



THE CITY OF SAN DIEGO
PUBLIC UTILITIES
DEPARTMENT

Water Purification Demonstration Project





What you should know...

- San Diego needs to develop local, reliable sources of water.
- Water Purification Demonstration Project is examining the use of advanced purified water.
- The purified water goes through multiple advanced treatment steps.
- No purified water will be added to the drinking water system during the Demonstration Project.



Water Supply Challenges



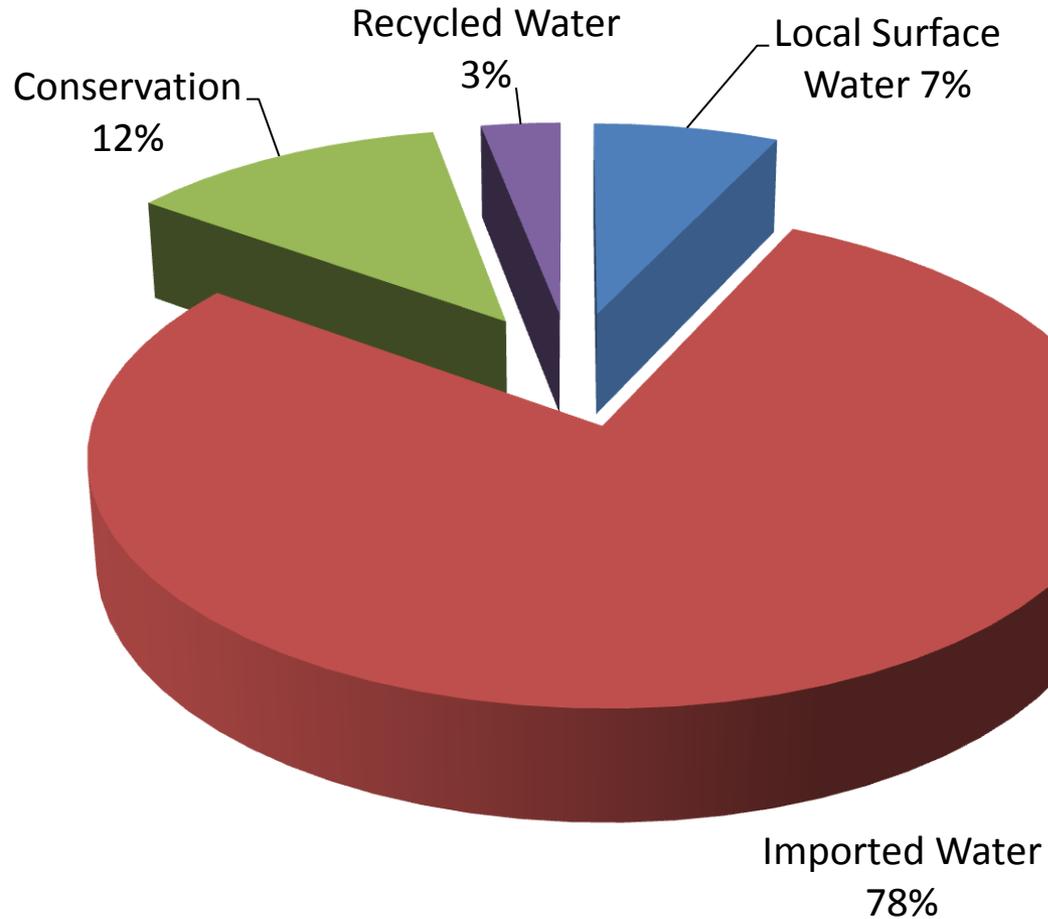
- Rising costs of imported water
- Pumping restrictions
- Population growth
- Earthquakes



**SAN DIEGANS
WASTE
NO WATER**
ALL DAY. EVERY DAY.



City's Water Supply



Average (2005-2010)

