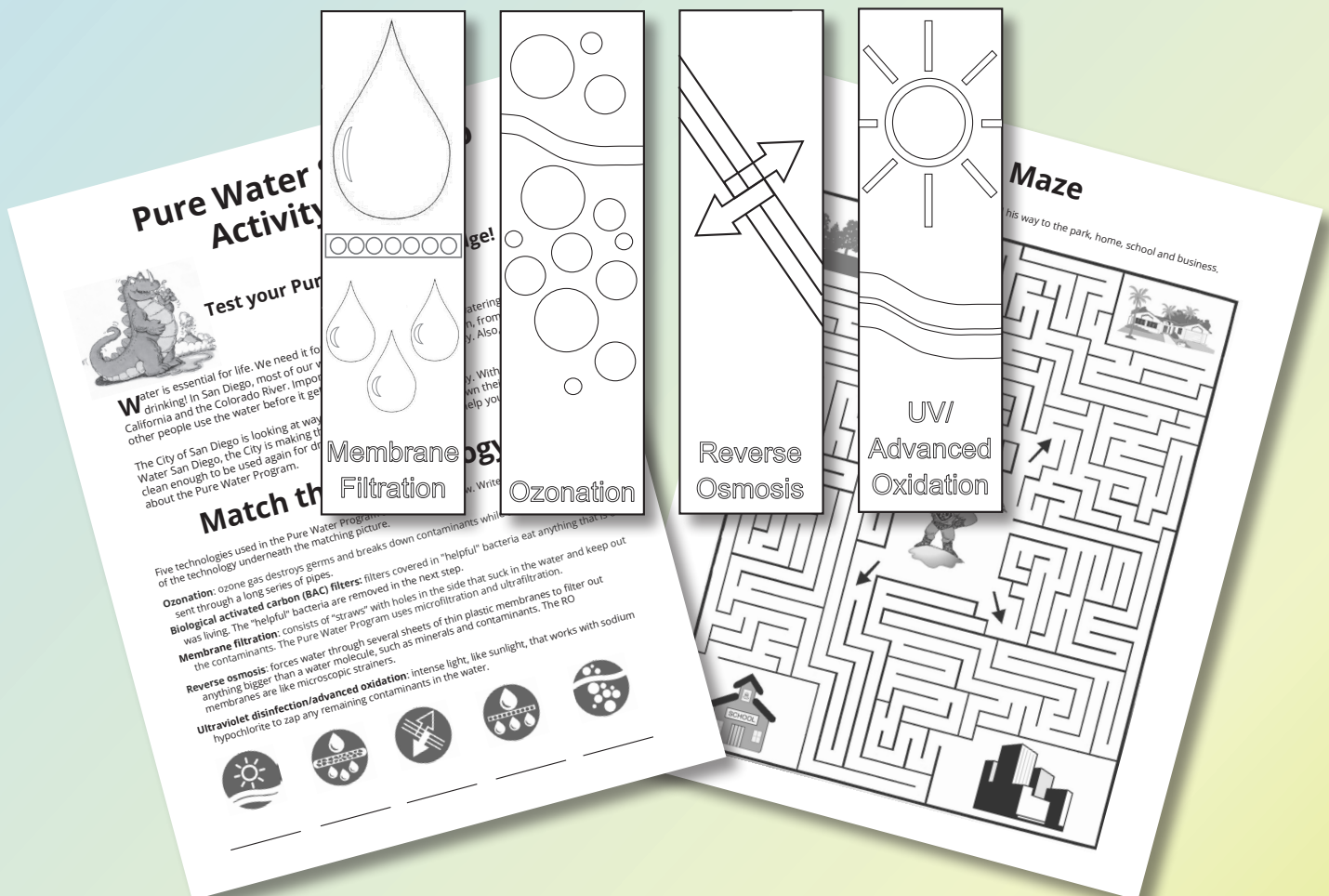
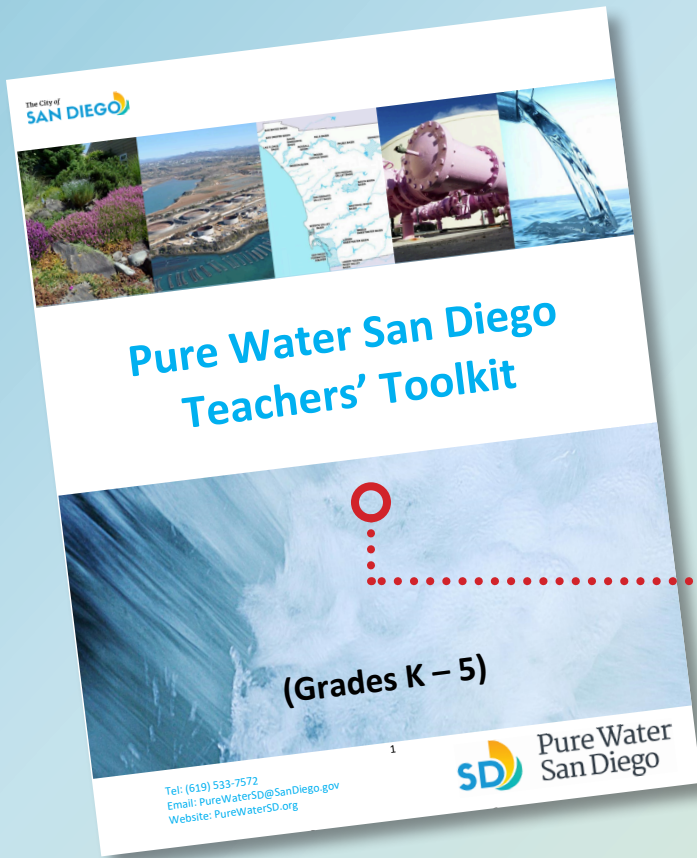
With in-person activities no longer possible due to the COVID-19 pandemic, from mid-March, all outreach for the Pure Water Program was conducted virtually.

