

2023

# Annual Report







# Table of Contents

<b>Program Overview</b> .....	01
<b>Executive Summary</b> .....	03
<b>Virtual Construction Tour Video</b> .....	05
<b>2023 Milestones</b> .....	06
<b>Phase 1 Construction Overview</b> .....	08
<b>Phase 1 Projects By The Numbers</b> .....	11
<b>Construction Workforce</b> .....	13
<b>Program Funding</b> .....	14
<b>Phase 2 Lookahead</b> .....	16
<b>Operations and Maintenance Readiness</b> .....	18
<b>Regulatory and Environmental Progress</b> .....	21
<b>Engineering and Process Optimization Support Studies</b> .....	25
<b>2023 Pure Water Outreach By The Numbers</b> .....	26
<b>Informational Materials</b> .....	27
<b>Community Outreach and Industry Engagement</b> .....	29









## 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?

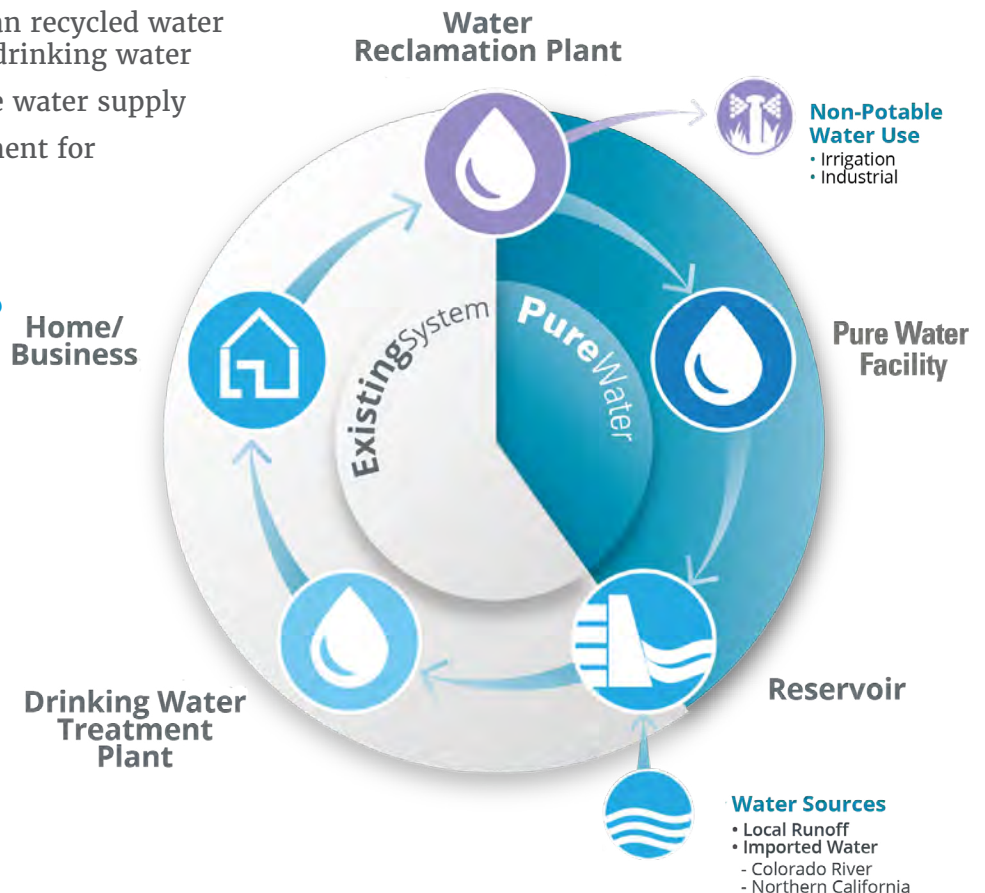
Pure Water San Diego is a phased, multi-year program that will provide nearly half of San Diego's water supply locally by 2035.

## 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.









# Executive Summary

The progress on the Phase 1 Pure Water facilities in 2023 can be measured in concrete and steel. Significant headway is being made on all treatment facility and pipeline projects. The majority of equipment for the North City Pure Water Facility and Metropolitan Biosolids Center has arrived. The North City Pure Water Facility has surpassed **50% completion**, while two of the four new 150-foot diameter secondary clarifiers are nearing completion at the North City Water Reclamation Plant. The Morena Pump Station is beginning to take shape northeast of the Interstate 8 and Interstate 5 interchange near the San Diego River, and one diversion structure is finished with the other three well underway.

Large-scale pipeline construction is continuing on Clairemont Drive, Genessee Avenue, Miramar Road, Kearny Villa Road and Meanley Drive. We are proud that we were able to complete the crossing of the busy Towne Centre Drive/La Jolla Village Drive intersection ahead of schedule in late June with minimal disruption and no incidents. We recognize that at times the construction reduces the lanes for traffic flow and interrupts our customers' daily routines, and we appreciate everyone's continued patience as we navigate complex construction in the public right-of-way.



*Construction in a major intersection for the Morena Northern Pipelines & Tunnels project in University City.*

Over at Miramar Reservoir, we are beginning in-water construction activity. We completed the tunnels for the North City Pure Water Pipeline south of Miramar Reservoir and have begun construction of the Subaqueous Pipeline that will disperse the purified water throughout the reservoir. At the same time, we have been upgrading the 60-year-old pump station that delivers the water from the reservoir to the Miramar Water Treatment Plant. As we reached the latter part of 2023, **\$1.4 million per day** of construction is underway on the City's largest infrastructure program in its history. The low-interest State and Federal financing that the City locked in is being put to good use!

Contractors continue to exceed the goals for hiring historically under-represented workers in the construction field under the Project Labor Agreement and almost **140 City residents** have been hired as apprentices. The Helmets to Hardhats program has successfully placed **more than 60 military veterans** in jobs on the Phase 1 Projects. There are also many preparation activities underway at the North City Water Reclamation Plant and at Miramar Reservoir to ensure that all existing facilities are upgraded and ready to go when purified water is released. These readiness tasks are a mix of new projects, as well as existing facility and component upgrades.

2023 also marked the submittal of three first-of-its-kind reports to the regulatory agencies for their approval. One is a comprehensive plan for how the facilities will be operated to meet strict regulatory requirements, the second plan describes how the purified water flow will be released in a stepwise manner during start-up, and the third plan describes how the many City departments engaged in Pure Water will interact and assigns responsibilities for **more than 100 operating scenarios**.

Planning continues for Phase 2, and we expect to significantly increase the effort as we move into 2024. The following pages further detail our Phase 1 and Phase 2 activities. Although California experienced a very wet winter in 2022-2023, we will continue to have drought cycles for as long as we can predict. A **safe, reliable and locally controlled water supply** continues to be essential to our quality of life in San Diego. Thanks to our customers for your continued support of this critical program!

