



# 2014 WESTCAS Annual Conference



## Water Purification Demonstration Project

Goldamer Herbon, Senior Water Resources Specialist  
June 20, 2014





# TWEET Us!



**@PureWaterSD**

***#PotableReuseSD***



# CITY OF SAN DIEGO

- Provides water, waste-water and recycled water services
- Water demand ~ 180 MGD
- Water meter connections – 280,000
- Complex potable system with more than 3,300 miles of water lines
- 9 Reservoirs
- 3 Water Treatment Plants



# CURRENT SOURCES OF WATER SUPPLY



**Imported Water**  
(Colorado River &  
State Water Project)



**Local Reservoirs**  
(runoff capture)

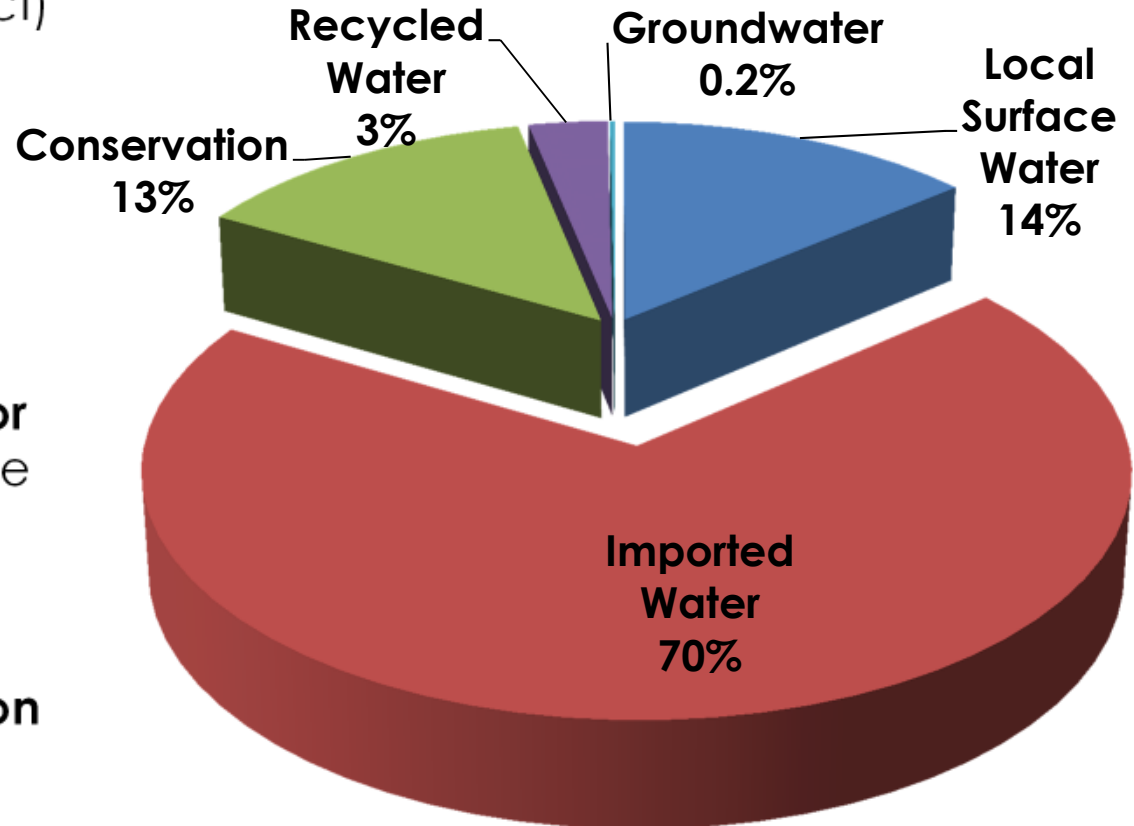


