WATEREUSE ORANGE COUNTY Chapter Newsletter

Fall/Winter 2016

**IN THIS ISSUE:**



**NEXT MEETING**

Thursday, December 15
11:30 - 1:30 P.M.

**LOCATION:**

HDR - Irvine Office
3230 El Camino Real
Suite 200
Irvine, CA 92602

**MISSION STATEMENT**

*To advance the benefitcial and efficient uses of high-quality, locally produced, sustainable water sources for the betterment of society and the environment through advocacy, education, and outreach, research, and membership.*

# The Metropolitan Water District of Southern California's Regional Recycled Water Program

*by The Metropolitan Water District of Southern California / Sanitation Districts of Los Angeles County*

Debra Man, Assistant General Manager and Chief Operating Officer of the Metropolitan Water District of Southern California, gave a presentation about the proposed Regional Reycled Water Program at the WateReuse Orange County Chapter meeting on October 20, 2016.

The Metropolitan Water District of Southern California is exploring the potential of a water purification project to beneficially reuse water currently discharged to the Pacific Ocean to recharge regional groundwater basins. Under a partnership with the Sanitation Districts of Los Angeles County, Metropolitan would build a new purification plant and distribution lines to groundwater basins in Los Angeles and Orange counties. The program would represent the first in-region production of water by Metropolitan. Diversifying the region's water supply sources, advancing conservation and maintaining imported supplies are all part of Metropolitan's long-term Integrated Water Resources Plan.

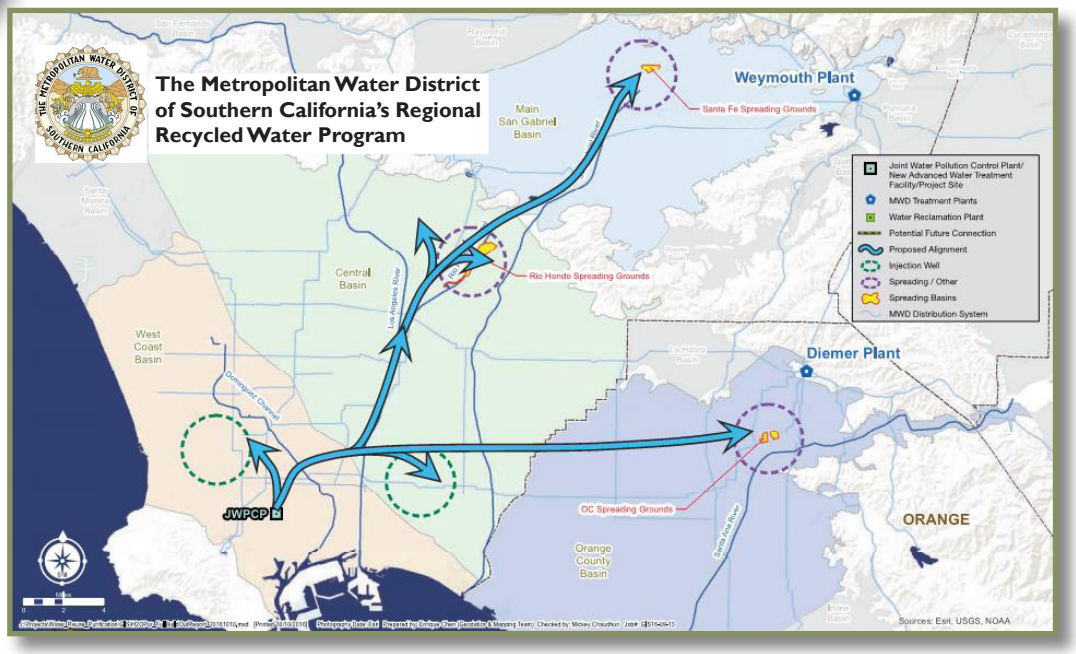
## Program at a Glance

Under the current program configuration, Metropolitan would purify water at the Sanitation District's Joint Water Pollution Control Plant in Carson, and replenish groundwater basins in Los Angeles and Orange counties. The initial program activities call for construction of a 500,000 gallon-per-day demonstration project at the plant site and feasibility studies.

The operational phase(s) of the program call for deliveries of up to 150 MGD (168,000 ac-ft per year) of purified water and the construction of up to 60 miles of distribution lines to convey the water to spreading basins and/or injection well sites in both counties. The program is being configured to ensure delivery flexibility to groundwater basins to meet the needs of Metropolitan's Member Agencies, groundwater basin managers and pumpers. The potential for shared use of public and private rights-of-way and operational facilities is also under consideration.