**Juan Guerreiro, Director**  
City of San Diego Public Utilities Department



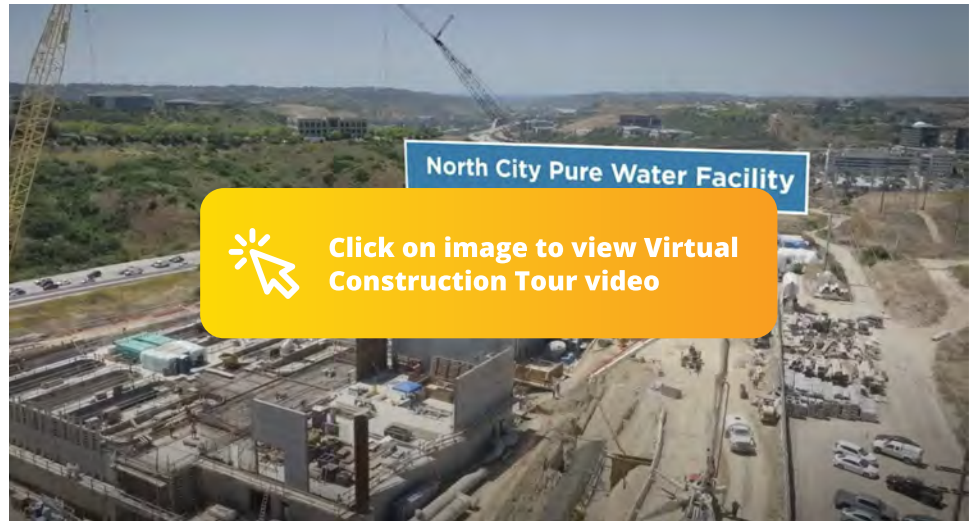




# Virtual Construction Tour Video

Since Phase 1 construction started in 2021, there has been significant progress on the various integrated Pure Water pipelines, treatment facilities and pump stations. These projects have made so much headway that each project site is almost unrecognizable from week to week. In 2023, the City of San Diego developed the Virtual Construction Video for the Pure Water San Diego program not only to highlight and share timely progress with the San Diego community, but also to show some of the faces of those who make Pure Water San Diego happen every day. As the largest infrastructure project that the City has undertaken so far, and after years of planning and engineering, it takes the technical knowledge and skill of more than 2,000 people program-wide to provide a reliable, sustainable and local water supply for generations to come.

The Virtual Construction Video includes remarks from Mayor Todd Gloria, an overview of the projects from Deputy Director Amy Dorman and a spotlight on the cornerstone Pure Water project, the North City Pure Water Facility and Pump Station, from Pure Water Construction Manager, Jeff Soriano.



*Mayor Todd Gloria (left) and Senior Civil Engineer and Construction Manager Jeff Soriano (right) share the progress that has been made at the North City Pure Water Facility and Pump Station and the importance of the Pure Water Program for the future of San Diego's drinking water supply.*



# 2023 Milestones

## JANUARY/FEBRUARY 2023



Began construction on the Interstate 805 tunneling for the Morena Northern Pipelines and Tunnels Project (*photo, left*); participated in the San Diego Têt Festival as part of citywide multicultural and multilingual outreach efforts.

## MARCH/APRIL 2023



Participated in multiple sustainability-focused community events for Earth Month (*photo, right*); prepared for community presentations.

## MAY/JUNE 2023



Started construction on the Morena Pipelines Southern and Middle Alignment and Conveyance Bike Lanes project in Bay Ho/Clairemont (*photo, left*); installed the final steel beam at the North City Pure Water Facility and Pump Station.

## JULY/AUGUST 2023



Completed the intersection crossing at La Jolla Village Drive and Towne Centre Drive ahead of schedule for the Morena Northern Pipelines and Tunnels project (*photo, right*); awarded the construction contract for the Phase 2 – Central Area Small-Scale Facility; began construction at Miramar Reservoir for the North City Pure Water Pipeline and Subaqueous Pipeline project.

## SEPTEMBER/OCTOBER 2023



Construction at the North City Pure Water Facility & Pump Station (*photo, left*) is more than 50% complete; presented to City Council Environment Committee on Pure Water Program progress.

## NOVEMBER/DECEMBER 2023



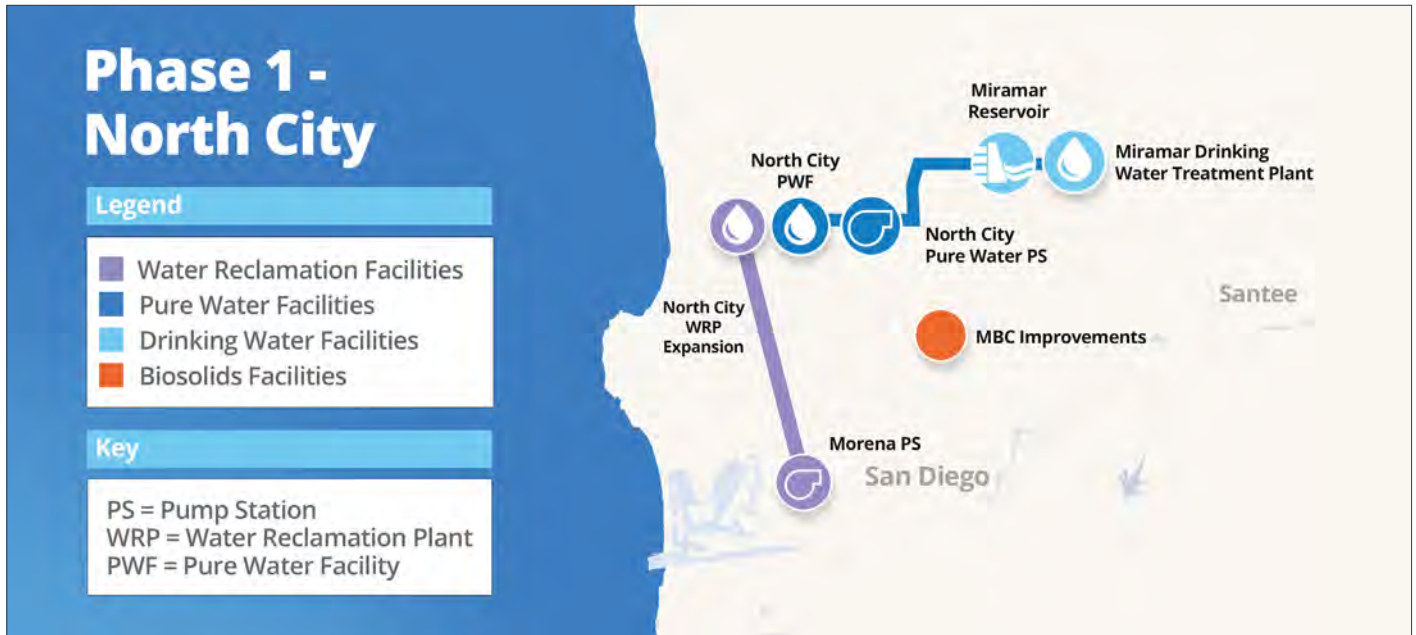
Began the Interstate-15 tunneling shaft for the North City Pure Water Pipeline project; participated in December Nights event at Balboa Park (*photo, right*).