**Recycled Water for  
Non-Potable Reuse**

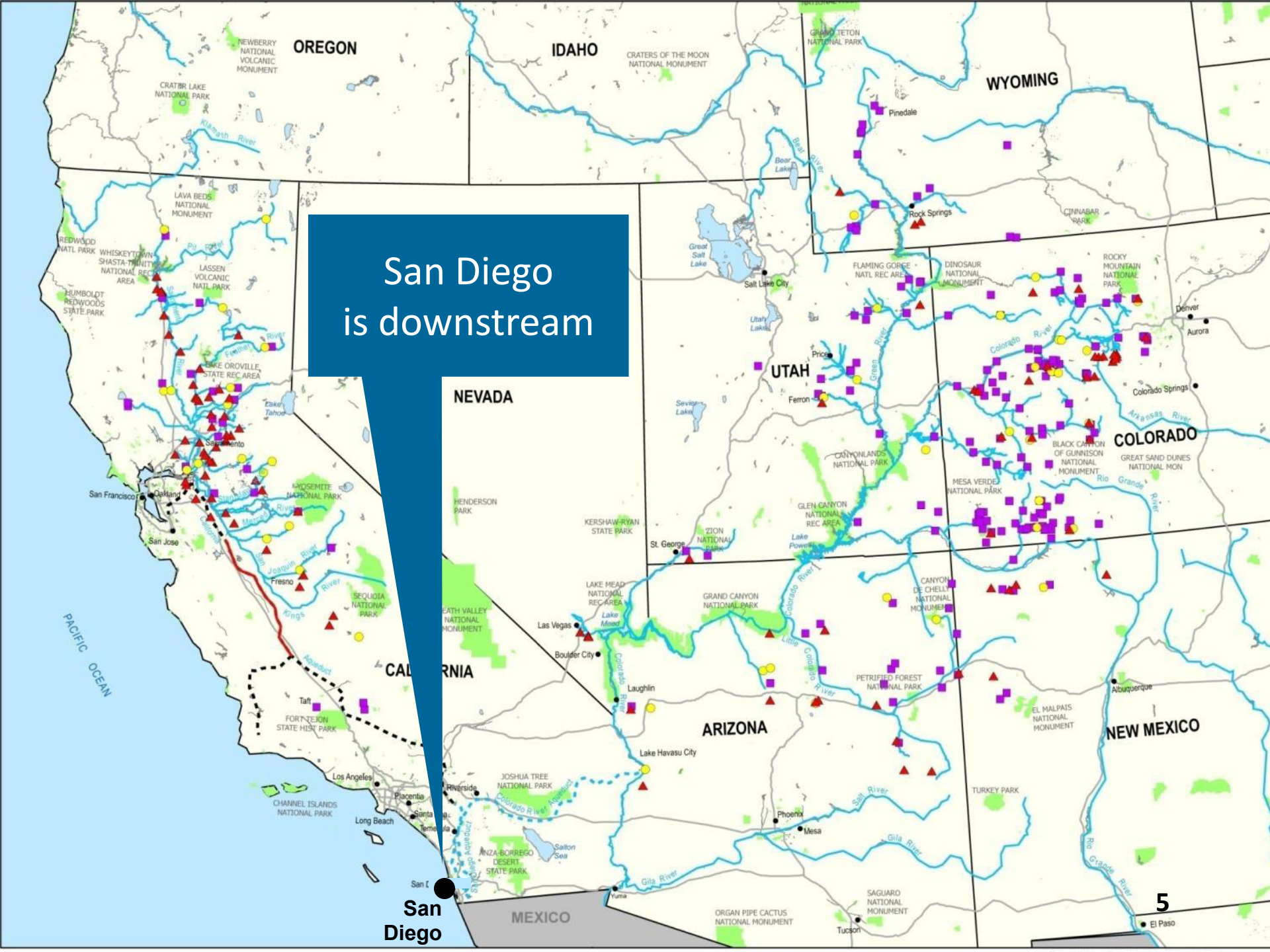


**Water Conservation**

**Water Supply Sources (FY 2013)**



San Diego  
is downstream





# WATER SUPPLY CHALLENGES

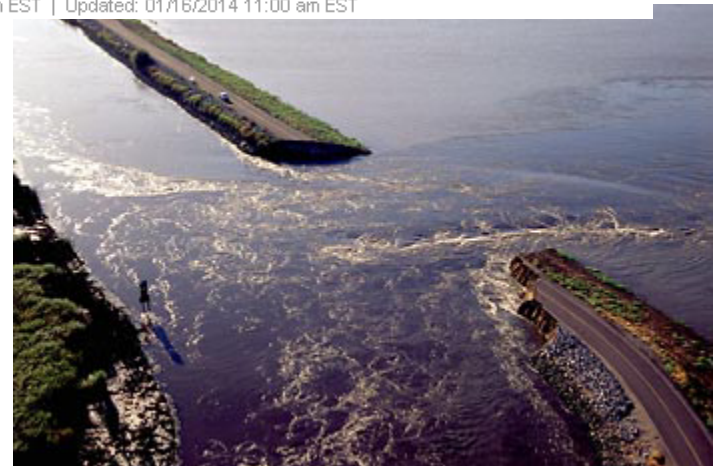
- Imported water reliability
- Limited local supplies
- Natural disasters
- Increasing costs
- Population growth
- Climate Change



## California Has Driest Year Ever -- And It May Get Worse

The Huffington Post | By Robin Wilkey 

Posted: 01/15/2014 10:10 pm EST | Updated: 01/16/2014 11:00 am EST





THE CITY OF SAN DIEGO



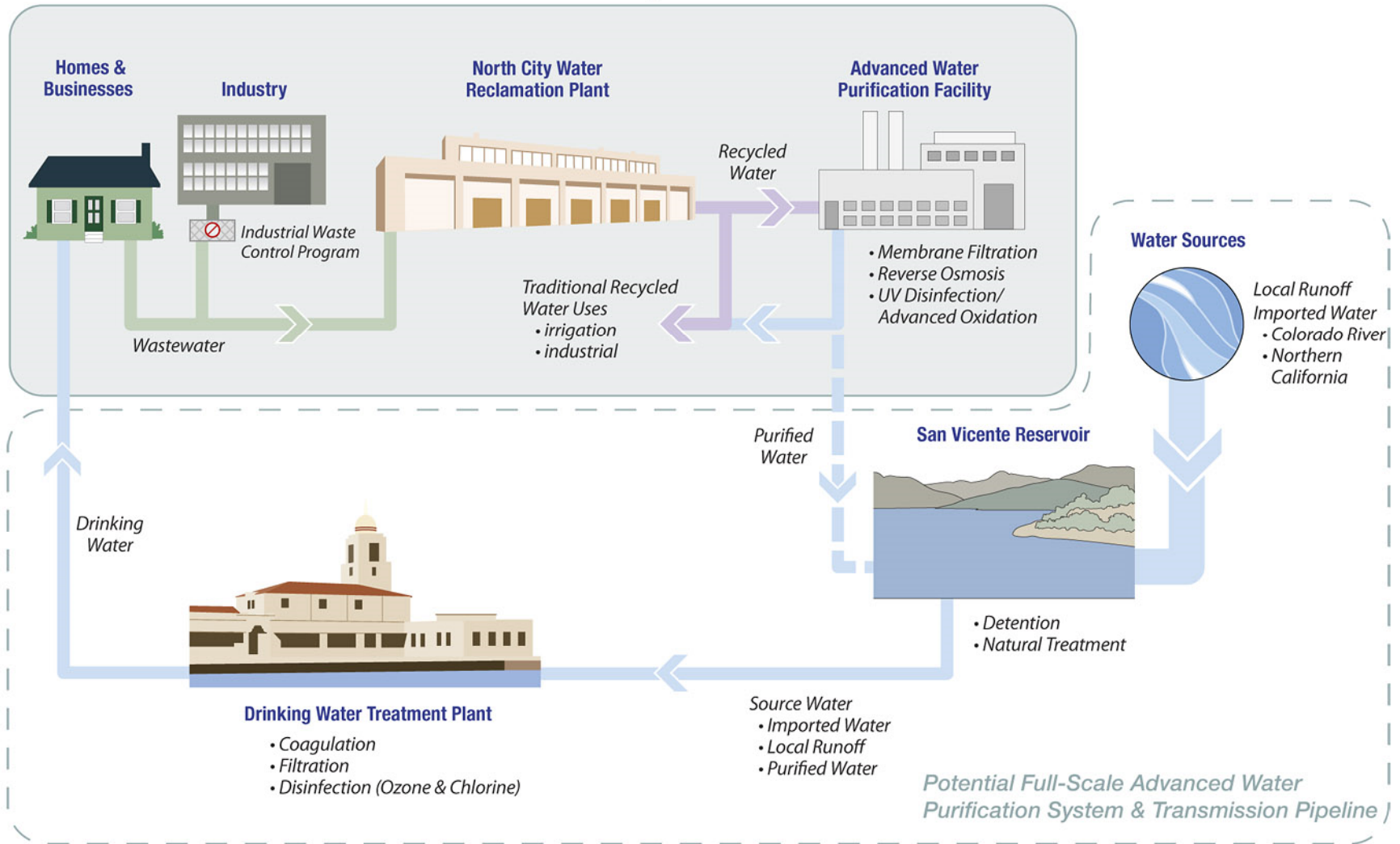
# Water Purification | Demonstration Project