California Water Projects



Federal Water Projects

- Central Valley Project
- Coachella Canal
- All American Canal

State Water Projects

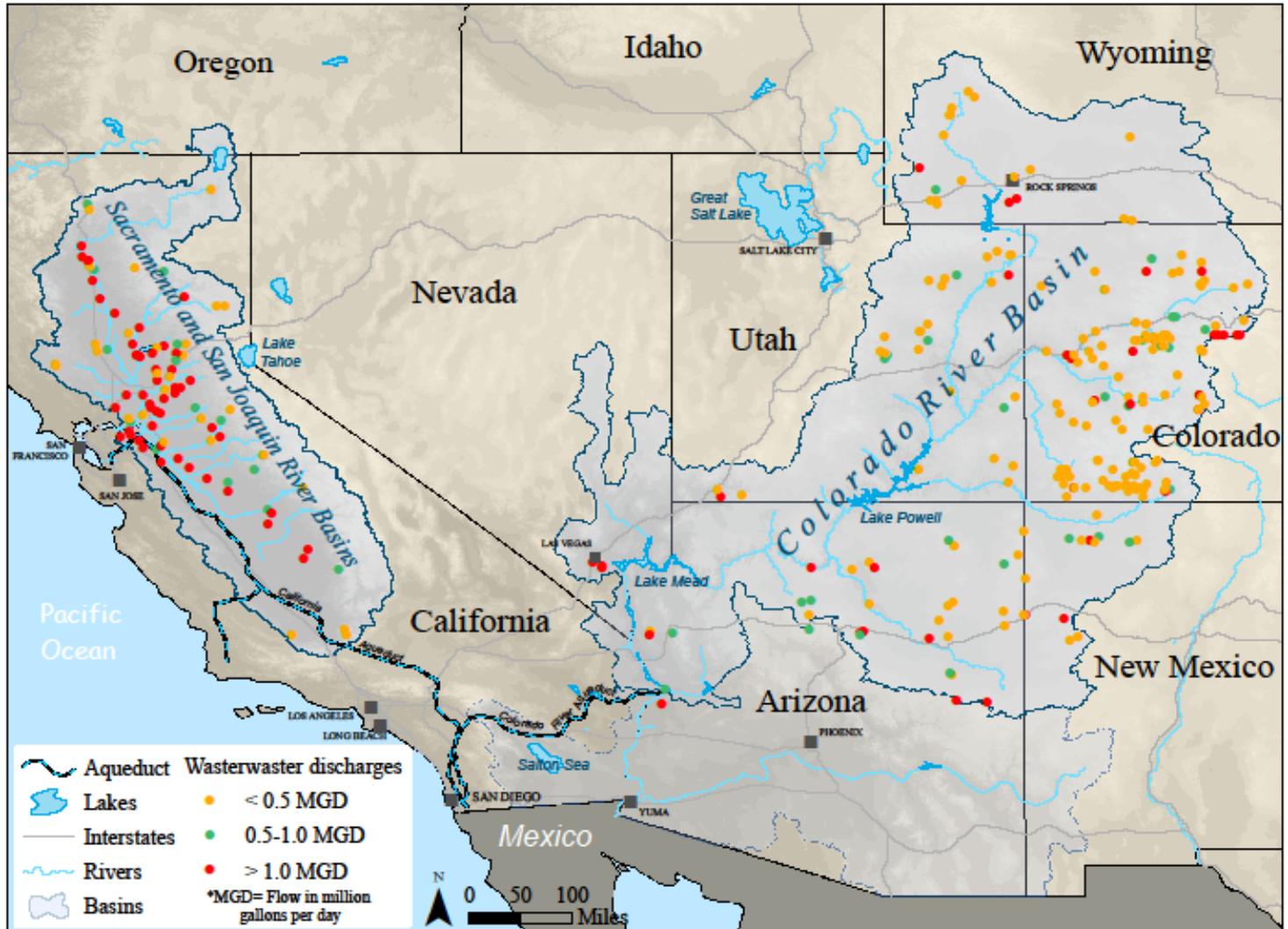
Local Water Projects

- Mokelumne Aqueduct
- Hetch Hetchy Aqueduct
- Los Angeles Aqueduct
- Colorado River Aqueduct

Bay-Delta



Upstream Wastewater Discharges

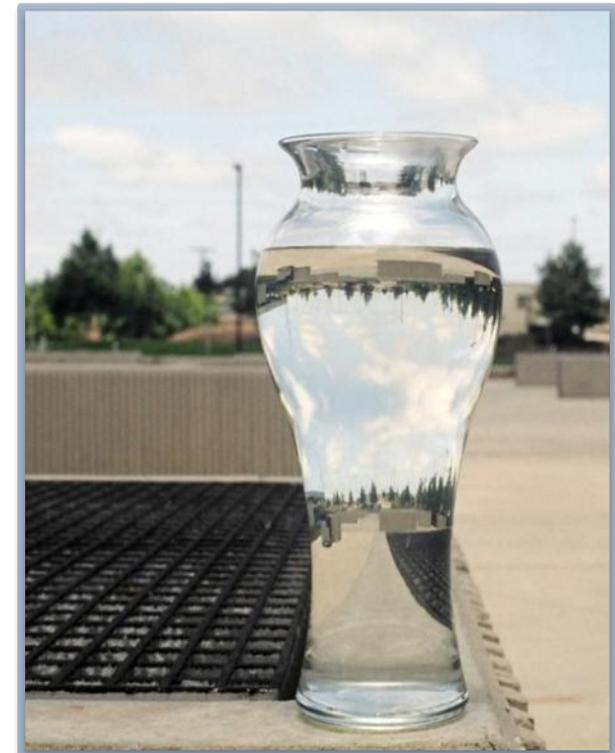




What is being done...