# Phase 1 – Construction Overview



Pure Water Phase 1 North City construction includes 10 total projects, one of which is completed. The table below shows each project and the anticipated completion dates. In total, the budget for the work currently underway for Phase 1 North City is \$1.5 billion. To learn more about Pure Water Phase 1 – North City construction, visit the [Phase 1 Projects](#) page.

Phase 1 North City Project	Start Date	Anticipated Completion	Contract Amount	Prime Contractor
Early Works at the North City Water Reclamation Plant	May 2019	Completed	\$16.4M	AECOM Energy and Construction, Inc.
Morena Pump Station	Jun 2021	2026	\$110.4M	Flatiron West Inc.
Morena Pipelines Southern/Middle Alignment	Oct 2022	2025	\$129.8M	Sukut Construction
Morena Pipelines Northern Alignment and Tunnels	Jun 2021	2024	\$95.2M	OHL USA Inc.
North City Water Reclamation Plant Expansion	Aug 2021	2026	\$255.1M	Kiewit Infrastructure West Co.
North City Water Reclamation Plant Flow Equalization Basin	Dec 2021	2024	\$11.9M	Kiewit Infrastructure West Co.
Metropolitan Biosolids Center Improvements	Sep 2021	2025	\$40.1M	PCL Construction Inc.
North City Pure Water Facility and Pump Station	Apr 2021	2025	\$356.7M	Shimmick Construction Inc.
North City Pure Water Pipelines, Dechlorination Facility and Subaqueous Pipeline	Jun 2021	2025	\$123.5M	W.A. Rasic Construction
Miramar Reservoir Pump Station	Oct 2022	2025	\$12.7M	Shimmick Construction Inc.
<b>Total Combined Construction Contract Amount:</b>			<b>\$1,151,727,837</b>	



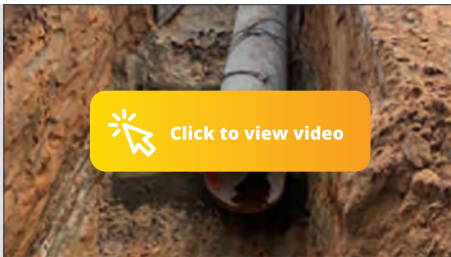
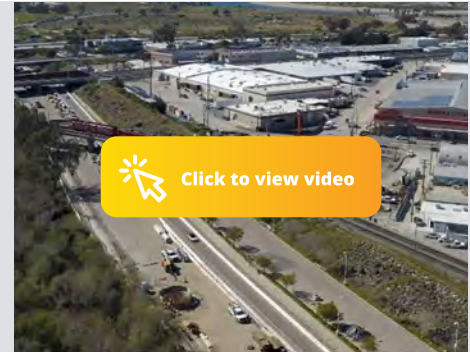
# Phase 1 – Construction

There were nine active construction contracts in 2023 (starting with the Morena Pump Station, moving north):

## [Morena Pump Station](#)

*(Construction began in June 2021)*

Morena Pump Station will divert an average of 32 million gallons per day of wastewater through the Morena Pipeline to the North City Water Reclamation Plant for treatment and the North City Pure Water Facility for purification. In 2023, the contractor completed the construction of four of the eight off-site junction and diversion structures on Friars Road, as well as the new groundwater management system for the pump station excavation. Work is progressing on a fifth structure near Napa Street and Friars Road intersection and at the pump station.



## [Morena Conveyance South & Middle and Bike Lanes](#)

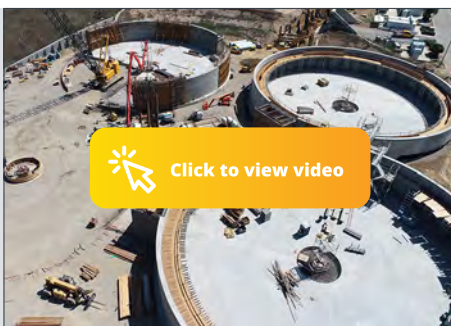
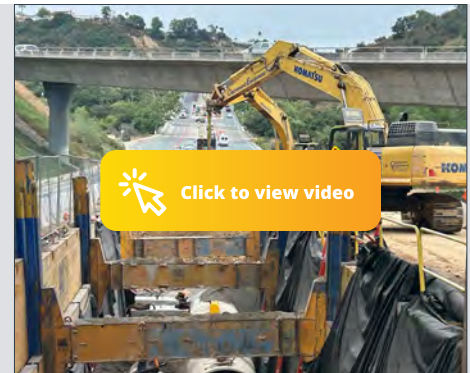
*(Construction began in October 2022)*

The Morena Pipelines Southern and Middle Alignment and Conveyance Bike Lanes project will connect the Morena Pump Station to the Morena Northern Alignment and Tunnels. In 2023, more than 3,000 linear feet of pipeline has been installed on Clairemont Drive.

## [Morena Pipelines Northern Alignment and Tunnels](#)

*(Construction began in June 2021)*

Morena Pipelines Northern Alignment and Tunnels will connect with the Morena Conveyance South & Middle and Bike Lanes and the North City Water Reclamation Plant. In 2023, more than 8,000 linear feet of pipeline has been installed. In July 2023, crews completed the intersection crossing at La Jolla Village Drive and Towne Centre Drive ahead of schedule and completed the intersection crossing at Genesee Avenue and Governor Drive. Construction crews are working in two areas (Genesee Avenue and Towne Centre Drive) and will meet in the middle near Nobel Drive in 2024. Construction at the tunnel projects – San Clemente Tunnel, Rose Canyon Tunnel and Interstate-805 Tunnel – is ongoing.



## [North City Water Reclamation Plant Expansion](#)

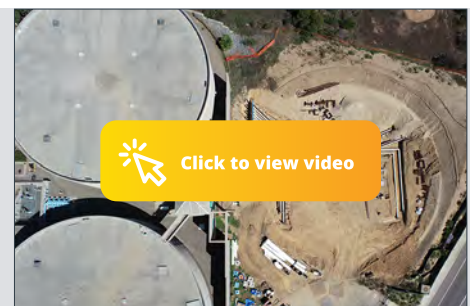
*(Construction began in August 2021)*

The North City Water Reclamation Plant is being expanded to increase production capacity from 30 million gallons per day to 52 million gallons per day. In 2023, about 100 trade workers continue daily construction of underground pipeline throughout the project and the clarifier tanks, which will each hold almost 2.5 million gallons of water and are approximately 150 feet in diameter. Work is also ongoing at the first and second stage bioreactors.

## [North City Water Reclamation Plant Flow Equalization Basin](#)

*(Construction began in December 2021)*

A 2.35-million-gallon Flow Equalization Basin is being built on the North City Water Reclamation Plant project site and will regulate the peak wastewater flow rates to allow for a more constant flow through the plant's treatment processes. This volume is equivalent to almost four Olympic swimming pools. In 2023, all underground piping and electrical, and structural foundation has been completed, and work has begun on the interior columns.