# City of San Diego's Water Purification Demonstration Project

## Purification Process

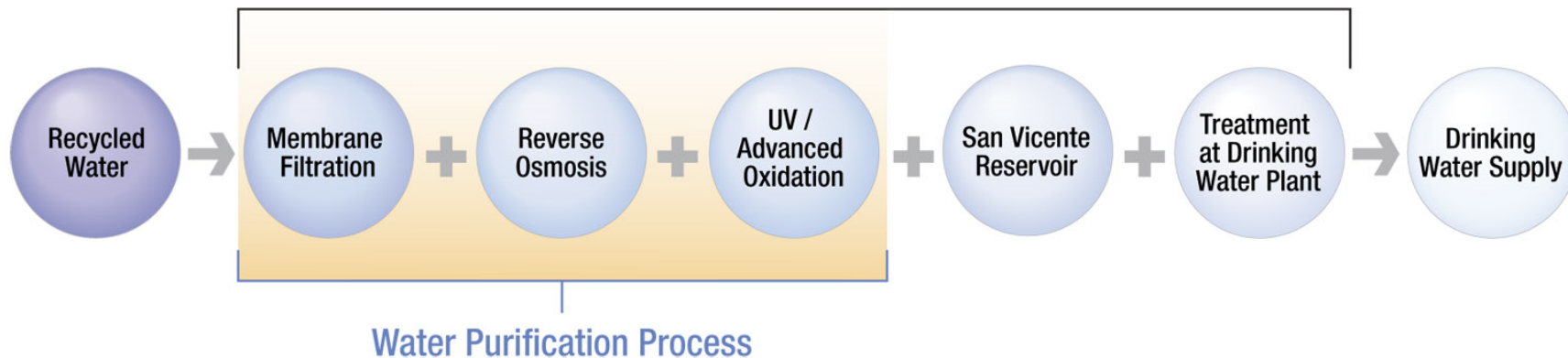
*Demonstration-Scale Project*





# WATER PURIFICATION PROCESS

## Multi-Barrier Water Purification Steps



### Microfiltration & Ultrafiltration



### Reverse Osmosis



### Ultraviolet Light / Hydrogen Peroxide





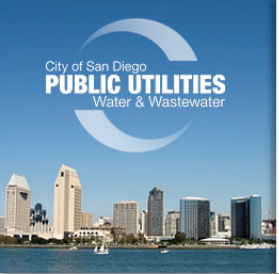


THE CITY OF SAN DIEGO



# Regulatory Framework





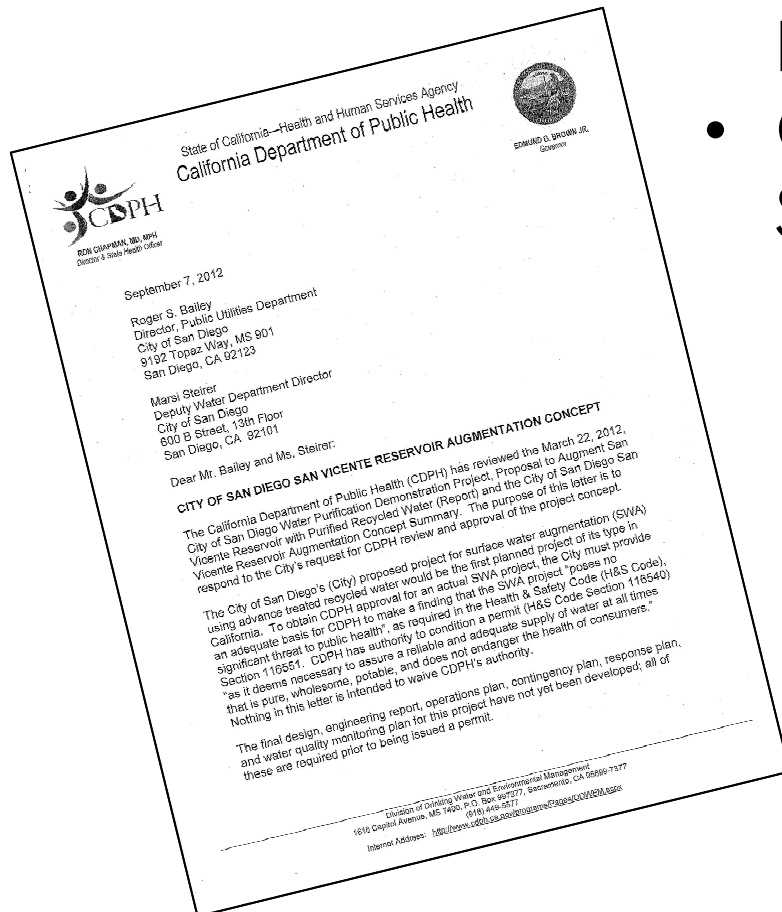
# AWP Facility Testing & Monitoring Plan Results

- Met all federal and state drinking water standards
- Continuous and daily monitoring verified the integrity of the treatment process and equipment
- Lab tests plus continuous monitoring ensures only high quality water is produced
- Water quality comparable to Orange County's Groundwater Replenishment System



# CALIFORNIA DEPARTMENT OF PUBLIC HEALTH CONCEPT APPROVAL

- City submitted concept proposal in March 2012
- Concept approval letter September 7, 2012



*“Based on CDPH’s review of the City’s ... submittal ... CDPH approves the San Vicente Reservoir Augmentation Concept.”*

# REGIONAL WATER BOARD

- Concept concurrence letter received by the City February 2013

*Regional Water Board "... supports efforts to develop the Reservoir Augmentation Project at San Vicente Reservoir."*

*"The ... Water Board, with concurrence from USEPA, strongly supports the efforts of the City to develop the San Vicente Reservoir Augmentation Project..."*

## CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

RESOLUTION NO. R9-2011-0069

### A RESOLUTION IN SUPPORT OF THE CITY OF SAN DIEGO'S SAN VICENTE RESERVOIR AUGMENTATION PROJECT

WHEREAS, the California Regional Water Quality Control Board, San Diego Region (hereinafter, San Diego Water Board), finds that:

1. California Water Code section 13510 states, the people of the state have a primary interest in the development of facilities to recycle water containing waste to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the state.

2. The Strategic Plan Update 2008-2012 includes a priority to increase sustainable local water supply for meeting existing and future beneficial uses.

3. The City of San Diego (City) has identified non-potable reuse of recycled water in the City's Master Plan and identifies as their preferred IPR strategy.

4. To determine the feasibility of San Diego is currently planning to construct a full-scale treatment plant to provide safe and reliable water for use in the City's current treatment plant pipeline to transport water to the City's current health and safety reservoir.