- Water Conservation
- Groundwater Development
- Recycled Water
- The Water Reuse Program





San Diego's Water Reuse Program



Water Reuse Study - (complete)



Water Purification Demonstration Project





Project Components



- Operate 1 MGD facility
- San Vicente Reservoir study
- Define regulatory requirements
- Conduct energy and economic analysis
- Public education and outreach



Outcomes

- Validate treatment process
- Gain regulatory approval
- Evaluate cost
- Public acceptance



Construction of the Advanced Water Purification Facility
April 4, 2011



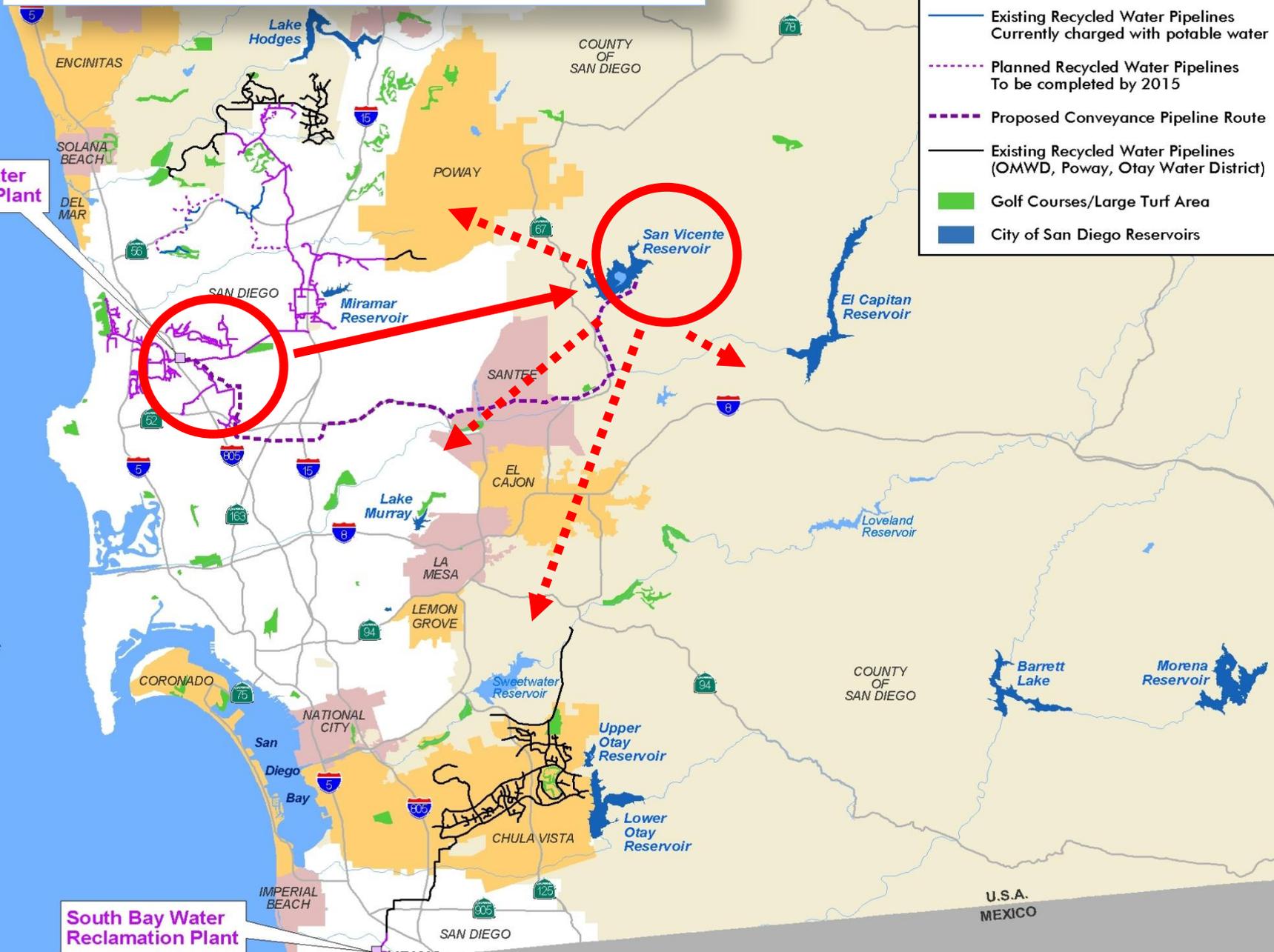
Demonstration Project Concept

LEGEND

- Existing Recycled Water Pipelines
- Existing Recycled Water Pipelines Currently charged with potable water
- Planned Recycled Water Pipelines To be completed by 2015
- Proposed Conveyance Pipeline Route
- Existing Recycled Water Pipelines (OMWD, Poway, Otay Water District)
- Golf Courses/Large Turf Area
- City of San Diego Reservoirs