Virtual Presentations

More than 40 virtual presentations were held via Zoom, Microsoft Teams, and other platforms in 2020 for planning groups, community organizations, and elementary, high school, and college classes. Presentations were tailored to specific areas of interest for each group on topics including regulations, water quality, design engineering, and more.

Digital Educational Toolkits

As a new way to provide Pure Water Program information to students, lesson plan toolkits were developed with information about San Diego's water supply and the technology behind the water purification process. There are two versions of the toolkit, one for grades K-5 and another for grades 6-12. The toolkits have been distributed to nine educators and continue to be promoted to teachers.





Pure Water Demonstration Facility Virtual Tour

Pure Water Demonstration Facility Virtual Tour

After completing filming in early 2020, the Pure Water team released a virtual tour of the Pure Water Demonstration Facility in October as an alternative to in-person tours. While the virtual tour was initially meant to provide an opportunity for community members to see the water purification technology up close during times when Phase 1 construction made tours of the demonstration facility more infrequent, it became even more important and timely during the pandemic. The 10-minute video follows City Pure Water staff as they lead viewers through each of the five steps of the advanced water purification process and provide information about Phase 1 of the Program.

[View the Pure Water San Diego Virtual Tour](#)

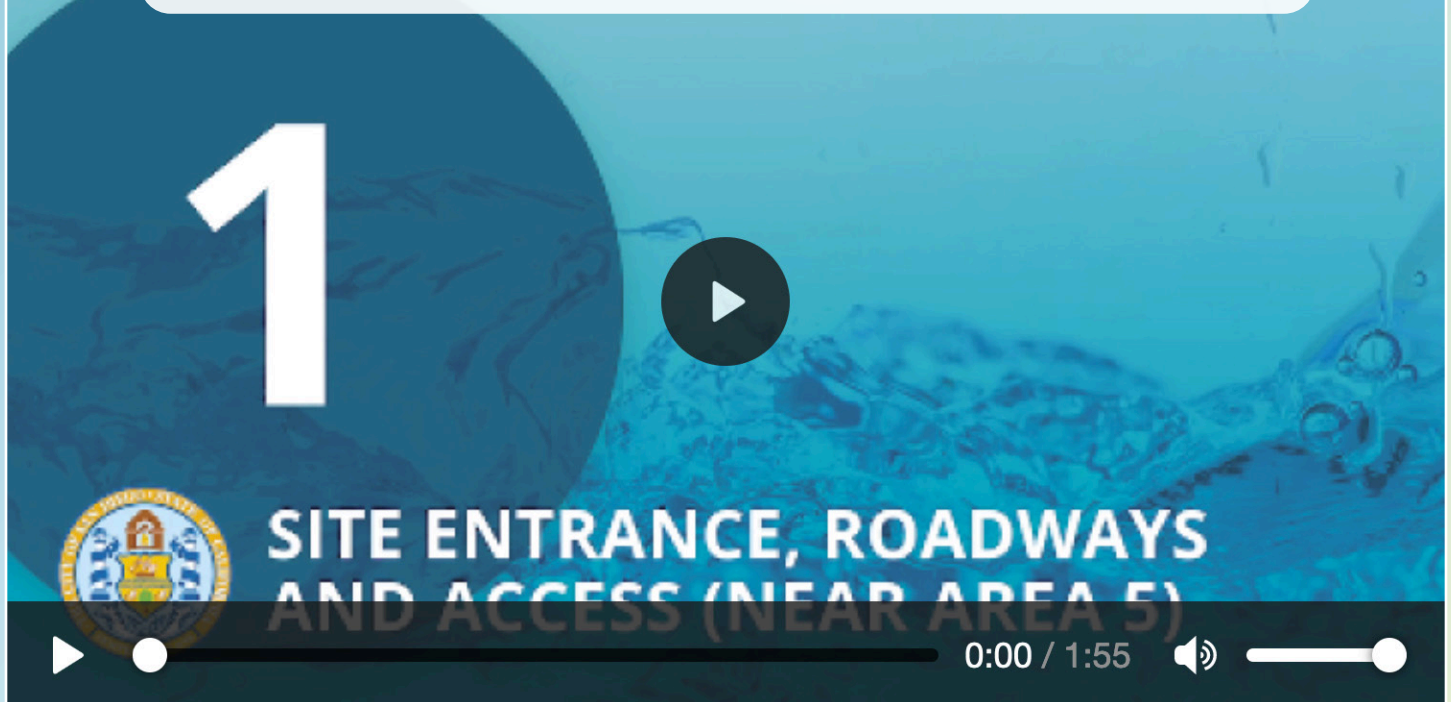


[Click here to view the Pure Water Facility Virtual Tour.](#)



Phase 1 Construction Activities

[Click here to view the Site Entrance, Roadways and Access video.](#)

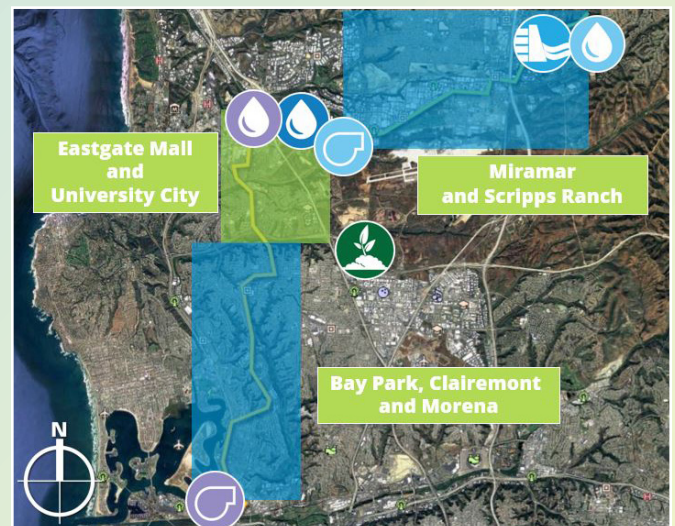


Phase 1 Construction Outreach