5. The San Diego Water Board, with concurrence from USEPA, strongly supports the efforts of the City to develop the San Vicente Reservoir Augmentation Project and concurs with the City's preferred NPDES permit pathway described in the Report. The San Diego Water Board has prepared the following comments, in consultation with USEPA, regarding the City's preferred NPDES permit pathway for the Project.

1. Modification of the San Diego Water Board's Basin Plan should not be necessary to prescribe an effluent limitation for nitrogen based on a ratio of nitrogen to phosphorus (N:P ratio) that accounts for the specific water quality factors relevant to the expanded San Vicente Reservoir. The Report indicates the City is projecting the advanced water treatment process discharge will comply with the Biosynthetic Substances total phosphorus water quality objective by a significant margin. With respect to nitrogen, the



February 7, 2013

Ms. Marie A. Steier  
Deputy Director, Public Utilities Department  
City of San Diego  
600 B Street, Suite 600, MS 906  
San Diego, CA 92101

In reply refer to:  
24001001

Ms. Steier:

The City of San Diego (City) submitted, for review and comments, a technical report dated August 2012 entitled, *Proposed Regional Water Quality Control Board Compliance Approach, Final Draft (Report)*. The City is proposing an Indirect Potable Reuse/Reservoir Augmentation Project that would supplement the approximately 240,000-acre-foot San Vicente Reservoir with up to 15,000 acre-feet per year (AFY) of purified recycled water produced at a full-scale advanced water treatment facility to be sited at the City's North City Water Reclamation Plant (NCWRP) (hereinafter Project). The Report examines key water quality regulations, permitting issues, and other factors that could affect the timeline for issuance of a National Pollutant Discharge Elimination System (NPDES) permit for discharging purified recycled water into San Vicente Reservoir. The City requested that San Diego Water Board coordinate with the U.S. Environmental Protection Agency, Region 9 (USEPA) in reviewing the Report to determine whether the Board can move forward with implementing attainable NPDES permit requirements for the City's Project without the need for (1) revision of the Clean Water Act (CWA) section 303(d) impairment listings for the San Vicente Reservoir, or (2) modification of the Water Quality Control Plan for the San Diego Basin (Basin Plan).

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THE CITY OF SAN DIEGO

# Public Outreach & Education Program



# COMMUNITY ENGAGEMENT

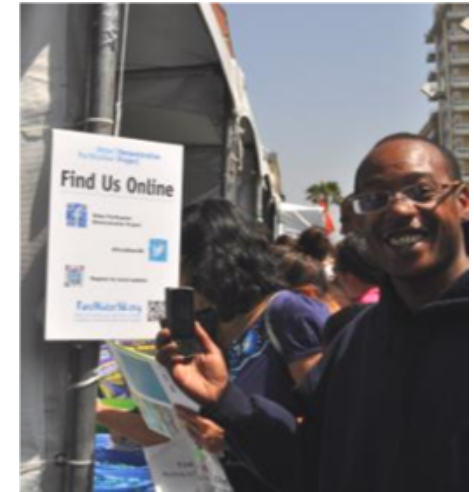
## Community Events



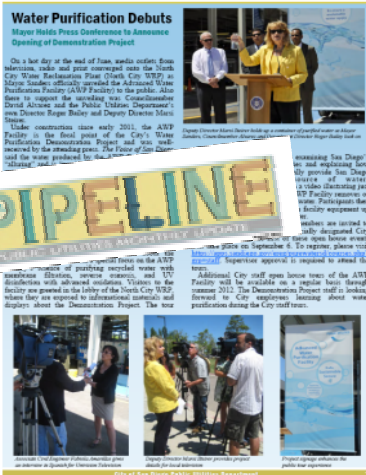
## Facility Tours



## Social Media



## Internal Communications





# YOUTH CONNECTION

- Project SWELL
- San Diego Youth Commission
- Boy Scouts/Girl Scouts of San Diego
- Children's AWP Facility Tours
- Community Events Catered to Kids







# PUBLIC OUTREACH & EDUCATION PROGRAM METRICS

Type of Event	Number of Events	Attendees
Speaker's Bureau	206	6,175
Community Events	72	9,189
Facility Tours	357	5,120





# WATER RELIABILITY COALITION



*Friends of Infrastructure*



CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY  
SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD



San Diego and Imperial  
Counties Labor Council





# MEDIA COVERAGE



## COVER STORY From toilets to tap

As water becomes more precious, more drinking water will come from treated sewage. Here's how it works.



By Kathy Chen  
for USA Today

Edward R. Mass  
PUBLISHED  
JAN 11, 2011  
12:22

**THE SAN DIEGO**  
**U-T**  
**UNION-TRIBUNE**

The Editor  
John J. ...  
On Thursday  
12:22 PM  
12:22 PM

## THE YUCK FACTOR: GET OVER IT

As the city's population grows, so do the people's expectations for clean, pure water. And it's not just for the sake of the glass, but for the sake of the glass. The city's water is not just for the sake of the glass, but for the sake of the glass. The city's water is not just for the sake of the glass, but for the sake of the glass.

**SIGNON**  
**SAN DIEGO**

## Wastewater getting new life across county

Drought has been leading for San Diego County residents, but lessons of the past pushed utility leaders across regions toward an unprecedented array of projects to use sewage for irrigation, industry and even drinking water.

The concept goes back decades and it's been embraced in places without coming potential. The untapped possibilities are prompting engineers to treat wastewater rather than a liability and likely will mean expensive — and expensive — forays

Think of it as the dawn of a new era in which every drop of sewage is scrutinized



Reverse osmosis tubes are a critical part of San Diego's attempt to purify wastewater so that it meets

## The New York Times

FRIDAY, FEBRUARY 11, 2011

## As 'Yuck Factor' Subsides, Treated Wastewater Flows From Taps

**By FELICITY BARNHART**  
SAN DIEGO — Almost hidden in the Southern hills, the plant wastewater treatment plant here does not seem like a place where the city's water is not just for the sake of the glass, but for the sake of the glass. The city's water is not just for the sake of the glass, but for the sake of the glass.