North City Water Reclamation Plant

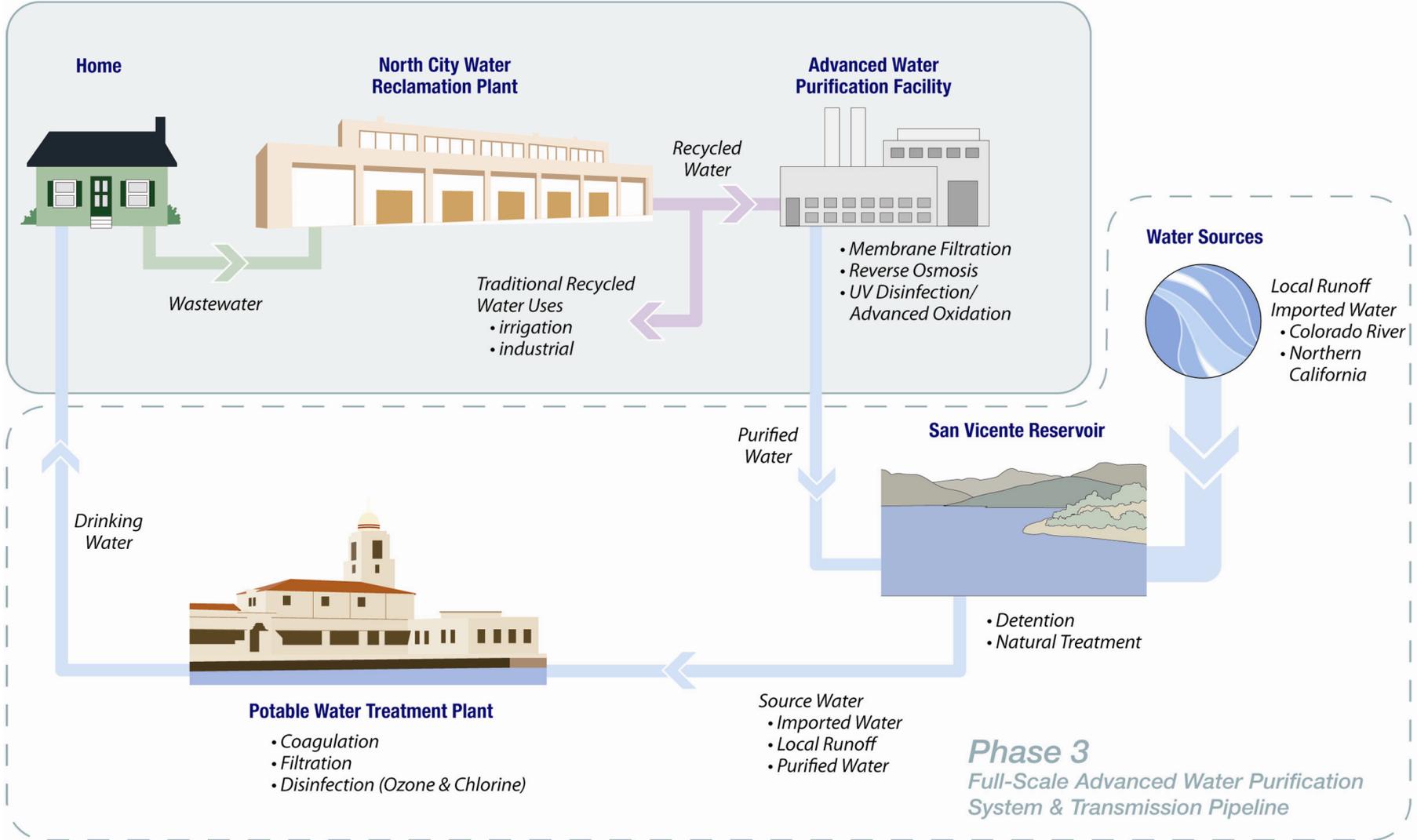
South Bay Water Reclamation Plant



City of San Diego's Water Purification Demonstration Project

Purification Process

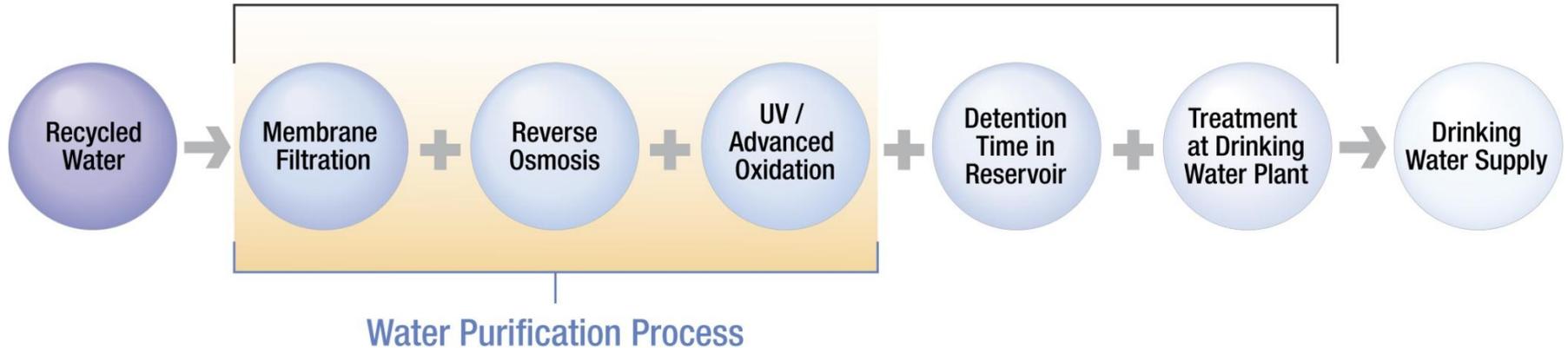
Phase 2 Demonstration-Scale Project





Water Purification Process

Multi-Barrier Water Purification Steps



Microfiltration & Ultrafiltration



Reverse Osmosis

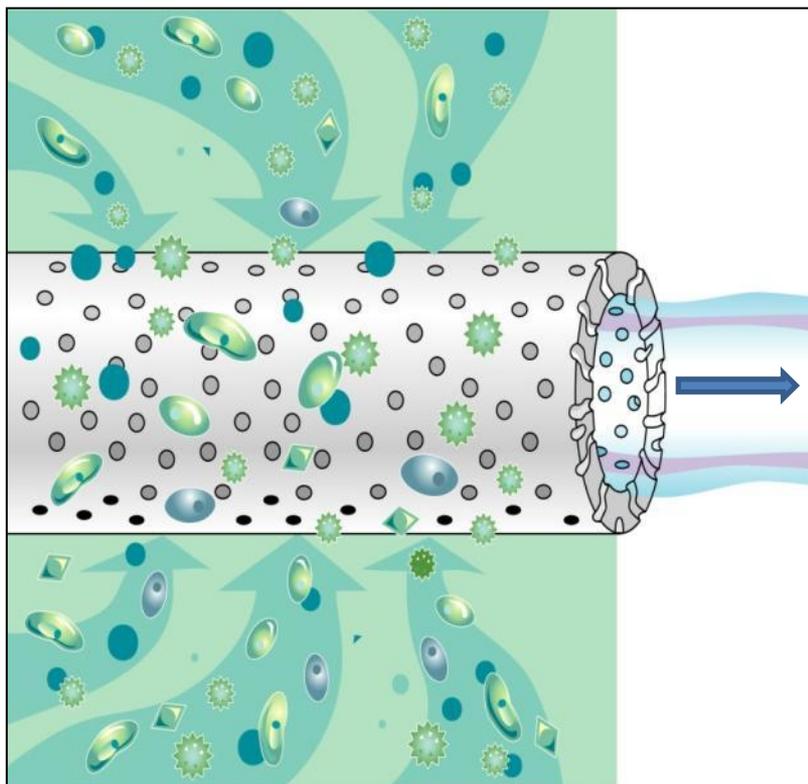


Ultraviolet Light / Hydrogen Peroxide





Membrane-filtration: Step One

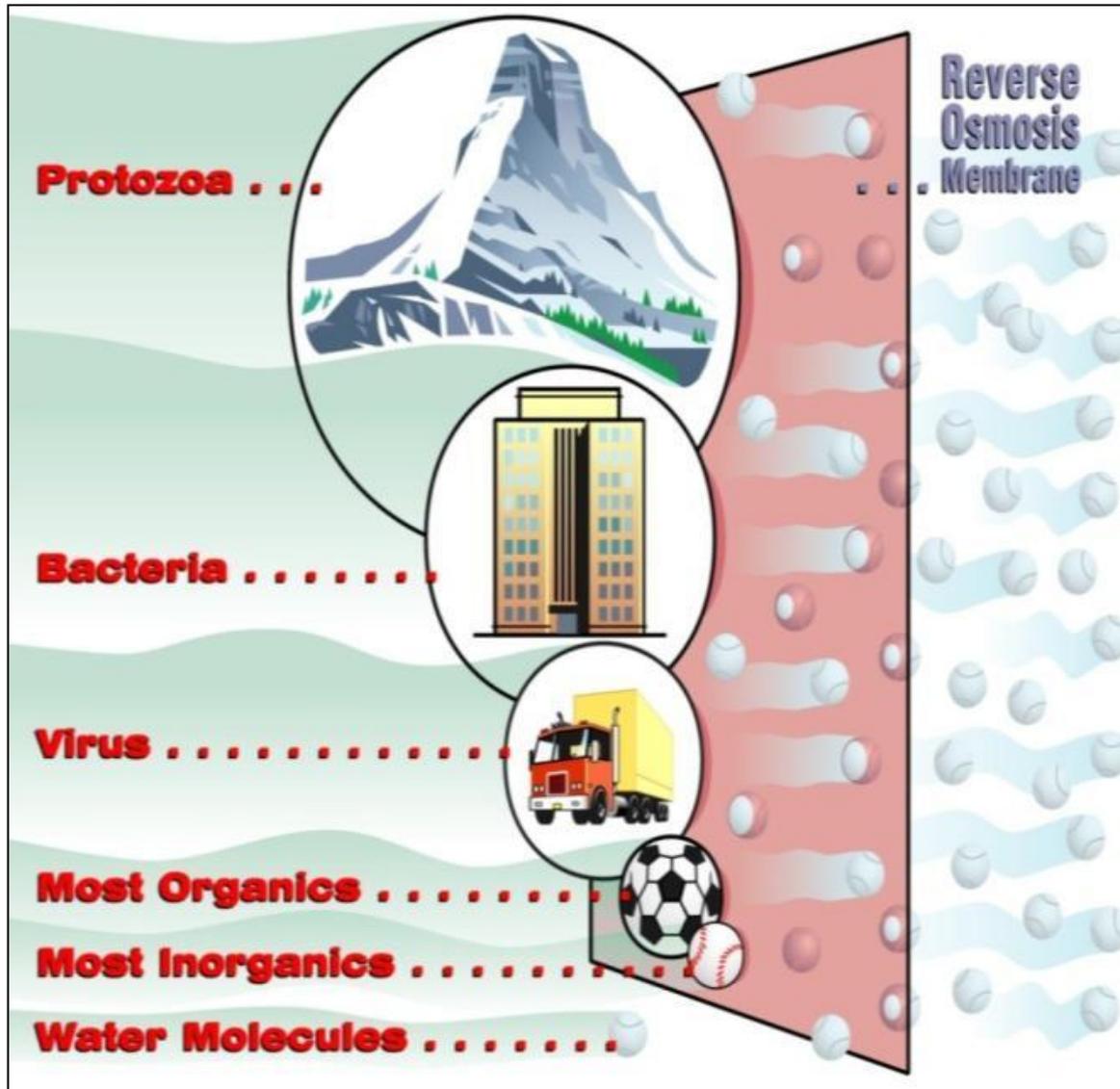


- Hollow fiber with holes in the sides
- Used to make baby food, purify medicines, fruit juices and more
- Excellent pre-filter before reverse osmosis





Reverse Osmosis: Step Two



- Same technology used by bottled water companies
- Forces water under high pressure through sheets of plastic membrane
- Demineralizes and purifies water



Ultraviolet Light plus H₂O₂: Step Three



- High-intensity light and hydrogen peroxide
- Creates advanced oxidation reaction, essentially destroys anything in the water





Water Purification: a proven technology



Orange County, California, 2008

Upper Occoquan Service Authority

Leader in Water Reclamation and Reuse