## Proven Safe Techniques

The project involves use of established technologies to purify non-nitrified secondary effluent and turn it into a

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# A Tale of Two States: Regulations Related to Direct Potable Reuse

*by Amber Baylor, Env. Specialist at South Orange County Wastewater Authority*


In 2002, staff at the Colorado River Municipal Water District (CRMWD) began to search for additional drinking water supplies to meet the demands of a growing population. Through a comprehensive technical review of the available water sources along with the evaluation of existing infrastructure in the area, the CRMWD decided to pursue what has become the first direct potable reuse (DPR) project in the United States in May of 2013. The ability of CRMWD to gain approval for the project provides a case study in the in the comparison of regulations to complete projects emerging for this new source of water in areas of water supply scarcity.

CRMWD is a water wholesaler who operates surface water reservoirs, dams, well fields and a raw water purification facility. The raw water supplied serves populations of approximately 450,000 people. The CRMWD is located in arid West Texas in the Permian Basin. This basin owes its name to the rich oil and natural gas deposits that accumulated in the area over 250 million years ago. Another geologic characteristic of the area is that it is rich in potassium salts which negatively affect the quality of groundwater.

The heavy brackish groundwater has historically caused taste complaints when surface water began to diminish due to drought. The DPR water was identified by residents as a cleaner supply. John Grant, General Manager for the CRMWD said that during public outreach projects the residents asked CRMWD staff "why shouldn't we (CRMWD) have done it sooner?" Water supply constraints are palpable for the residents who are accustomed to seeing aquifer reports on their daily news. Customer awareness as it relates to water supply is a key difference when comparing Texas to California and was a contributing factor for the full acceptance of DPR in Texas.

*Residents asked CRMWD staff "Why shouldn't we (CRMWD) have done it sooner?"*

The DPR water originates in the community of Big Spring, Texas (figure 1). The effluent from the wastewater treatment plant in Big Spring falls under the same type of NPDES regulations that California shares under the Clean Water Act. Texas specific regulations that govern the reclaimed water can be found in the Texas Water Code[1] and the Texas Administrative Code[2] that regulate the design, operation, and effluent quality requirements for the beneficial use of reclaimed water.

Approximately 2.5 MGD of tertiary effluent from the wastewater treatment plant serving Big Spring is diverted from environmental discharge to the raw water purification facility owned by CRMWD which utilizes microfiltration, reverse osmosis and an UV/$H_2O_2$ step combining disinfection, photolysis, and advanced oxidation. This is equivalent to the full advanced treatment (FAT) standard in California and was designed for 1.2-log destruction of N-Nitrosodimethylamine (NDMA) and, 0.5-log destruction of 1,4 dioxane, based on review of the Orange County Water District's Groundwater Replenishment System project. Subsequent studies during the plant's initial operation indicate that when coupled with the upstream wastewater treatmetn plant, the raw water purification facility likely achieves the 12-10-10 log removal of viruses, Cryptosporidium, and Giardia required in the State of California's Groundwater Recharge Reuse Project (GRRP) regulations, respectively. The product water is then blended into the raw water supply lines for the communities of Midland, Odessa, and Snyder. The blend changes seasonally and the purified water does not exceed 50% of the raw water volume.

The blended water meets the definition of direct potable reuse in Section 116275 of the Health and Safety Code of California as the raw water facility discharges the recycled water directly upstream of a water treatment plant. In California, this type of water rests on the far end of the potable water reuse continuum as identified in the recommendations from the DPR Advisory Group's report[3], where no regulations exist due to the lack of an environmental buffer. John Grant notes that CRMWD "traded time for technology" to ensure CRMWD was delivering a safe supply of drinking water. The question of safety and regulatory authority originates in the public use doctrines in each state.

California and Texas share in the balanced system of managing water under the public trust doctrines. The surface water in Texas can be used only with the permission of the State which is how the State viewed the transmittal of water in the DPR project. To adhere to this doctrine, a 'Reclaimed Water Authorization' permit was required to transfer water rights to CRMWD. The effluent discharge from the wastewater treatment plant would normally return as surface water to Beals Creek. The Texas Commission on Environmental Quality (TCEQ) issued the authorization permit to allow the transfer of water. The TCEQ is equivalent to the State Water Resources Control Board and the Department of Drinking Water (DDW) combined.