## The New York Times Sunday Review | The Opinion Pages "Taking the Waste Out of Wastewater"



## SCOOP SAN DIEGO

## San Diego City Council Approves Water Purification

Water Reliability Coalition says new safe, reliable drinking water could supply up to 40 percent of City of San Diego's demand

## HUFFPOST GREEN

Jim Lauria  
Vice President of Marketing and Business Development for Amiad Fil

## The Emotion of Wastewater

Posted: 06/12/11 09:28 PM ET

## TIME Breaking the Taboo on "Toilet to Tap"

Posted by BRYAN WALSH Wednesday, August 10, 2011 at 12:28 pm  
11 Comments • Related Topics: water, climate change, desert, drought, south, southwest, texas, water, water recycling



## More from TIME: Drought Cripples the South

Natural disasters will make people a little more receptive to out-of-the-box ideas than they might otherwise be. But really, recycling water—even if it is toilet-to-tap—is something we should all be ready to embrace, especially in the arid West. Putting aside this year's record-breaking drought, more and more people are moving to the dry areas of the West and the Southwest—to cities like Austin, San Antonio, Phoenix and Las Vegas. Even if severe droughts like this one stay relatively rare—and climate change doesn't intensify the region's aridity, as predicted to do—more people will be using more water in places that simply don't have a something has to give.

## in TIME: The Great Dry State of Texas

ries have long recycled water for certain uses—calling it grey water—like watering lawns and landscaping. But as William Winesap, director of the Texas Water Resources Institute, says: "It's not just for the sake of the glass, but for the sake of the glass."

## Can San Diego Go From Toilet to Tap?

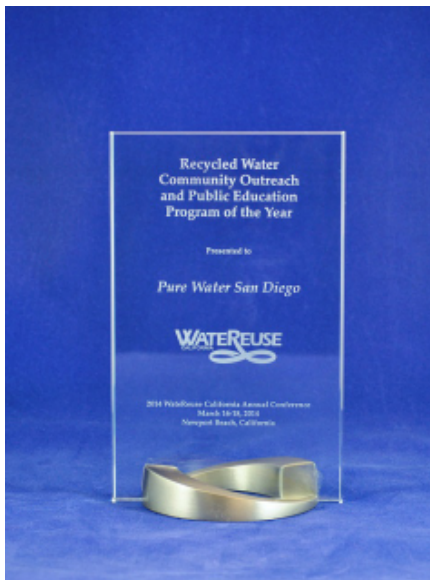
Sanders proposes plan to turn wastewater into drinking water  
By Lauren Ramsey | Thursday, Jan 20, 2011 | 10:00 AM PST