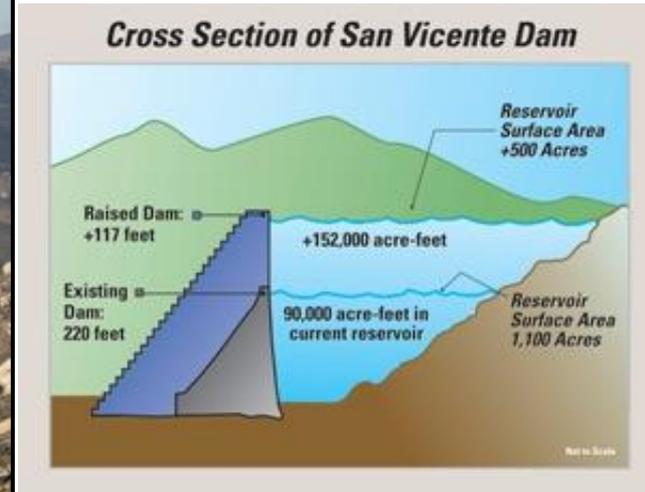


Fairfax County, Virginia, 1982





San Vicente Limnology and Reservoir Detention Study



- Dam to be raised 117 feet
- Currently 90,000 acre-feet

- After dam raise 242,000 acre-feet
- Construction duration 2009 – 2013
- Augmentation would improve water quality



Project Benefits

- Local and sustainable supply of drinking water
- Increased use of recycled water
- Decreased dependence on imported water
- Less energy than imported water
- Improved quality of reservoir water
- Positive impact on environment



Independent Advisory Panel



Panel includes:

- Ph.D's (9)
- Experts in water quality & treatment technology
- Experts in regulatory issues
- Local stakeholders
- O. C. Groundwater Replenishment System management



Independent Advisory Panel

- **George Tchobanoglous**, Ph.D., P.E., UC Davis
- **David R. Schubert**, Ph.D., Salk Institute for Biological Studies
- **Richard J. Bull**, Ph.D., Toxicologist, Mobull Consulting
- **Joseph A. Cotruvo**, Ph.D., Joseph Cotruvo Associates
- **James Crook**, Ph.D., P.E., Water Reuse
- **Richard Gersberg**, Ph.D., Occupational & Environmental Health, SDSU
- **Sunny Jiang**, Ph.D., Civil and Environmental Engineering, UC Irvine
- **Michael A. Anderson**, Ph.D., Environmental Chemistry, UC Riverside
- **Audrey D. Levine**, Ph.D., P.E., DEE, Drinking Water Research, U.S. EPA
- **Michael P. Wehner**, Assistant General Manager, OC Water District



Public Outreach & Education



- Speakers Bureau
- Community Events
- Facility Tours





Advanced Water Purification Facility

Open for tours
Summer 2011 – Summer 2012



Register online at www.PureWaterSD.org



Water Reliability Coalition



- BIOCOM
- Building Industry Association
- Building Owners and Managers Association
- Citizens Coordinate for Century 3
- Coastal Environmental Rights Foundation
- Endangered Habitats League
- Environmental Health Coalition
- Empower San Diego
- Friends of Infrastructure
- Industrial Environmental Association
- National Association of Industrial and Office Properties
- San Diego and Imperial Counties Labor Council
- San Diego Audubon Society
- San Diego Coastkeeper
- San Diego County Taxpayers Association
- San Diego Regional Chamber of Commerce
- San Diego Regional Economic Development Corporation
- San Diego River Park Foundation
- Surfrider Foundation, San Diego Chapter
- Sustainability Alliance of Southern California
- Utility Consumers' Action Network



Turning the Tide

2008...