There are no specific regulations that existed at the time of the design, treatment or operation of the raw water purification facility in Texas and there are still no regulations that specifically address the DPR water. However the TCEQ does view this type of treatment "innovative or alternative" due to the membrane components and in order to ensure safety of the water CRMWD was required to adhere to the TCEQ's guidelines and to conduct a pilot study. The monitoring in the pilot study included: chemicals of emerging concern, steroids, total trihalomethanes, nitrosamines, perfluorinated chemicals, giardia, adenovirus/MS2, bacteriophage, Cryptospridum, Giardia, particle counts, e. coli, and coliform[4]. The membrane guidelines[5] issued by the TCEQ are similar to guidelines

1 Texas Water Code § 26.0271

2 30 TAC, Ch. 210 & 30 TAC 321, Sub Ch. P

3 A. (2016). Recommendations of the Advisory Group on Developing Uniform Water Recycling Criteria for Direct Potable Reuse (p35, Rep.). Fountain Valley, CA: National Water Research Institute

4 http://www.twdb.texas.gov/innovativewater/reuse/projects/CRMWD%20RWPF/index.asp

5 30 TAC §290.42(g)

*continued on page 3*

# A Tale of Two States: Regulations Related to Direct Potable Reuse (cont.)

managed by the DDW in California. In fact the full advanced treatment and pilot testing utilized in Big Spring is the same as the requirements California that are administered by the DDW[6].

An industrial discharge permit was required by the TCEQ for the CRMWD to be able to discharge the approximately 25% reject water from the RO process into Beals Creek by the TCEQ. The Creek is naturally high in dissolved solids (up to 4000ppm) and the reject water was determined to be a low impact to the creek. John Grant also noted that the CRMWD operates a diversion dam which diverts the high TDS flow out of the downstream reservoirs. The reduced flow from eliminating the wastewater effluent discharge to Beals Creek resulted in a reduced salt loading into the downstream surface water reservoirs which resulted in a key benefit for the CRMWD.

The backwash from the project would be routed back to the wastewater treatment plant and CRMWD was required to obtain an industrial pretreatment permit from the City of Big Springs. A similar permit system is in place in California as both states fall under the Code of Federal Regulations[7] for Significant Industrial Users. When citing the raw water facility, the Texas Administrative Code required at least 500 feet between the two facilities[8].

The TCEQ made it clear that for any future DPR projects to be constructed the agency would require the plans and specifications to be submitted to the agency. The agency would then review each project on a case by case basis to determine if it would be feasible to proceed. The TCEQ has some points that it wants utilities to consider as they move forward with DPR projects which include: evaluation of all potential water sources before the embarking on DPR projects, considering the financial expense for reuse projects, experienced staff who are able to operate DPR projects, a commitment to monitoring, and the full understanding that pilot studies will be required along with a full-verification test[9].

The Texas Water Development Board which supplied grant funding for the project requested that CRMWD participate in a series of scientific and engineering studies to provide the historical operational evidence of the efficacy of the project. The Integrated Treatment Train Toolbox for Potable Reuse should be released to the TWDB within the next few months on their website[9]. The report may provide the evidence California needs to demonstrate that blended water is safe and feasible thus achieving the state's recycling goals[10].

The Big Springs Raw Water Treatment Plant has proven that the ability to produce high quality water is possible even with unknown regulatory acceptance. California shares very similar regulatory mechanisms for handling blended water produced from wastewater treatment plants but it is still unclear how California will interpret blended water without environmental barriers moving forward. Additional cities in Texas are looking at the Big Spring project as a way to provide a new source of water to their community. Texas Representative Drew Darby who was a former San Angelo, Texas Board Member sums up the regulatory difference of an overarching state policy versus a city by city policy in relation to DPR regulations: "I don't think the (Texas) Legislature needs to do anything else in regards to legislation. The technology is in place. TCEQ has studied the issue. Now it's the (San Angelo) City Council's decision whether to pursue this option or not."[11]

6 California Code of Regulations, Health and Safety Code, Ch. 16, title 22, Section 64552 & 64560; Ch 17, Title 22 Section 64653
7 40 CFR, Chapter I, Subpart N, parts 405-471
8 30 TAC § 309.13
9 http://www.twdb.texas.gov/innovativewater/reuse/projects/CRMWD%20RWPF/index.asp
10 California Water Code § 13560 (c)
11 By Rashda Khan, Rashda.Khan@gosanangelo.com / @Rashda_SAST. (2016, April 23). Legislation governing water reuse in Texas. Retrieved October 27, 2016, from http://bit.ly/2fbcQfQ

Figure below provided by David W. Sloan, P.E., BCEE of Freese and Nichols Engineering for use in this story.