與大地同體 和社會共生  
陳甲上鄉土畫首次美國展

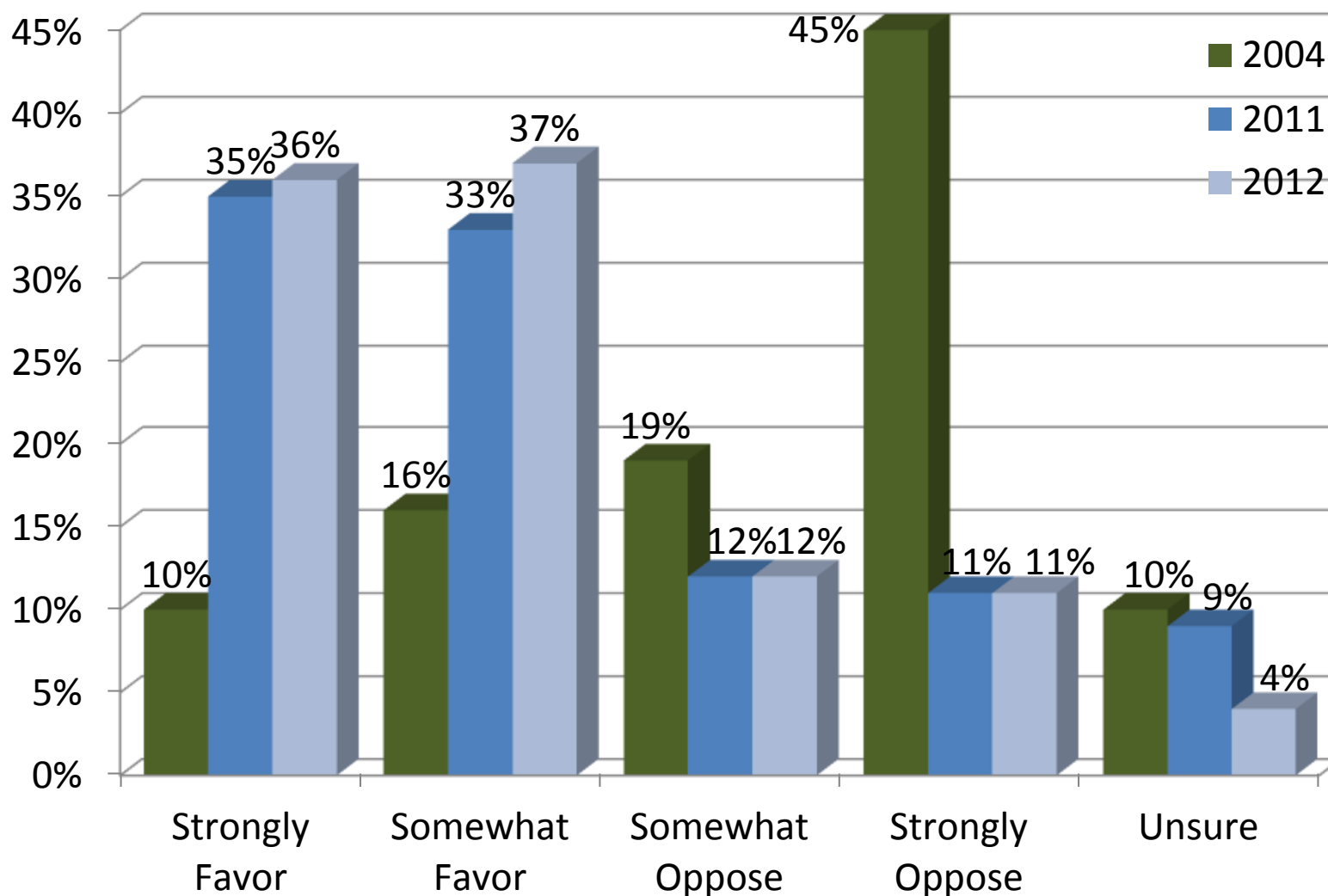
真善忍廉博德和公平

# PUBLIC OUTREACH & EDUCATION PROGRAM AWARDS & RECOGNITION





# OUTREACH & EDUCATION PROGRAM RESEARCH RESULTS





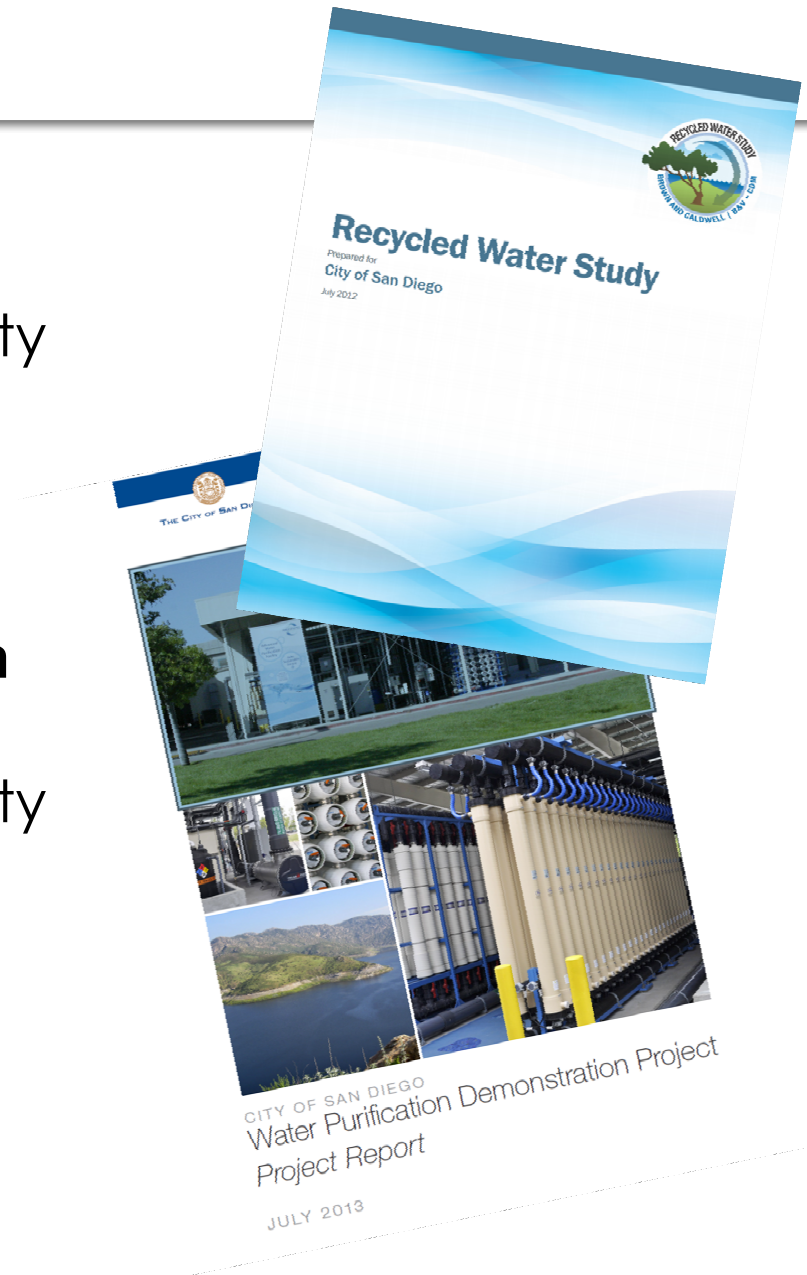
# REUSE REPORTS

## Recycled Water Study

- Final report adopted by City Council on July 17, 2012

## Water Purification Demonstration Project Final Report

- Final report adopted by City Council on April 23, 2013

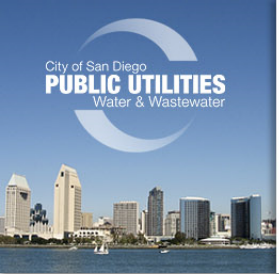


# RECYCLED WATER STUDY (2012)

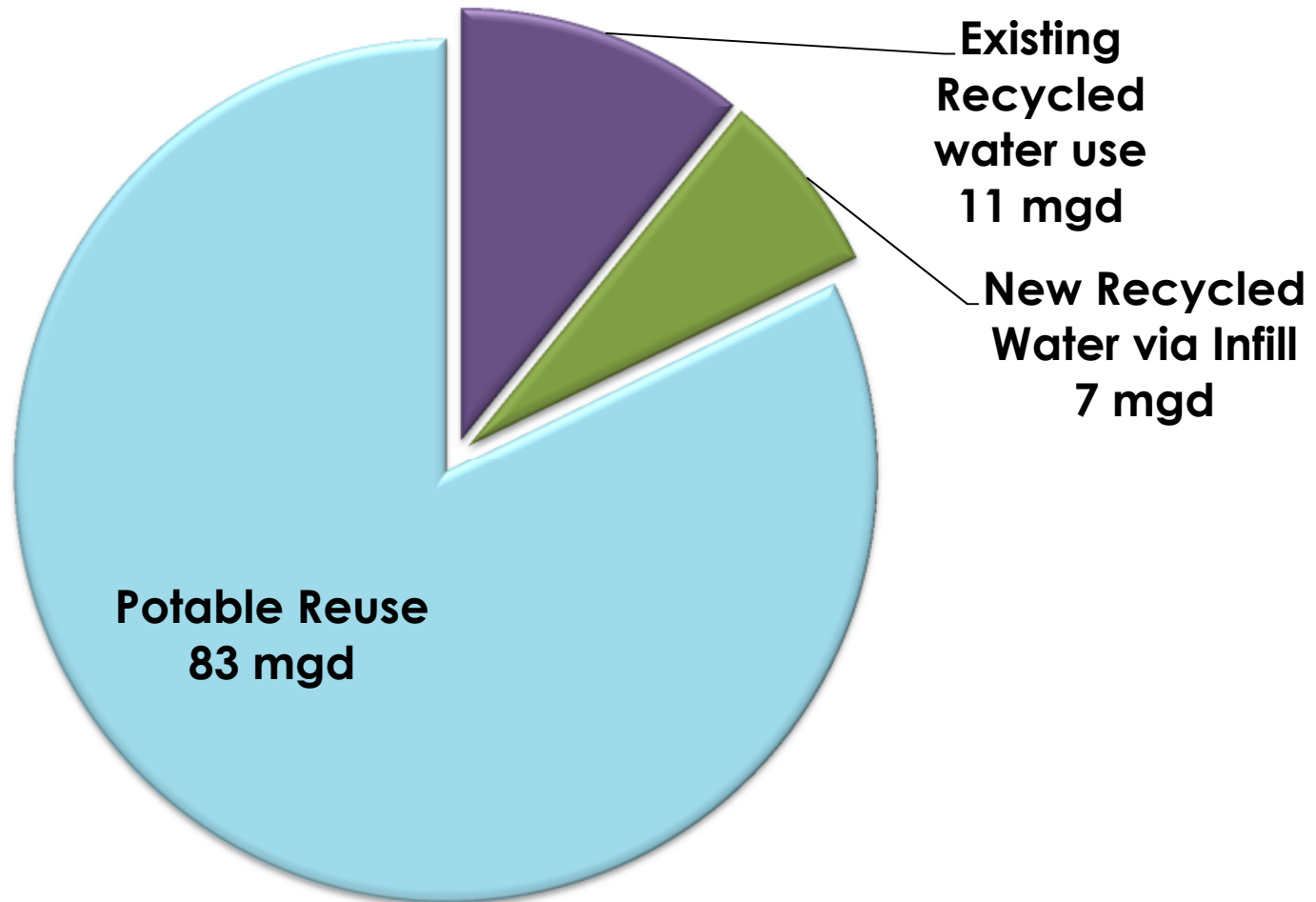
- Identified alternatives for maximizing water reuse
- Potable reuse found to be the most effective strategy for maximizing recycling
- Recycled water (purple pipe) system expansion
  - high cost for the nominal increase in use
- City Council unanimously adopted the study and directed staff to prepare an implementation strategy