The San Diego Union-Tribune.

UNION-TRIBUNE EDITORIAL

No toilet-to-tap

Special water rate hike unwarranted

September 8, 2008

High gasoline prices, rising food costs and upwardly adjustable mortgage payments may be sapping your paycheck, but they have not deterred the City Council from voting today on a special water rate hike for the infamous toilet-to-tap scheme.

At issue is an untested process to take sewage effluent, treat it heavily and then dump it into the San Vicente Reservoir, the source of much of San Diego's drinking water. This would mean, quite literally, taking your toilet water and returning it to your tap. Yet advocates of the plan abhor the apt toilet-to-tap sobriquet, preferring instead to call it "indirect potable reuse."

But no matter what euphemism you employ, the project is a colossal waste of ratepayer dollars and, just as important, fraught with serious public health concerns.

Over Mayor Jerry Sanders' well-justified veto, the City Council is rushing head long to build a \$12 million toilet-to-tap demonstration plant that may or may not meet the approval of the California Department of Health, which must sign off on it. Toward that end, the City Council will vote today on a special water rate increase of 2.3

...2011

Edward R. Moss
Publisher
Jeff Light
Editor



The Editorial Board
William Osborne, Editorial & Opinion Editor
Chris Reed, Editorial Writer
Don Sevrens, Editorial Writer
Steve Breen, Editorial Cartoonist

On Uniontrib.com

U-T Opinion online: uniontrib.com/news/opinion
Letters to the editor: letters@uniontrib.com
Steve Breen cartoons: stevebreen.uniontrib.com

EDITORIAL

THE YUCK FACTOR: GET OVER IT

As San Diego sprawls above 3.5 million people countywide in just 10 more years, and a projected 4.4 million by 2050, the greatest threat to our economic health and quality of life is an uncertain supply of water. This urban cul-de-sac at the bottom of California is at the tail end of the pipelines that deliver 80 percent or more of our water. That means we are heavily dependent on the mercy of others, and that is not comforting.

San Diegans have more than proved themselves willing to conserve; the city uses less water in real terms today than it did with a smaller population 20 years ago. That will continue to be a crucial part of the region's water strategy for decades. So, too, will be the development of new sources, such as desalination. And, of course, political battles to rescue the Sacramento-San Joaquin Delta from environmental collapse in order to keep Northern California water flowing south will be necessary.

scaping and industrial processes, then purify and scrub it some more to nearly distilled water standards. The demonstration project is to produce 1 million gallons a day for a year, during which it will be continually monitored and studied, but not distributed for public consumption. If it proves safe and affordable, the city could then consider its expansion to a permanent plant that could produce up to 16 million gallons a day, which would be piped to San Vicente Reservoir.

Frankly, there is not that much to demonstrate, at least scientifically.

Similar technology is already in large-scale use in Orange County, which produces 70 million gallons of purified wastewater each day, 6 million of which are piped to the county's aquifers to be used for irrigation.

Similar systems are also in use for...
for...
for...
for...

But the reality is...



What you should know...

- San Diego needs to develop local, reliable sources of water.
- Water Purification Demonstration Project is examining the use of advanced purified water.
- The purified water goes through multiple advanced treatment steps.
- No purified water will be added to the drinking water system during the Demonstration Project.



Information

Visit: www.purewatersd.org

Email: purewatersd@sandiego.gov

Call: (619) 533-7572



Water Purification Demonstration Project

Water Purification Demonstration Project Home

[News & Publications](#)

[General Information](#)

[Public Involvement](#)

[Independent Advisory Panel](#)

[Members](#)

[Links & Resources](#)

[Project Objective](#)

Evaluate the feasibility of using advanced treatment technology to produce water that can be sent to San Vicente Reservoir and later distributed as potable water. Determine if the Demonstration Project provides evidence of viability for a full-scale IP2RA project.

Water Purification Demonstration Project (In progress)

As part of the City's effort to provide a local and sustainable water supply, the Water Purification Demonstration Project is examining the use of advanced water purification technology to provide safe and reliable water for San Diego's future.

The Demonstration Project is the second phase of a process evaluating ways for the City to increase its use of recycled water. The first phase was the City's 2005 [Water Reuse Study](#) that identified reservoir augmentation as the preferred option for developing recycled water sources. The Demonstration Project will determine if reservoir augmentation is a feasible option for San Diego.