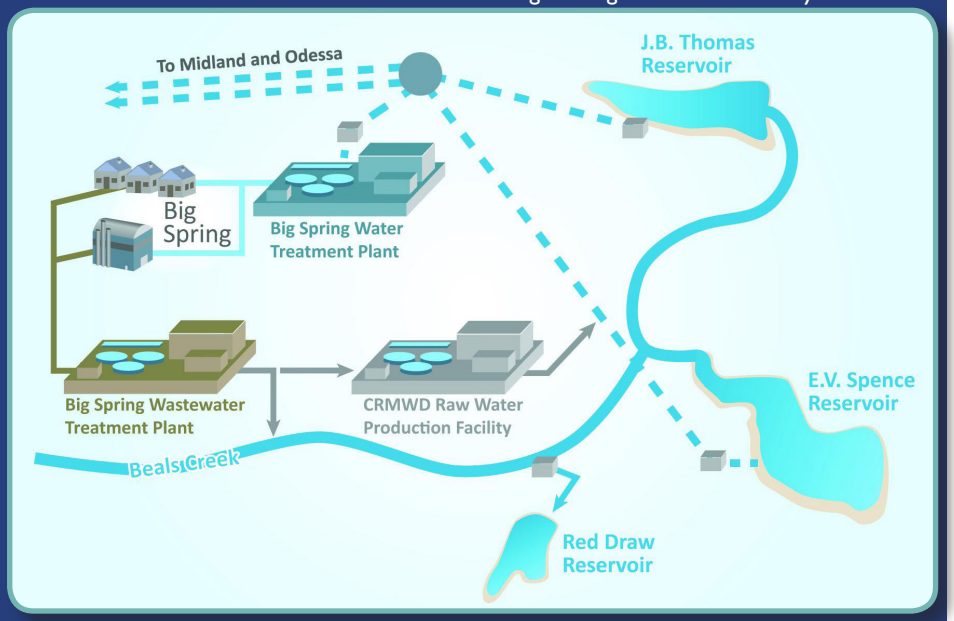


**Figure 1: Water Flow Diagram from Big Springs Wastewater Plant to Big Springs Water Treatment Plant through CRMWD Raw Water Facility**

# Bacterial Test Method Updates for Title 22 Compliance

*by Patsy Root; Regulatory Affairs Manager, IDEXX Water at IDEXX Laboratories, Inc.*

Laboratories may be excited to hear that the State Water Resources Control Board now allows US EPA-approved drinking water methods when testing for Total Coliforms in recycled water samples.

California Title 22 requires the enumeration of Total Coliforms (TC), with allowable TC levels determined by the end use of the recycled water. The testing of TCs must be performed by a laboratory accredited by the California Environmental Laboratory Program (CA ELAP). In order to be eligible to test these recycled water samples, the laboratory must have a TC enumeration method included in their Scope of Accreditation. Currently, the most prominently used method is Multiple Tube Fermentation (MTF), which is included by CA ELAP in their Field of Testing 107 (FOT 107) list of wastewater methods.

Historically, Title 22 methods were chosen from a table of methods listed in the US EPA Wastewater Rule. (This Wastewater Rule is codified in the Code of Federal Regulations at 40 CFR 136.) While the decision to use EPA wastewater methods for detecting TC in recycled water was a logical choice when Title 22 was originally written, the treatment processes in use today produce water that is of far better quality than could have been imagined at that time. Therefore, the use of only wastewater methods may not continue to meet the expanding vision for recycled water in California because today's recycled water no longer resembles wastewater.

In response to this shifting landscape, in May of 2016 CA ELAP (under the direction of California's Division of Drinking Water's Recycled Water Unit) announced that total coliform testing of recycled water could be performed using several of the drinking water methods found in the EPA Drinking Water Regulations at 40 CFR 141. These new allowable methods are listed by CA ELAP in their FOT 101 method list (see chart below).