The Pure Water team continued to engage the four Phase 1 Community Working Groups in 2020 by providing periodic updates on the program and construction status. The Bay Park/Morena and Clairemont Working Groups participated in a virtual meeting on Aug. 26 to receive an update about their recommendations that were under review from the previous meeting, construction impacts in their communities, and the project construction timeline.

Early Site Work

Over the course of 2020, work continued at the North City Water Reclamation Plant (NCWRP) and the future North City Pure Water Facility (NCPWF) sites in preparation for Phase 1 construction. The NCWRP is being expanded to provide the necessary source water for the NCPWF. The early site work has focused on the areas where expanded components of the system are required to accommodate the additional daily water flow. Construction crews have graded the future NCPWF site and installed the necessary stormwater and sewage connections for the facility prior to the start of construction.



PHASE 1 CONSTRUCTION PACKAGES

Bay Park, Clairemont and Morena

- Morena Pump Station
- Morena Southern Pipelines
- Morena Middle Pipelines

Eastgate Mall and University City

- Morena Northern Pipelines and Tunnels
- NCWRP Expansion
- NCPWF and Pump Station
- Metro Biosolids Center Improvements

Miramar and Scripps Ranch

- North City Pure Water Pipeline, Dechlorination Facility and Subaqueous Pipeline



Virtual Contractor Expo and Bid Advertisements

2020 Virtual Contractor Expo

On July 28, over 250 prime contractors and subcontractors participated in the 2020 Pure Water San Diego Virtual Contractor Expo to learn about the Phase 1 construction packages, the bidding process, and how to do business with the City. The goal was to mirror the experience attendees would have at an in-person event, where they would hear opening remarks and then have the chance to visit booths about each construction package and speak in real time with the project managers. Using a combination of Zoom Webinar for the introductory presentations and the digital platform SeekBeak for the virtual “booths,” Expo attendees were able gather information about the six Phase 1 projects bidding in 2020. ***Click the video below to see a simulation of the virtual expo.***