# Phase 1 – Construction

## Metropolitan Biosolids Center Improvements

*(Construction began in September 2021)*

To accommodate increased biosolids due to increased treatment at the expanded North City Water Reclamation Plant, upgrades at the Metropolitan Biosolids Center are necessary. Work to install the dewatering centrifuge, dewatering sludge feed pump and associated polymer pump is complete. Crews continued to work on the second dewatering centrifuge, as well as associated pumps and pipes in 2023.



## North City Pure Water Facility and Pump Station

*(Construction began in April 2021)*

The North City Pure Water Facility and Pump Station will produce an annual average of 30 million gallons per day of purified water, which will be conveyed by the pump station to Miramar Reservoir for storage. In 2023, this cornerstone project of the suite of Pure Water projects is more than 50% complete. Additionally, more than 73% of the concrete structural work has been completed. Almost 1,000 workers have been constructing the North City Pure Water Facility and Pump Station and crews continue to place and install the filtration equipment that will purify treated wastewater from the North City Water Reclamation Plant through a five-step advanced treatment process to create Pure Water.

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

*(Construction began in June 2021)*

The North City Pure Water Pipeline will convey an annual average of 30 million gallons per day of purified water to Miramar Reservoir for storage. The dechlorination facility will remove chlorine necessary for disinfection in the pipe from the purified water before it is delivered into the reservoir. In 2023, more than 4,200 feet of pipe was installed east and west of Interstate 15, including along Miramar Road. Construction associated with the Subaqueous Pipeline started at Miramar Reservoir in August 2023. This construction will involve pipeline assembly and permanent installation on the floor of the lakebed. Ongoing construction includes completion of tunneling into the reservoir and construction of the Subaqueous Pipeline.



## Miramar Reservoir Pump Station Improvements

*(Construction began in October 2022)*

The existing Miramar Reservoir Pump Station pumps the water from Miramar Reservoir to the Miramar Water Treatment Plant. This pump station is being rehabilitated to ensure that it can continually pump 30 million gallons per day on an annual average basis. In 2023, crews completed the 66-inch pipeline replacement and continue to perform generator improvements and installation of the photovoltaic equipment.



# Phase 1 Projects By The Numbers









# Construction Workforce

## CONSTRUCTION WORKFORCE

In total, almost 1,065,000 labor hours have been invested in Phase 1 construction through [October 2023](#). The Project Labor Agreement Coordination Team has provided monthly updates regarding progress toward the Pure Water Program’s hiring goals of City residents<sup>1</sup> and targeted workers<sup>2</sup> for the construction workforce. These reports have kept the Pure Water team apprised as to the Project Labor Agreement goals and enhanced connectivity and communication.

Differentiated by project, the table below demonstrates the current hiring percentages of City residents and targeted workers, through October 2023. The North City Pure Water Facility, North City Pure Water Pipeline and Metropolitan Biosolids Center Improvements projects have a workforce that is comprised of at least one-quarter City residents. Seven of the nine projects are exceeding the 10% goal of targeted worker representation.

### Hiring percentages by project, cumulative through October 2023

Project Name	Contractor	City Resident % (Goal = 35%)	Targeted Worker % (Goal = 10%)
North City Pure Water Facility and Pump Station	Shimmick Construction Inc.	25%	17%
Morena Pump Station	Flatiron West Inc.	20%	5%
Morena Pipelines Northern Alignment and Tunnels	OHL USA Inc.	17%	25%
North City Pure Water Pipeline, Dechlorination Facility and Subaqueous Pipeline	W.A. Rasic Construction	37%	23%
North City Water Reclamation Plant Expansion	Kiewit Infrastructure West Co.	19%	14%
North City Metro Biosolids Center Improvements	PCL Construction Inc.	31%	23%
North City Water Reclamation Plant Flow Equalization Basin	Kiewit Infrastructure West Co.	17%	22%
Morena Conveyance South & Middle and Bike Lanes	Sukut Construction	3%	16%
Miramar Reservoir Pump Station Improvements	Shimmick Construction Inc.	21%	5%
<b>Pure Water Program Phase 1 Projects Total:</b>		<b>23%</b>	<b>16%</b>

Table 1: Hiring percentages by project, cumulative through the latest report as of October 2023.

Note: The Morena Pipelines Southern/Middle Alignment is an additional Pure Water Project but is not yet depicted in this table as it has just started.

<sup>1</sup> “City Residents” is defined as a City of San Diego permanent resident at the time of initial employment on a Covered Project or a Veteran residing anywhere.

<sup>2</sup> “Targeted worker” means any individual qualifying for one or more of the following Targeted Worker categories: (a) Is a veteran, or is the eligible spouse of a veteran of the United States Armed Forces, under Section 2(a) of the Jobs for Veterans Act (38 United States Code [U.S.C.] 4215 [a]); (b) At initial time of employment on a Covered Project, is an Apprentice with less than 10% of the work hours required for graduation to become a Journey person; (c) Has no high school diploma or general education diploma; (d) Is homeless or has been homeless within the last year; (e) Is a former foster youth; (f) Is a custodial single parent; (g) Is experiencing protracted unemployment (receiving unemployment benefits for at least three months); (h) Is a current recipient of government cash or food assistance benefits; (i) Has a documented income at or below 100% of the Federal Poverty Level; and/or (j) Is formerly incarcerated with a history of involvement with the criminal justice system...”



# Construction Workforce

The percentage of City residents employed continues to increase; currently, there are 565 City residents employed on Pure Water projects. City residents constructing Pure Water projects have earned \$12,417,000 in wages and benefits through September of 2023. It is critical that the City's largest infrastructure undertaking supports local San Diegans with jobs.



Veterans and apprentices make up a significant proportion of the targeted workers. Four project sites sponsor Helmets to Hardhats, a career program for veterans: the North City Pure Water Facility and Pump Station; the North City Water Reclamation Plant Expansion; the North City Pure Water Pipeline, Dechlorination Facility and Subaqueous Pipeline; and Metropolitan Biosolids Center Improvements.

In total, more than 33,180 hours have been worked by veterans on the Pure Water projects through June 2023. In May, the 2023 class of apprentices graduated from the San Diego College and Southwestern College Apprenticeship Readiness Programs. On their way to becoming journeypersons, apprentices support the construction of Pure Water projects while completing their final hours to certification.



## Jose Luis Garcia

Meet Jose Luis Garcia, a former Corporal in the United States Army who chose to begin his construction career as a laborer because he felt it was a good transition for the transferable skills he gained working in field artillery in the Army. With a growing family, the living wages, healthcare and stability to put down roots in one location helped solidify his choice. Jose went to the LIUNA Laborers Local 89 boot camp and currently works on the Metropolitan Biosolids Center Improvements project.