The primary rationale for adding drinking water test methods for Title 22 compliance is that recycled water produced today is of much higher quality than wastewater. However, there are additional benefits to using drinking water test methods that labs should consider. For example:

1. Public perception: Being able to tell the public that drinking water methods are used to test water quality could help boost public confidence in the use of recycled water.
2. Paving the way for Direct Potable Reuse (DPR). California is considering DPR as a future use of recycled water. Several TC methods listed in FOT 101 allow the simultaneous detection of TC and E. coli. Under the EPA drinking water regulation, E. coli is the public notification target. Being able to monitor a disinfection system for both TC and E. coli removal is advantageous if Direct Potable Reuse is an eventual goal for the system.
3. Lab efficiency. Some methods from FOT 101 allow a laboratory to use one test to meet multiple regulatory test requirements. For example, select SM 9223B methods could be used to test recycled water, drinking water, source water, ground water, wastewater and others matrices.
4. Ease of use. Some of the FOT 101 methods are easier to perform and provide easier-to-interpret results than multiple tube fermentation.

If a laboratory currently has an FOT 101 method on their Scope of Accreditation, they are able to use that method for compliance TC testing under Title 22. If a laboratory does not have an FOT 101 listed in their scope, these methods can be added by following the CA ELAP requirements listed at their website: http://www.waterboards.ca.gov/drinking_water/certlic/labs/index.shtml# under "Application".

Recycled water should be viewed and treated as a resource, not as waste.

Please contact the author for additional guidance on adopting SM9223B methods for recycled water: Patsy-Root@idexx.com

***"Recycled Water Should Be Viewed As A Resource, Not As Waste."***

**Acceptable Total Coliform methods for disinfected secondary and tertiary recycled waters**

| 40 CFR 141 (Found on FOT 101) | 40 CFR 136 (Found on FOT 107) |
|---|---|
| SM 9221 B,C | SM 9221 B |
| SM 9222 B | SM 9222 B |
| SM 9223 B Colilert | |
| SM 9223 B Colilert-18 | |
| SM 9223 B Colisure | |
| m-ColiBlue 24 | |
| EPA 1604 | |

**Approved 5/20/16**
Source: http://www.waterboards.ca.gov/drinking_water/certlic/labs/documents/announcement_recycled_water.pdf

# Direct Potable Reuse - Status Update

*by Debbie Burris, PE | DDB Engineering*

The State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW) released the Public Draft Report on the Investigation on the ***Feasibility of Developing Uniform Water Recycling Criteria for Direct Potable Reuse (DPR)*** on September 8, 2016. During the 45-day review period, DDW held several briefings and two public workshops. The Public Review period ended on October 25, 2016. The SWRCB received 37 letters commenting on the Draft Report from the general public and a variety of entities. (For the Draft Report, see http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/documents/rw_dpr_criteria/draft_report_to_legislature_dpr_public_review.pdf. For the public comments, see http://www.waterboards.ca.gov/public_notices/comments/drinkwater_potable_reuse/)

## STATUTORY REQUIREMENTS

The California Legislature enacted Senate Bill 918 in 2010 and Senate Bill 322 in 2013 that require DDW to complete the following tasks:

| Task | Deadline | Status |
|---|---|---|
| Adopt Groundwater Recharge Regulations | 12/31/2013 | ✓ |
| Adopt Surface Water Augmentation Regulations | 12/31/2016 | On track |
| Prepare Draft Report on Expert Panel Recommendations and Research Status | 6/30/2016 | ✓ |
| Release Public Review Draft Report on Feasibility of Developing Direct Potable Reuse Criteria | 9/1/2016 | ✓ |
| Submit Final Report to the Legislature | 12/31/2016 | On track |

## PUBLIC REVIEW DRAFT REPORT ON FEASIBILITY OF DEVELOPING DPR CRITERIA

The main difference between DPR and indirect potable reuse (IPR) is that DPR lacks a meaningful environmental buffer. Three types of DPR are shown on Figure 1.