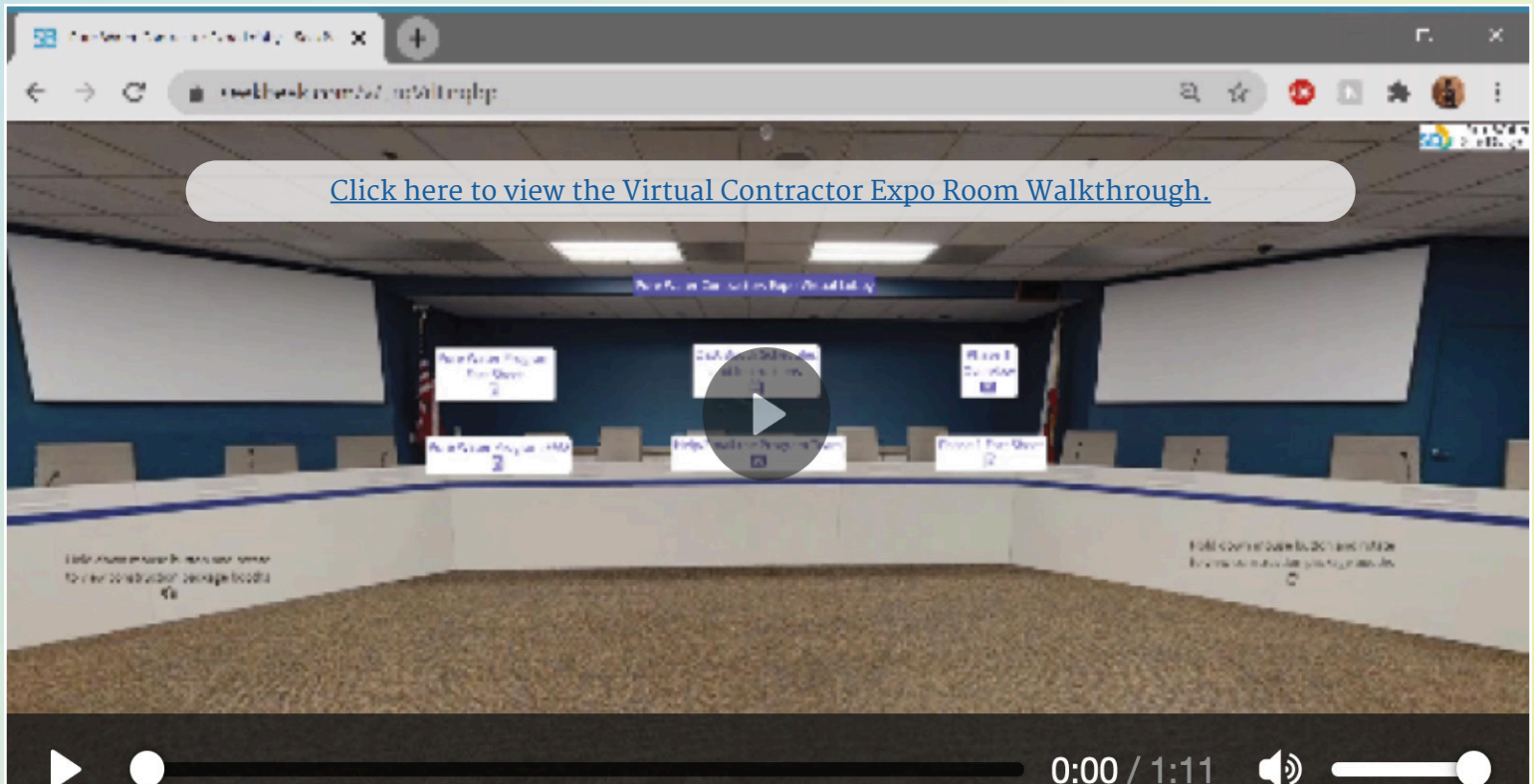


Bid Advertisements

In August, the City advertised the first two Phase 1 construction packages (the North City Pure Water Facility and Pump Station; and the Morena Northern Pipelines and Tunnels) for bidding by interested contractors. Four additional packages were also advertised in 2020, including the Morena Pump Station and NCWRP expansion. For the NCWRP expansion, the contractors were provided a link to view a drone site tour of the facility for their reference when putting together their bids. ***(see video on previous page)***



[Click here to view the Virtual Contractor Expo Room Walkthrough.](#)



Regulatory Achievements

NPDES Permit

On May 13, the San Diego Regional Water Quality Control Board adopted an order that grants the City of San Diego permission to add purified water to the Miramar Reservoir for Phase 1 of the Pure Water Program. The National Pollutant Discharge Elimination System (NPDES) permit contains limits on what can be discharged, monitoring and reporting requirements, and other provisions to ensure water quality and public health. San Diego's is the first NPDES permit issued for a reservoir augmentation project in the state of California.