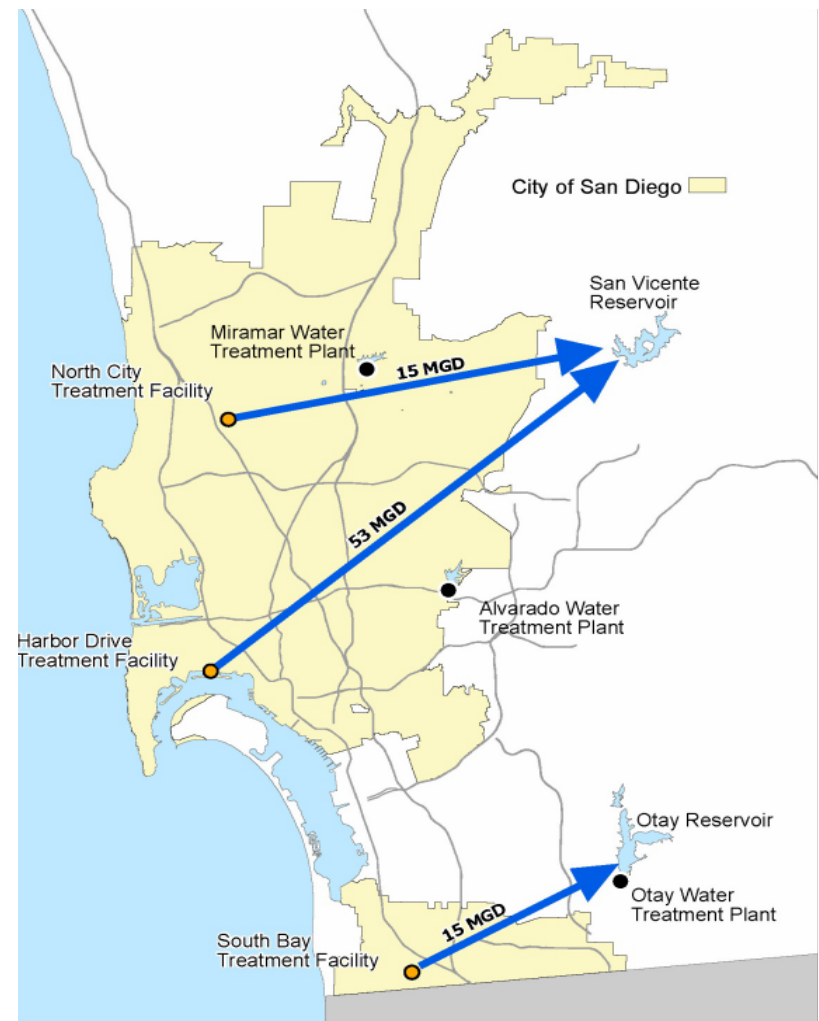
# Recycled Water Study

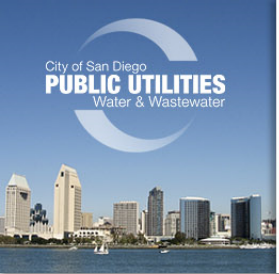


101 mgd total reuse

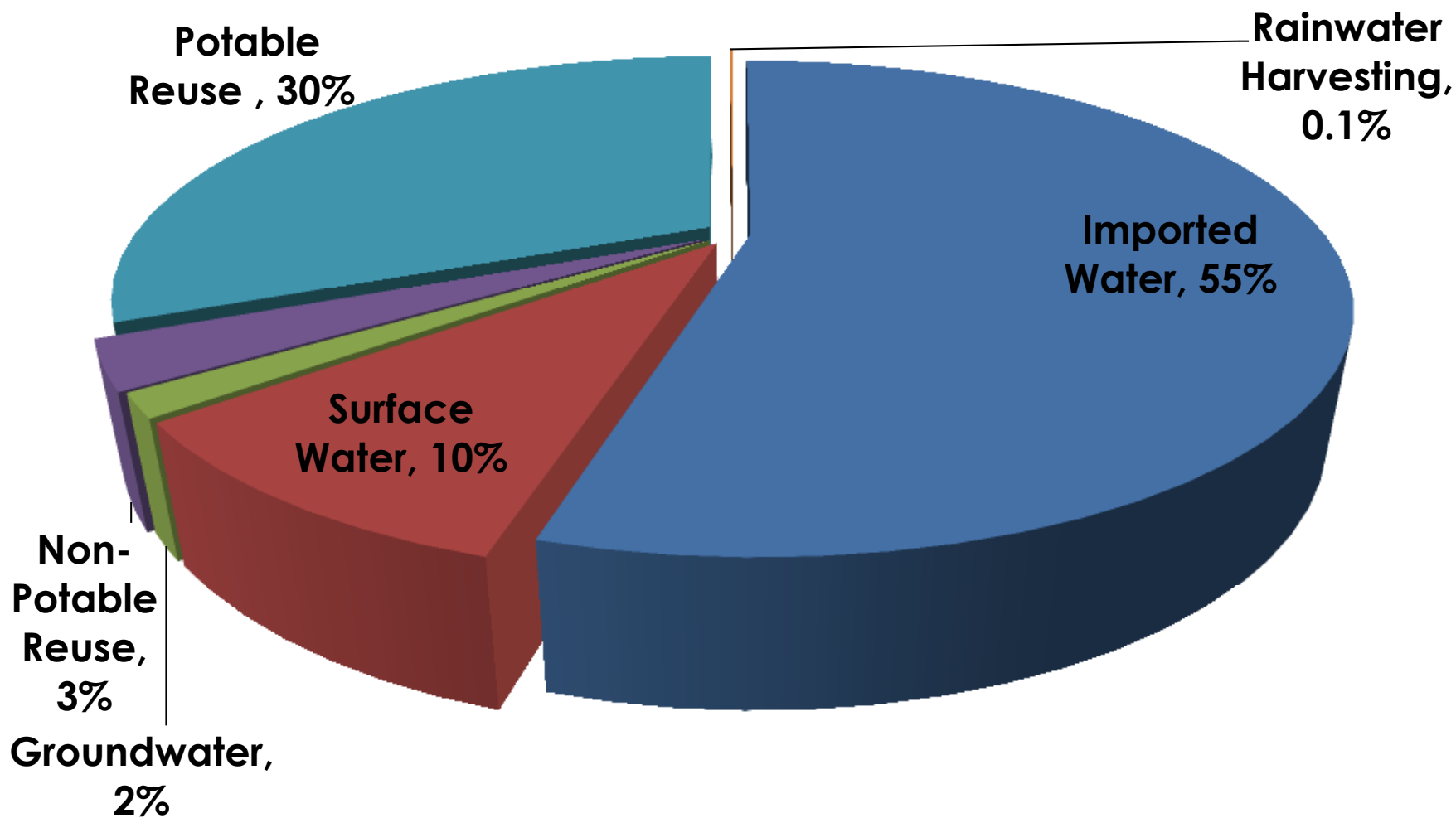
# Pure Water Facilities Plan

- Initial Phase
  - 15 mgd by 2023
- Future Phase
  - 83 mgd by





# FUTURE SOURCES OF WATER SUPPLY 2035



# Pure Water San Diego

- A 20-year program to provide a safe, secure, and sustainable local drinking water supply
- Our purest source of raw water
- Reliable and locally controlled
- Drought proof, climate independent
- Decreases reliance on imported water



# INFORMATION

Visit: [www.purewatersd.org](http://www.purewatersd.org)

Email: [purewatersd@sandiego.gov](mailto:purewatersd@sandiego.gov)

Call: (619) 533-7572

The screenshot shows the homepage of the Pure Water San Diego website. At the top is a banner with the San Diego skyline and the text "Water A Branch of Public Utilities". Below this are navigation tabs: "WATER HOME", "GENERAL INFO", "LAKES AND RECREATION", "WATER & SEWER BILL/RATES", "WATER CONSERVATION", "RECYCLED WATER", "WATER QUALITY", "INFRASTRUCTURE IMPROVEMENTS", and "PURE WATER SAN DIEGO". The main heading is "Pure Water San Diego". Below it, a paragraph states: "Pure Water San Diego is the City's phased multiyear program to provide a safe, secure and sustainable local drinking water supply for San Diego. Recycled water will be turned into drinkable water through the use of water purification technology. The program will make San Diego more water independent and more resilient against drought, climate change and natural disasters." To the right of this text is a diagram titled "Water Purification Process" showing the flow from "Drinking Water Treatment Plant" to "Advanced Water Purification Facility" and then to "San Vicente Reservoir". Below the diagram is a section titled "A demonstration project (2009-2013) confirmed the City can produce purified water that meets all federal and state drinking water standards." followed by a list of program components: "Pure Water San Diego Program", "Water Reuse Study", "Market Purification Demonstration Project", "General Information", "News and Publications", "Overview", "Public Involvement", "Public Connection", "Awards and Recognition", "Links & Resources", and "Reports". At the bottom left is a "Keep Me Informed" section with a text input field for an email address and a "Join" button. On the right side of the page are links for "PureWaterSD.org", "FOLLOW US ON" (Facebook, Twitter, YouTube), "TOUR THE ADVANCED WATER PURIFICATION FACILITY", "REQUEST A PRESENTATION", "Project Reports", and a "Watch Video of Advanced Water Purification Facility" link.