Funding for the Project was derived in part from a temporary water rate increase in effect from Jan. 1, 2009 until Sept. 1, 2010. The temporary increase raised \$10,550,477 of the total project cost of \$11,811,000. The remaining costs will be reimbursed by California Proposition 50 and U.S. Bureau of Reclamation grants. The temporary increase was originally 3.08 percent. This equates to a \$1.41 per month decrease in the bill of a typical single-family domestic customer using 14 HCF a month.

The Demonstration Project is under Advanced Water Purification Facility approximately one year and will provide San Vicente Reservoir is being considered to determine the viability of a full-scale project during the demonstration phase.

In an effort to keep San Diego citizens informed, the City's program will offer free tours of the Demonstration Project. Presentations will be made 533-7572 or email purewatersd@purewatersd.org

PureWaterSD.org



Receive Email Updates:

Enter email address

Subscribe Unsubscribe

SUBMIT

Water Purification Demonstration Project INFORMATION CARD



Please check all that apply:

- I am interested in the Water Purification Demonstration Project as a reliable local water source.
- I would like a project representative to make a presentation to my organization.
- I would like to receive periodic updates about the Demonstration Project.
- I support the City of San Diego pursuing the Demonstration Project.

Please send information to:

Name: _____ Organization: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ E-mail: _____

purewatersd@sandiego.gov • (619) 533-7572 • www.purewatersd.org

Water Reuse Program Water Purification Demonstration Project

The City of San Diego • Public Utilities Department

Fact Sheet

The City of San Diego has limited local water sources and relies on importing approximately 85 to 90 percent of its water supply. In the past, importing water from the Colorado River and Northern California has been a low-cost, reliable option, but environmental stresses and court-ordered pumping restrictions have constrained the amount of water that can be delivered to San Diego. These circumstances and the threat of further limitations on our water supplies have intensified the need for new sources of water. As part of the City's effort to provide a local and sustainable water supply, the Water Purification Demonstration Project is examining the use of advanced water purification technology to provide safe and reliable water for San Diego's future.

The Demonstration Project is the second phase of a process evaluating ways for the City to increase its use of recycled water. The first phase was the City's 2005 Water Reuse Study that identified reservoir augmentation as the preferred option for developing recycled water sources. The Demonstration Project will determine if reservoir augmentation is a feasible option for San Diego.

FAQs

Water Purification Demonstration Project

The City of San Diego • Public Utilities Department

Does San Diego need more water?

Water is essential to our quality of life. The City of San Diego imports approximately 85 to 90 percent of its water supply from Northern California and the Colorado River. For the past few years, California and regulatory agencies have imposed a drought on the Colorado River. In the past few years, San Diego has had to restrict its water use to protect endangered species in the Sacramento-San Joaquin Delta. Population projections predict the City will need more water in the future than it can produce. Since San Diego is at the end of the imported water pipeline, and reserves an average of 10 inches of rain each year, we need to develop all possible local water supplies to secure a reliable supply of water for present and future residents and businesses in San Diego.

Why can't we just conserve more water?

Using less water through conservation should always be the first step in protecting our local water supply. The City's conservation programs have helped reduce our dependence on imported water by saving more than 33,000,000-gallons of water a year, which is enough to meet the needs of around 66,000 typical families for a year. However, while conservation is important, efforts to save water need to be combined with other sustainable strategies to meet San Diego's water needs in the future.

Doesn't the City already recycle water?

Yes. The City of San Diego operates two state-of-the-art water recycling facilities capable of producing close to 43 million gallons a day of recycled water for irrigation and industrial purposes. Recycled water distribution requires a separate pipeline system of purple pipes to distinguish them from drinking water pipelines. The city's recycled water system continues to expand. However, using recycled water for irrigation is seasonal and the excess water is discharged into the ocean during rain periods. Constructing the purple pipe distribution system is also costly so the City is examining other ways to use more recycled water including reservoir augmentation.

Does the City have a recycled water use plan?

Yes, the City has a recycled water master plan and is always looking for ways to reuse existing water supplies. In 2003 the City conducted a comprehensive, balanced, impartial and science-based Water Reuse Study of all recycled water opportunities. The study included a public participation component and concluded that Indirect Potable Reuse or Reservoir Augmentation was the preferred method of implementing the expanded use of recycled water in San Diego.

What has been done since the 2005 Water Reuse Study?

The Water Reuse Study was the first phase of the City's plan to expand the use of recycled water. The second phase is now underway to examine the feasibility of reservoir augmentation through a Demonstration Project.

What is Reservoir Augmentation?

Reservoir augmentation is a multi-step process that is being examined by the Water Purification Demonstration Project. It includes using advanced water purification processes on recycled water which can be blended with existing "raw" water supplies. The Demonstration project will use treated recycled water as a local reservoir. The concept of Reservoir Augmentation is to add purified recycled water to a local reservoir which can be treated to drinking water standards and distributed to the public.

City of San Diego Public Utilities Department • Long Range Planning & Water Resources Division
800 B Street, Suite 600, San Diego, CA 92101 • (619) 533-7572 • www.purewatersd.org