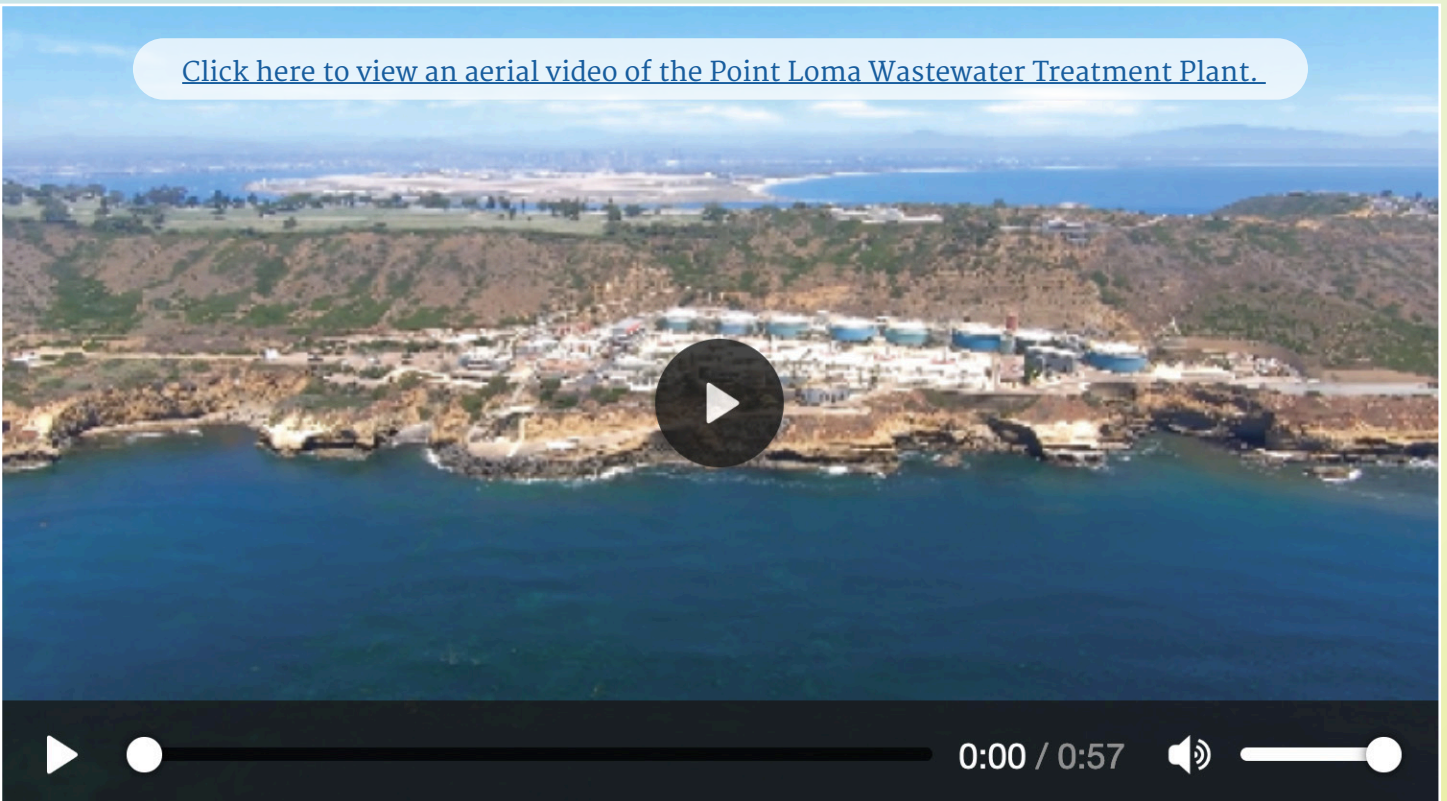
Miramar Reservoir is a key part of Phase 1 of the Pure Water Program. By 2025, the reservoir will store enough purified water to add 30 million gallons per day (mgd) to San Diego's drinking water supply.