The screenshot shows a "Fact Sheet" for Pure Water San Diego. At the top, it says "The City of San Diego • Public Utilities Department". The main heading is "Pure Water San Diego". Below this, a paragraph states: "San Diego is the eighth largest city in the United States with a population of approximately 1.3 million. With little rain and limited local water supplies San Diego depends on importing 85 percent of its water from the Colorado River and Northern California. San Diego must develop a local source of drinking water to lessen dependence on imported water, keep up with population growth and combat water supply reliability challenges." To the right of this text is a photograph of the "Advanced Water Purification Facility". Below the photo is a paragraph: "Pure Water San Diego is the City's phased multiyear program to provide a safe, secure and sustainable local drinking water supply for San Diego. Recycled water will be turned into drinkable water through the use of water purification technology. The program will make San Diego more water independent and is an effective solution for increasing ocean environment protection and securing a modified permit renewal for the Point Loma Wastewater Treatment Plant." To the right of this text is a photograph of "Purified W. water". Below the photo is a paragraph: "The City conducted a demonstration project from 2009 to 2013 to explore the feasibility of implementing the same three-step water purification process that has been used successfully by the Orange County Water District since 2006. One million gallons of water were purified every day for a year at San Diego's Advanced Water Purification Facility." Below this text is a diagram titled "Multi-Barrier Water Purification Steps" showing the process: "Purified Water" → "Membrane Filtration" → "Reverse Osmosis" → "UV / Advanced Oxidation" → "San Vicente Reservoir" → "Transfer to the Point Loma Water Plant" → "Drinking Water Supply". To the right of the diagram is a paragraph: "More than 5,000 water quality tests ensured no contaminants were present in the water. The California Department of Public Health and the San Diego Water Board approved the City's concept of purifying water and sending it to the San Vicente Reservoir prior to treatment at a drinking water plant. The purified water meets all federal and state drinking water standards." At the bottom of the fact sheet is a section titled "Water Purification Process" with a link to "Learn more about Pure Water San Diego at [www.purewatersd.org](http://www.purewatersd.org). Register for a tour of the Advanced Water Purification Facility at [purewatersd.org/tours](http://purewatersd.org/tours) or request a presentation for your organization at [purewatersd.org/presentations](http://purewatersd.org/presentations). At the very bottom is contact information: "City of San Diego Public Utilities Department • Pure Water San Diego Program 325 S Street, Suite 300, San Diego, CA 92101 • (619) 583-7572 • [www.purewatersd.org](http://www.purewatersd.org)".



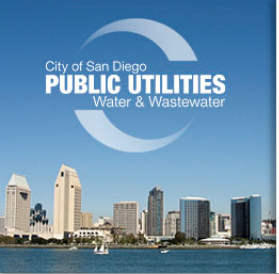
Pure Water San Diego



@PureWaterSD



purewatersd



# PURE WATER SAN DIEGO

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# QUESTIONS?