## Program Funding

The City has received and continues to apply for grants and loans from both the federal and state governments. Water Infrastructure Finance and Innovation Act loans from the U.S. Environmental Protection Agency are currently providing \$733.5 million for Phase 1 construction. The larger loan – \$614 million – has an interest rate of only 1.29%, and the second loan – \$119.5 million – has a low-interest rate of 1.82%. In April, the State Water Board signed four separate loans for a total of \$664 million to also support Phase 1 construction. The State Water Board loans have very favorable interest rates between 0.8 and 1.1%. As of October 2023, the City has received \$240 million from Water Infrastructure Finance and Innovation Act and \$88 million from the Clean Water and Drinking Water State Revolving Fund loans.

In addition to these loans, the City has received \$81.5 million in grants from funding agencies, which do not have to be repaid and accrue a direct savings to ratepayers.









# Phase 2 Lookahead

Although Pure Water Phase 1 construction and other activities in preparation for releasing purified water to Miramar Reservoir are taking center stage, planning for the Pure Water Phase 2 facilities is underway.

## PURE WATER PHASE 2 CENTRAL AREA SMALL-SCALE DEMONSTRATION FACILITY

As with Pure Water Phase 1, a small-scale demonstration facility is a regulatory requirement for Pure Water Phase 2 because it will treat water from a different wastewater collection area with different wastewater characteristics. In addition, there will be two unique treatment trains to address different regulatory requirements depending on whether the City pursues Indirect Potable Use or Direct Portable Reuse. The small-scale facility will be located at the Point Loma Wastewater Treatment Plant; its design was completed in October 2022, and the construction contract was awarded in July 2023.

A detailed testing and monitoring plan will be implemented when the Central Area Small-Scale Facility begins operating in 2025. The plan details the process equipment, operations testing, monitoring for pathogen and chemical control, and additional testing to compare the performance of treatment technologies. This plan was vetted by the City's Independent Advisory Panel comprised of experts in potable reuse treatment and public health. Upon approval from the Independent Advisory Panel, it was submitted to the California Division of Drinking Water, who also approved it.



Initial site work at the Central Area Small Scale Facility began in October 2023.

## SCENARIO PLANNING

Rapidly developing changes in climate and water supply associated with drought cycles, water conservation and consequent reductions in wastewater flows, and socio-economic factors – and the continued uncertainty in these influences that strongly affect Phase 2 of the Pure Water Program – led the Public Utilities Department to undertake a Scenario Planning process. Scenario Planning is an adaptation of classic military intelligence methods that combine known facts with plausible alternative social, technical, economic and political trends that are key driving forces affecting an uncertain future. Since the 1970s, this technique has been used extensively in private enterprise and started being used by many water agencies in the early 2000s. It allows the Public Utilities Department to make decisions that would be most beneficial to the Pure Water Program no matter how the future unfolds.

The Public Utilities Department's Scenario Planning process developed alternative futures based upon driving forces (e.g., regional water supply and demand) that are hard to predict but will have a significant impact on how Pure Water Phase 2 is implemented. Common elements among the futures were identified that should be implemented regardless of how the future unfolds. Key data needs to inform decision making were also identified, and the Public Utilities Department is now using these data to refine and validate the Pure Water Phase 2 facility plan. The validated plan will become the basis for budgeting, scheduling and preparation of the Pure Water Phase 2 Program Environmental Impact Report and facility designs.



Scenario Planning Workshop







# Operations and Maintenance Readiness

## OPERATIONS AND MAINTENANCE READINESS

The Pure Water Operations division is working to ensure City staff are prepared to operate and maintain the North City Pure Water Facility 24 hours per day, 365 days per year. A total of 45 positions across the operations, maintenance, engineering and administrative disciplines have been approved for Pure Water Operations for this effort. Recruitments are being conducted according to a hiring plan that synchronizes with the construction schedule. Specific readiness tasks include:



*Rendering of the North City Pure Water Facility.*

- All senior operations staff must obtain the new Advanced Water Treatment Operator Certification. There are three levels of certification, and the higher the operator classification, the higher the required level of certification. Four of our staff have obtained all their required certifications. As new senior operations staff come on board, they will receive various forms of training to not only learn how to operate the purification process but to also prepare for their certification exams.
- Staff must participate in various construction-related activities such as commissioning planning, equipment submittal reviews, and the development of instrumentation and control screens.
- Staff must create North City Pure Water Facility asset maintenance plans and service schedules within enterprise asset management. In addition, they must observe and document construction from start to finish to ensure awareness of facility locations and configurations, and flag logistical conflicts.

To help ensure these staffing needs are met, Pure Water Operations has implemented comprehensive and innovative measures as part of a multi-pronged hiring effort. This includes wide-reaching, industry-targeted advertisement of open positions as well as attending recruitment events. In addition, the division is participating in the Cuyamaca Center for Water Studies Industry Advisory Group to assist in securing a pipeline of future high-performing employees. In 2023, Pure Water Operations completed the hiring and onboarding of two Pure Water Plant Operations Supervisors, one Instrumentation and Control Technician, one Instrumentation and Control Trainee and one Plant Process Control Electrician.

## CERTIFICATION AND TRAINING

To ensure proper training and certification of our staff, Pure Water Operations implemented an Operator Training Program. This training program includes self-directed trainings, skills-based training, instructor-led training, construction and contractor training, and specialty training. Hands-on training is accomplished at the City's Pure Water Demonstration Facility, a 1 million gallons per day plant that includes the same treatment and monitoring equipment that will be included at North City Pure Water Facility.



*Advanced Water Treatment (AWT) certification training course, photo courtesy of Trussell Tech.*



To ensure operators have the proper knowledge base to operate an Advanced Water Treatment facility, the City, along with agencies across the state, partnered with the American Water Works Association and the California Water Environment Association to develop the Advanced Water Treatment Operator Certification program; this certification is designed to ensure certified drinking water and wastewater operators are equipped to operate potable reuse facilities in compliance with regulations. To prepare staff to obtain this new certification, the City enlisted the assistance of a consultant to develop and implement a first-of-its-kind Advanced Water Treatment Academy. In this academy, operators learn about each of the purification processes, critical performance measures and controls, and water quality monitoring. The Academy was presented to 28 City staff in early 2023 and will be offered again to staff in January of 2024. Subsequent academies will be taught by Pure Water Operations staff.



An instructor speaks to a class as part of the Advanced Water Treatment (AWT) certification training course, photo courtesy of Trussell Tech.

## Advanced Water Treatment Operator Training Materials

The AWT3 Training conducted January 2023 included 3 new and a total of 8 modules: Ozone, BAC, Membrane Filtration, Wastewater and MBR, Drinking Water and Disinfection, Potable Reuse Regulations.