OPRA II

In November, the U.S. House of Representatives passed a bill sponsored by U.S. Rep. Scott Peters called the Ocean Pollution Reduction Act II (OPRA II) which modified the permitting requirements for Point Loma Wastewater Treatment Plant's (PLWTP) ocean water discharge. While the City achieves the necessary contaminant removals from the treated water before discharging into the ocean, a waiver is required every five years in lieu of upgrading the PLWTP. Rather than upgrading the PLWTP, the wastewater flows will be redirected and recycled at the North City Water Reclamation Plant before receiving advanced purification at the North City Pure Water Facility. The U.S. Senate will still need to vote on the bill, and the House will have to vote again.

[Click here to view an aerial video of the Point Loma Wastewater Treatment Plant.](#)

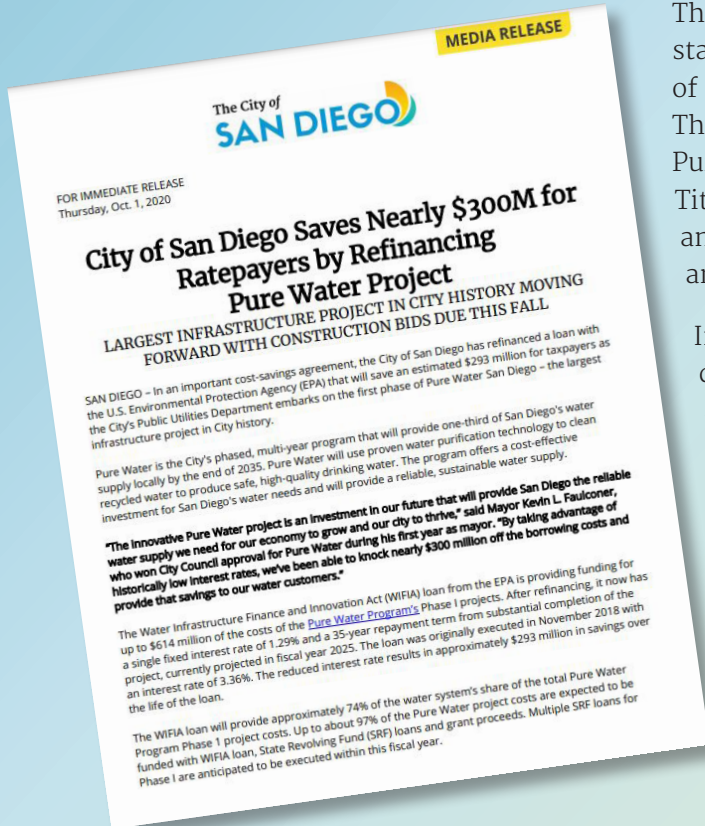


Program Funding

The Pure Water Program continued to secure funding from the state and federal government in 2020, as well as restructure some of the existing loans to scale back on the overall program costs. The Bureau of Reclamation awarded the City \$1.16 million for the Pure Water Program in June when it distributed its funding for Title XVI projects statewide. These projects focus on reclamation and reuse programs that increase water management flexibility and make water supplies more reliable.

In July, the California Department of Water Resources distributed \$15 million in grant money to water recycling and reuse programs in Southern California. The Pure Water Program was awarded \$1.14 million for construction on the North City Pure Water Facility Influent Pump Station and the outgoing conveyance pipeline.

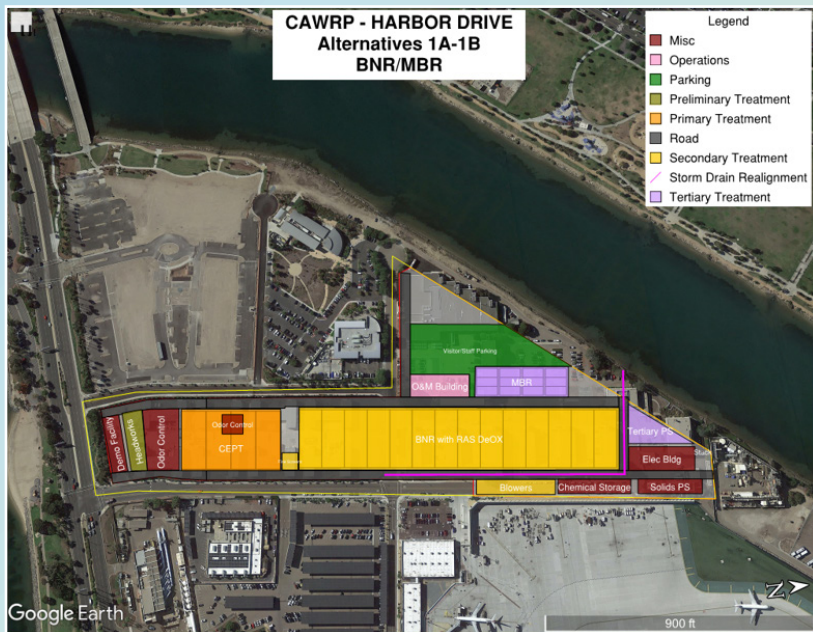
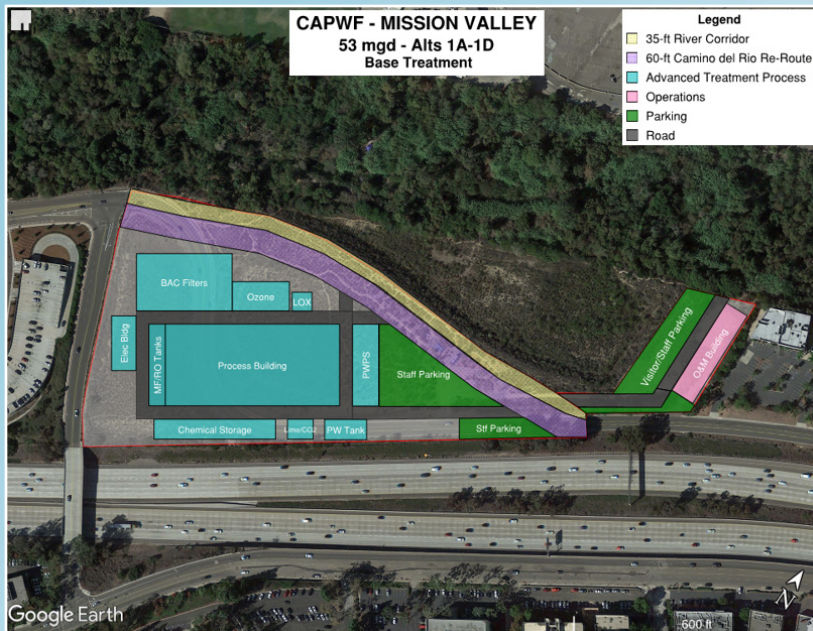
In November 2018, the City of San Diego was awarded \$614 million by the U.S. Environmental Protection Agency through the Water Infrastructure Finance and Innovation Act (WIFIA) loan to help fund the Pure Water Program. In September 2020, the WIFIA loan percentage rate was renegotiated to save San Diegans an estimated \$293 million over the course of the loan.



Funding Sources Have Been Secured

\$614M	Federal WIFIA loan
\$646M	State Revolving Fund loan
\$286M	MWD Local Resources Program [\$340/AF for 25 years]
\$30M	State grants