<p><b>AWT Module 1: Ozone Treatment</b> Grade 3 Training Module</p> <p>Aleks Pisarenko, Ph.D. &amp; Elise Chen, P.E. June 2022</p> <p>Prepared for <b>SAN DIEGO</b> City of San Diego Public Utilities Department Pure Water Program</p> <p>Prepared by <b>Trussell</b></p> <p><small>Copyright 2022 by the City of San Diego Public Utilities Department. All rights reserved. This publication, or parts thereof, may not be reproduced without permission.</small></p>	<p><b>AWT Module 2: Biological Activated Carbon Treatment</b> Grade 3 Training Module</p> <p>Aleks Pisarenko, Ph.D. &amp; Elise Chen, P.E. June 2022</p> <p>Prepared for <b>SAN DIEGO</b> City of San Diego Public Utilities Department Pure Water Program</p> <p>Prepared by <b>Trussell</b></p> <p><small>Copyright 2022 by the City of San Diego Public Utilities Department. All rights reserved. This publication, or parts thereof, may not be reproduced without permission.</small></p>	<p><b>AWT Module 3: Membrane Filtration Treatment</b> Grade 3 Training Module</p> <p>Aleks Pisarenko, Ph.D., Elise Chen, P.E., Aviv Kolakovsky, P.E. &amp; Rodrigo Tackaert, P.E. June 2022</p> <p>Prepared for <b>SAN DIEGO</b> City of San Diego Public Utilities Department Pure Water Program</p> <p>Prepared by <b>Trussell</b></p> <p><small>Copyright 2022 by the City of San Diego Public Utilities Department. All rights reserved. This publication, or parts thereof, may not be reproduced without permission.</small></p>	<p><b>AWT Module 4: Reverse Osmosis Treatment</b> Grade 3 Training Module</p> <p>Aleks Pisarenko, Ph.D., Elise Chen, P.E., Aviv Kolakovsky, P.E. &amp; Rodrigo Tackaert, P.E. June 2022</p> <p>Prepared for <b>SAN DIEGO</b> City of San Diego Public Utilities Department Pure Water Program</p> <p>Prepared by <b>Trussell</b></p> <p><small>Copyright 2022 by the City of San Diego Public Utilities Department. All rights reserved. This publication, or parts thereof, may not be reproduced without permission.</small></p>
<p><b>AWT Module 5: Ultraviolet Light/Advanced Oxidation Process Treatment</b> Grade 3 Training Module</p> <p>Aleks Pisarenko, Ph.D., Elise Chen, P.E., Aviv Kolakovsky, P.E. &amp; Rodrigo Tackaert, P.E. June 2022</p> <p>Prepared for <b>SAN DIEGO</b> City of San Diego Public Utilities Department Pure Water Program</p> <p>Prepared by <b>Trussell</b></p> <p><small>Copyright 2022 by the City of San Diego Public Utilities Department. All rights reserved. This publication, or parts thereof, may not be reproduced without permission.</small></p>	<p><b>AWT Module 6: Wastewater Treatment and Membrane Bioreactors</b> Grade 3 Training Module</p> <p>Aleks Pisarenko, Ph.D. &amp; Elise Chen, P.E. June 2022</p> <p>Prepared for <b>SAN DIEGO</b> City of San Diego Public Utilities Department Pure Water Program</p> <p>Prepared by <b>Trussell</b></p> <p><small>Copyright 2022 by the City of San Diego Public Utilities Department. All rights reserved. This publication, or parts thereof, may not be reproduced without permission.</small></p>	<p><b>AWT Module 7: Drinking Water Treatment and Disinfection</b> Grade 3 Training Module</p> <p>Emily Owens-Bennett, PE. &amp; Jacob Newman June 2022</p> <p>Prepared for <b>SAN DIEGO</b> City of San Diego Public Utilities Department Pure Water Program</p> <p>Prepared by <b>Trussell</b></p> <p><small>Copyright 2022 by the City of San Diego Public Utilities Department. All rights reserved. This publication, or parts thereof, may not be reproduced without permission.</small></p>	<p><b>AWT Module 8: Potable Reuse and Regulations</b> Grade 3 Training Module</p> <p>Anya Kaufmann, PE. &amp; Rodrigo Tackaert, P.E. June 2022</p> <p>Prepared for <b>SAN DIEGO</b> City of San Diego Public Utilities Department Pure Water Program</p> <p>Prepared by <b>Trussell</b></p> <p><small>Copyright 2022 by the City of San Diego Public Utilities Department. All rights reserved. This publication, or parts thereof, may not be reproduced without permission.</small></p>







# Regulatory and Environmental Progress

## MIRAMAR RESERVOIR NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT AND WATER SUPPLY PERMIT

There are approximately 40 conditions under the Miramar Reservoir National Pollutant Discharge Elimination System permit for Miramar Reservoir that must be met prior to release of purified water into the reservoir. Three of them are first-of-their-kind reports under the Indirect Potable Reuse Surface Water Augmentation Regulations that were adopted by the California State Water Resources Control Board in March 2018. The North City Pure Water Project Operations Plan, Operational Ramp-Up Plan, and Joint Plan were all submitted to the California Division of Drinking Water on Sept. 1, 2023, for their review and comment. These plans are the foundation for operating the Pure Water Phase 1 integrated system and managing the release of purified water to Miramar Reservoir, the first reservoir augmentation project in the State.



*The first reservoir augmentation project in the State of California will be the Pure Water Subaqueous Pipeline at Miramar Reservoir (photo by MrGALL).*

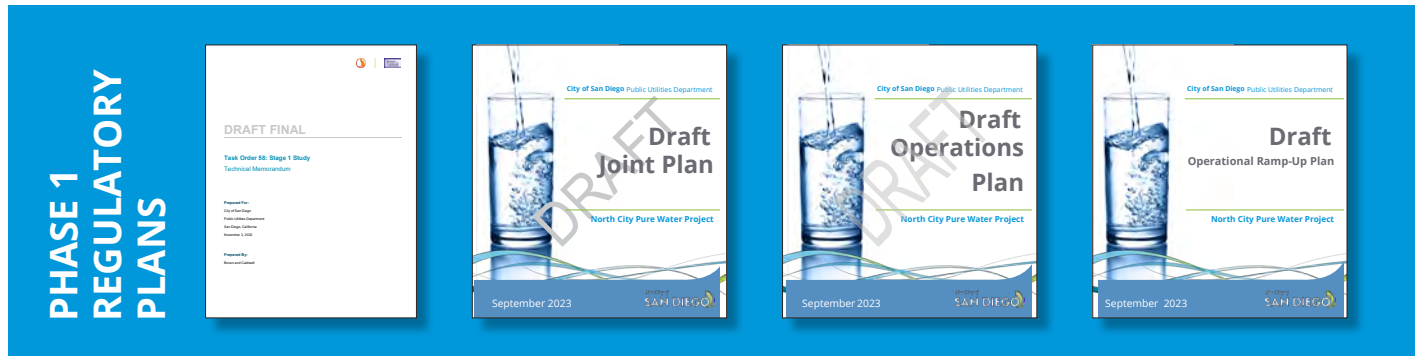
- The Operations Plan details how the North City Pure Water Facility will be operated to ensure regulatory compliance, including sections on the detailed operational requirements for each of the North City Pure Water Facility unit processes (e.g., reverse osmosis), operation of Miramar Reservoir, water quality monitoring and other support systems.
- The Operational Ramp-Up Plan details how flow will be introduced to Miramar Reservoir, reliability approaches, the requirements to progress through the three sequential increased flow periods and monitoring at the Miramar Water Treatment Plant.
- The Joint Plan outlines how various Public Utilities Department divisions will interact, assigns division responsibility for each of almost 100 operational and regulatory activities, how different divisions will communicate to ensure requirements are met, and how emergencies will be addressed and managed.

These documents establish strict requirements and protocols that must be followed to maintain public health and safety of the drinking water supply. All Public Utilities Department divisions that will participate in the production of Pure Water were deeply engaged in the preparation and review of these documents.

Comprising a total of almost 2,000 pages, the three documents were released almost two years ahead of the required deadline. Such an early submittal satisfied the California Division of Drinking Water's request for advanced copies given the prototypical nature of these submissions. The early submittal also allows time to refine the documents based on the California Division of Drinking Water's comments, and for that next revision to be utilized during system-wide commissioning. Lessons learned during system-wide commissioning will be incorporated so these guiding documents can be continuously improved.



In addition, the first part of a two-stage study to establish any additional limits on discharges to the collection system to protect the Pure Water facilities and reservoir water quality was completed in early 2023 and reviewed by regulators. Sampling for the second stage is underway and builds upon the first stage of the study. Findings of this study are expected to be released in 2024.



## DIRECT POTABLE REUSE REGULATIONS

The State Water Resources Control Board is required to issue [final regulations for direct potable reuse](#) by December 31, 2023. As with the Indirect Potable Reuse regulations that were adopted by the State Water Resources Control Board in 2018, the City has been working very closely with the California Division of Drinking Water to provide a real-world example of how the draft direct potable reuse regulations could be applied. With the City's example in hand, the California Division of Drinking Water modified the draft regulations in ways that are appropriate and adaptable to future project proposers. The State Water Resources Control Board released its draft direct potable reuse regulations for public review on July 21, 2023, and an updated draft on October 4, 2023. The October draft incorporated many changes requested by the City, notably in the areas of alternative treatment for pathogen control and the impact of blending on total organic carbon in the distribution system. The leadership position that the City has taken in bringing issues with defined examples to the regulators will benefit the application of potable reuse in San Diego, and elsewhere in California.

## POINT LOMA WASTEWATER TREATMENT PLANT PERMIT

In addition to the ongoing activities to address regulatory requirements for the Pure Water Phase 1 facilities, the renewal of the National Pollutant Discharge Elimination System permit for the Point Loma Wastewater Treatment Plant is underway. [The Point Loma Wastewater Treatment Plant](#) has a modified permit for enhanced primary treatment that is jointly issued by the U.S. Environmental Protection Agency and the San Diego Regional Water Quality Control Board, as long as Pure Water is implemented. The current permit was adopted in October 2017. As required, the City submitted a renewal application in March 2022, six months prior to the expiration date. The permit was administratively extended on Sept. 27, 2022, to allow for continued operation under the current permit until a new one is issued. The San Diego Regional Water Quality Control Board is currently preparing a draft Tentative Order that will then be released for public comment. Following the public comment period, the San Diego Regional Water Quality Control Board will respond to comments and prepare and adopt a Final Order. The City estimates that it will receive the final permit in 2024.



*The Point Loma Wastewater Treatment Plant*



## OCEAN POLLUTION REDUCTION ACT II

On March 22, 2023, Congressman Scott Peters [reintroduced the Ocean Pollution Reduction Act II](#) (H.R.1720), which proposes modifying the permitting requirements for discharge of pollutants from Point Loma Wastewater Treatment Plant. This bill contains required milestones in line with projected reductions in both the treated discharges from the Point Loma Wastewater Treatment Plant and the production of potable water expected with Pure Water Phase 1 and Phase 2. Congressman Peters continues to work with staff from the Committee on Transportation and Infrastructure to schedule a hearing for the Ocean Pollution Reduction Act II, similar to the last two Congresses. The bill must go through the Committee before the House floor and then on to the Senate for consideration.

## PURE WATER PHASE 1 PROJECTS ENVIRONMENTAL COMPLIANCE

Biological, archaeological and paleontological monitoring is conducted for active Pure Water Phase 1 construction packages in accordance with the Mitigation, Monitoring and Reporting Program adopted as part of the [Final Environmental Impact Report/Environmental Impact Statement](#) for Pure Water Phase 1.

The SANDER Vernal Pool and Upland Mitigation Site, which offsets impacts to sensitive biological resources at the North City Pure Water Facility, completed year three of a seven-year maintenance and monitoring program. Maintenance work in 2023 focused on weed control by removing non-native biomass throughout the site. In addition, anthropogenic trash removal and boundary fence repairs also occurred.

The Pueblo South Native Grassland Mitigation Creation Site (*photos, below*) completed year four of a five-year maintenance and monitoring program. The impetus of maintenance work for 2023 also included controlling weeds before they set seed. Additional work included ongoing gopher control and hand broadcasting native seed mix in sparse locations throughout the site. The site continues to exceed the annual performance standards.









# Engineering and Process Optimization Support Studies

## NORTH CITY PURE WATER FACILITY RESEARCH

The City continues to operate and maintain the Pure Water Demonstration Facility, a 1 million gallon per day plant that comprises the advanced treatment processes that will be used in the North City Pure Water Facility. The Pure Water team completed a U.S. Bureau of Reclamation grant-funded research project that evaluated the impact of bromide on reverse osmosis membrane oxidation and compliance with water quality regulations. In 2023, an additional round of testing was completed to evaluate effectiveness of selected control measures to minimize disinfection by-products and bromate formation, as well as determine reverse osmosis membrane performance under different operating conditions. The report was finalized in March 2023.



*The Pure Water Demonstration Facility*

In addition, the team modified the demonstration facility to perform high-recovery testing for the reverse osmosis membranes. In 2023, the City started evaluating the impact on water quality when reverse osmosis recoveries are increased from 85% recovery to between 90% and 95% recovery. Higher recovery increases the amount of purified water produced for a given influent flow. It also reduces the reject water that must be disposed of.

A tracer test through the North City Water Reclamation Plant treatment processes was performed in 2022 to provide additional information on hydraulic performance that will aid the Independent Advisory Panel's assessment of additional treatment credit at the plant. The Independent Advisory Panel reviewed the results of the study in 2023 and the City is preparing a draft report to seek additional pathogen removal credit from the regulators. Additional credit would recognize the added levels of protection provided during treatment, provide flexibility for treatment operations for the Pure Water Phase 1 facilities and aid in reliably maintaining regulatory compliance.



# 2023 Pure Water Outreach By The Numbers



November 2023



# Informational Materials

## PHASE 1 WEBSITE IMPROVEMENTS

In 2023, an audit of the current [Pure Water website](#) was conducted to identify areas for improvement. Based on the audit recommendations, the website is currently being enhanced to demonstrate progress and highlight the comprehensive outreach on Pure Water Phase 1 projects, while making sure the webpages are as visually compelling as possible. The updated website will ensure optimal wayfinding for key information and facilitate increased user accessibility.