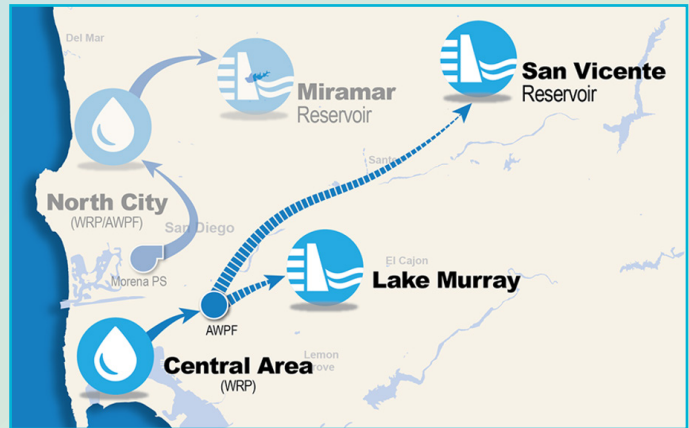




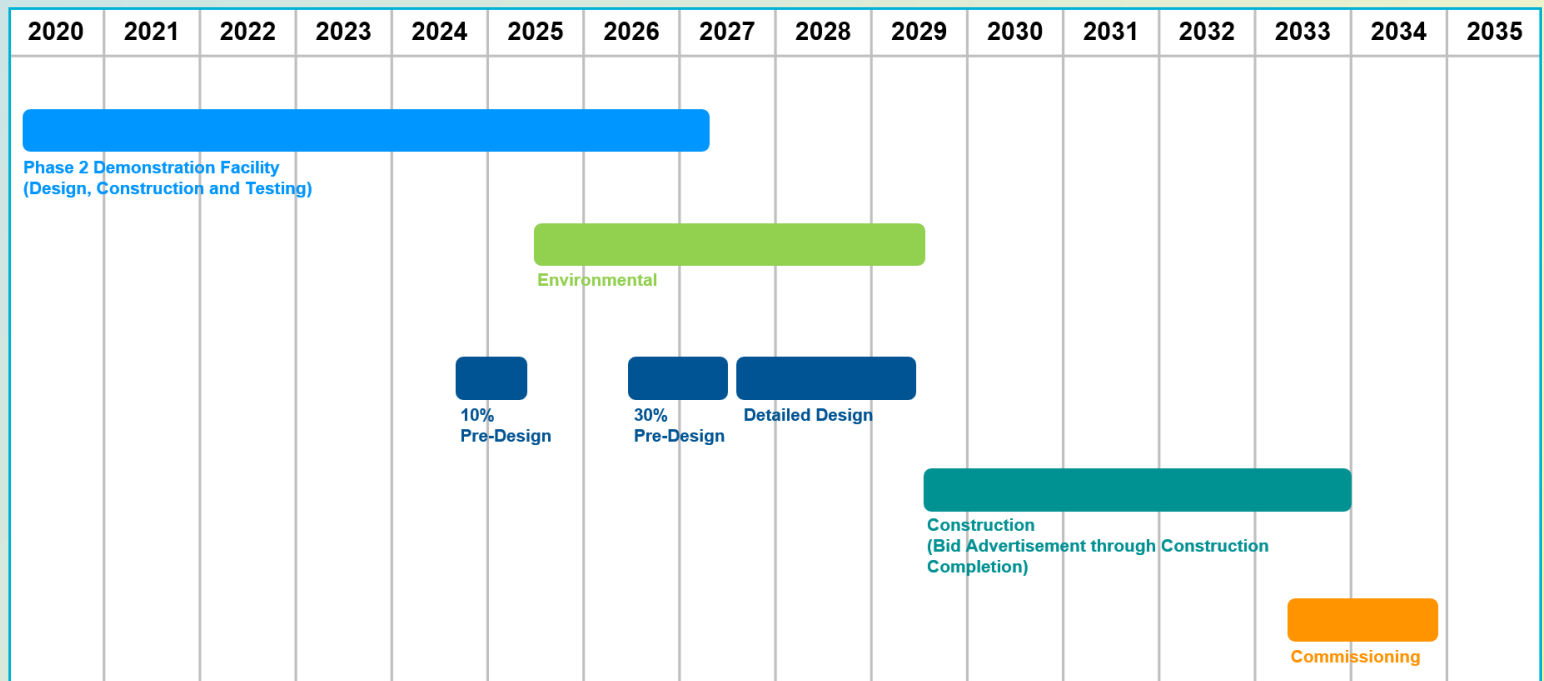
Phase 2 update

Phase 2 Planning

In November, the Pure Water team and the Metro Wastewater Joint Powers Authority (JPA) came together to evaluate and discuss program alternatives for Phase 2. The current design under review for Phase 2 would have a new reclamation plant constructed on City owned property adjacent to the airport on Harbor Drive and would include a new Pure Water Demonstration Facility.



Once treated to recycled water standards, the water will be conveyed to the future Central Area Pure Water Facility, which may be located in Mission Valley on the new San Diego State University satellite campus. The water storage for Phase 2 is being evaluated, with San Vicente and Murray reservoirs being considered as storage options. Phase 2 will produce an additional 53 million gallons per day (mgd).





Recognition and Industry Presence

In December, the Pure Water Program was awarded the Bernays Silver Award of Merit by the Public Relations Society of America, San Diego and Imperial Counties Chapter, for the creative implementation and execution of the 2020 Pure Water San Diego Virtual Contractor Expo.

Presentations about the Pure Water Program were given at conferences for the WaterReuse Association and the American Water Works Association, and the topics included virtual outreach, regulations, water quality and system operations.



American Water Works Association





Pure Water San Diego

Pure Water San Diego Program

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San Diego, CA 92123
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619-533-7572

In This, Together

While we face an unprecedented pandemic, the City of San Diego continues to provide safe, high quality drinking water for its customers each and every day.

Stay healthy and safe, and cheers to a sustainable water future.

Visit purewatersd.org to learn more about the Pure Water Program.



[PureWaterSD](https://www.facebook.com/PureWaterSD)



[PureWaterSD](https://www.youtube.com/PureWaterSD)



[@PureWaterSD](https://twitter.com/PureWaterSD)



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