## GIS MAP

The regularly updated [Phase 1 North City interactive closure map](#) enables users to quickly find information on road closures, detours and impact-related information by project.

## FACT SHEETS IN NEW LANGUAGES

Pure Water fact sheets have been available in Spanish and English. The accessibility of Pure Water Phase 1 information has been expanded into three more languages: Vietnamese, Korean and Mandarin. Fact sheet materials are available on the Informational Materials page of [purewatersd.org](#).

## YOUTH ACTIVITY BOOKLET

The [redesigned youth activity booklet](#) was launched in spring 2023 as a resource targeted to a younger audience, providing information about water reuse and sustainability through interactive games. This booklet includes simplified information about the purification process, shared through writing prompts, key words and coloring activities.



Examples of fact sheets (available in English, Spanish, Mandarin, Korean, Vietnamese)



The Pure Water Youth Activity Booklet



Click to view the Informational Materials webpage



Phase 1 Projects fact sheet (available in English, Spanish, Mandarin, Korean, Vietnamese)







# Community Outreach and Industry Engagement

## COMMUNITY EVENTS

The Pure Water outreach team engaged with the community members at 16 community events: the Festival, Dexcom Earth Day Fair, SONY Earth Day Fair, Bike Anywhere Day, Ocean Beach Street Fair, University City 4th of July, Scripps Ranch 4th of July, Filipino-American Friendship Festival, Standley Summer Safety Splash, Mayor Gloria's Back to School Celebration, Girl Scouts Volunteer Conference, Clairemont Family Day, Mira Mesa Street Fair, University City Oktoberfest, Walter Munk Oceans Day and December Nights. These events provided a fun and engaging way for the team to meet face-to-face with stakeholders and residents, answer questions and share updates about the program.



The Pure Water team attended multiple community events in 2023 and were joined by several city officials, including Mayor Todd Gloria and Councilmembers Kent Lee and Jennifer Campbell.

## SPEAKERS BUREAU PROGRAM

As construction activity increased in 2023, the Speakers Bureau program expanded to include new speakers, a refreshed presentation with engaging, interactive maps and timely construction content. Pure Water held informational meetings for a variety of organizations, community groups and planning groups like the University of California San Diego, Marston Middle School and the League of Women Voters.

During these presentations a wide range of topics was covered, including program regulations, project maps, wastewater treatment processes, the history of recycling drinking water and project updates. Additionally, we held internal trainings to increase our knowledge across City departments including the Public Utilities Department and Strategic Capital Projects Department.



Pure Water team members presented to Marston Middle School students.



An audience receives a presentation before touring the Demonstration Facility.



## INDUSTRY AND ELECTED OFFICIAL TOURS

While tours at project sites like the North City Pure Water Facility and Pump Station and the Pure Water Demonstration Facility continue to be paused for public access due to ongoing construction and site safety protocols, select industry and elected official tours were accommodated in 2023. These select tours were an opportunity for industry leaders and community leaders to see the progress and learn more about what the community can expect once the Pure Water Phase 1 projects are completed.

In 2023, more than 40 tours and presentations were given to industry group members and community stakeholders, including City of San Diego employees, the American Society of Civil Engineers, San Diego Regional Policy and Innovation Center, U.S. Navy environmental personnel, participants from the California Association of Sanitation Agencies annual conference, I Love a Clean San Diego, American Public Works Association Expo conference participants and DC Water. Construction progress-focused tours were also offered to team members from the offices of Senator Toni Atkins, Governor Gavin Newsom, Assemblymember Chris Ward and City Council Districts 1, 3, 5, 6, 7, 8 and 9.



*Representatives from offices of Sen. Toni Atkins, Gov. Newsom, Asm. Chris Ward check out the construction progress.*



*DC Water tours the North City Pure Water Facility and Pump Station.*



*Participants from the California Association of Sanitation Agencies taste Pure Water at the Demo Facility after the annual CASA conference.*

## CONFERENCE PARTICIPATION

At the 2023 National WaterReuse Symposium in March, the Pure Water team hosted about 100 attendees for a 60-minute panel about the planning for Pure Water Phase 2. In April, the Pure Water team presented a session to a packed room on the history, regulations, construction status and operational readiness planning efforts at the California Water Environment Association Annual Conference as part of an update on potable reuse initiatives in the San Diego area. Additionally, the Pure Water team presented at the American Public Works Association's National Public Works Expo in August. Finally, at the California WaterReuse Annual Conference in November, the Pure Water team delivered two lessons learned presentations describing the complexities of reservoir management for potable reuse and the regulatory activities that must be completed to allow augmentation of a surface water reservoir. Industry conferences are an important avenue to gather water professionals from across the country to learn and share about their practices and innovations.



*Pure Water panelists at the American Public Works Association's National Public Works Expo in August 2023.*



## CONSTRUCTION OUTREACH

Proactive, robust construction outreach is ongoing as part of the Pure Water Phase 1 projects in Linda Vista, Clairemont, University City, Miramar and Scripps Ranch. In addition, programmatic outreach continues citywide. The construction outreach team fielded and resolved approximately 90 construction-related stakeholder inquiries in 2023 via the three community phone lines and a dedicated email address, [purewatersd@sandiego.gov](mailto:purewatersd@sandiego.gov).

The outreach team strategically distributed project and schedule information via construction notices, website updates, social media content, fliers, doorhangers and e-blasts. Each outreach liaison worked together with the project-specific construction management team, contractor and community groups, stakeholders and residents to ensure the timely delivery of construction-related information.

Monthly meetings and updates resumed to the University Community Planning Group and University City Community Association. Ad-hoc presentations were provided to the Clairemont Planning Group, Clairemont Town Council, Scripps Ranch Planning Group, Scripps Ranch Civic Association, Mira Mesa Planning Group, and Miramar Ranch North Planning Committee and Pure Water Working Group members.

Pure Water Project Contact Information <a href="mailto:purewatersd@sandiego.gov">purewatersd@sandiego.gov</a>	
Community	Phone
Morena, Bay Park and Clairemont	833-MOR-PWSD (833-667-7973)
University City and Eastgate Mall	833-UTC-PWSD (833-882-7973)
Scripps Ranch and Miramar	833-MIR-PWSD (833-647-7973)

## 2023 Construction Outreach Recap

32

e-blasts distributed to approximately 4,108 recipients

90

inquiries received and resolved

20

presentations given to community groups, informing approximately 450 people in various community organizations

Outreach teams tabled at the Miramar Reservoir project site for 10 days



The outreach team shared information about planned work at Miramar Reservoir.







The City of San Diego continues to provide safe, high quality drinking water for its customers each and every day.

Visit [purewatersd.org](http://purewatersd.org) to learn more about the Pure Water Program.



Pure Water San Diego Program

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