The Investigation on the Feasibility of Developing Uniform Water Recycling Criteria for DPR includes:

- Recommendations of the Expert Panel that advised SWRCB DDW on public health issues and scientific and technical matters regarding:
  - Development of uniform water recycling criteria for indirect potable reuse through surface water augmentation
  - Investigation of the feasibility of developing uniform water recycling criteria for DPR
  - Assessment of needs for additional research with recommendations for an approach for completion
- Recommendations of the Advisory Group that advised the Expert Panel regarding investigation of the feasibility of developing uniform water recycling criteria for DPR and advised DDW on other relevant topics (e.g., practical considerations for regulations that are protective of public health and achievable by project proponents)
- Regulations and guidelines on DPR from jurisdictions in other states, federal government, and other countries
- Research by the SWRCB regarding unregulated pollutants (Recycled Water Policy)
- Water quality and health risk assessments associated with existing public water supplies subject to discharge from municipal wastewater, storm water, and agricultural runoff
- Results of the SWRCB's investigations (pursuant to California Water Code § 13653) on:
  - Reliability of treatment to protect public health
  - Multiple barriers that may be appropriate
  - Health effects
  - Mechanisms to protect public health if problems occur
  - Monitoring needed to ensure protection of public health
  - Any other scientific or technical issues, including the need for additional research

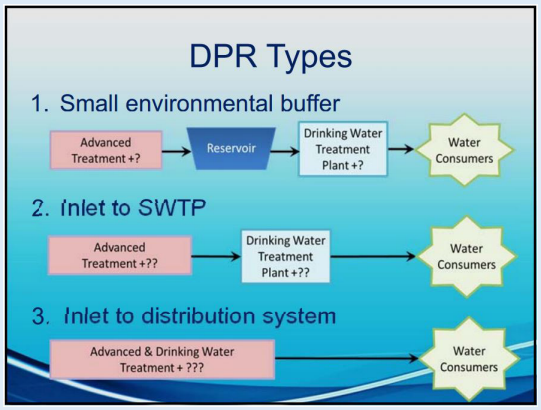


Figure 1. Types of DPR
(Source: SWRCB Public Workshop on 10/6/2016)

The SWRCB investigation acknowledges that "the use of recycled water for DPR has great potential but it presents very real scientific and technical challenges that must be addressed to ensure the public's health is reliably protected at all times."

The Public Review Draft "presents an assessment of the issues associated with DPR as directed by the Legislature, carefully considers the findings and recommendations of the Expert Panel and Advisory Group, and presents a number of conclusions and recommendations…and an implementation plan for development of criteria for DPR."

WateReuse California submitted comments to the SWRCB on the Public Review Draft and recommended that research topics be divided into near-and long-term goals to create a clear path to create DPR regulations. Near-term research projects could be completed to provide the SWRCB with information needed to develop criteria that are protective of public health.

The revised "Report to the Legislature on the Feasibility of Developing Uniform Water Recycling Criteria for Direct Potable Reuse" (DPR Report) is expected to be presented to the SWRCB for approval at the Board's Dec. 6 meeting. The staff presentation will focus on their response to comments.

## PUBLIC AGENCIES

El Toro Water District
Irvine Ranch Water District
Mesa Water District
Metropolitan Water District of Southern California
Moulton Niguel Water District
Orange County Water District
Santa Margarita Water District
South Coast Water District
South Orange County Wastewater Authority
State Water Resources Control Board - Division of Drinking Water

## ASSOCIATES

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John Robinson Consulting, Inc.
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MWH
PACE
Pacific States Environmental
Psomas
RMC Water and Environment
SPI
Stantec Consulting
Tetra Tech

# The Metropolitan Water District of Southern California's Regional Recycled Water Program (continued from page 1)

supply that is suitable for indirect potable reuse through groundwater replenishment. These technologies include reverse osmosis membrane treatment followed by ultraviolet light and other processes. The water would be purified, injected or spread onto groundwater basins as another "barrier" of safety, pumped out and re-treated as necessary before entering the drinking water system.

### Groundwater Basins: Dependent on Metropolitan

Groundwater basins produce about a third of Southern California's overall water needs thanks in part to replenishment supplies from Metropolitan. Along with Metropolitan's imported supplies, this purified water would represent a new, drought-proof supply for groundwater replenishment.

Sanitation Districts' Joint Water Pollution Control Plant in Carson

## KEY MILESTONES

**November 2015**

- Metropolitan and Sanitation District's boards approved agreement for demonstration project and feasibility studies.
- Metropolitan board authorized $15 million for demonstration-scale recycled water treatment plant and studies.

**2016-2017**

- Design and construct demonstration-scale plant.
- Both boards review feasibility studies and consider recommended next steps.

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## GOT NEWS?

We're always looking for interesting stories and informational articles to keep our members up to speed on all that's happening in water reuse and reclamation. If you would like to contribute an article or have other ideas about this newsletter, please email Debbie Burris (dburris@ddbe.com) or Lisa Knox (lknox@dudek.com)

**WateReuse Association** www.watereuse.org/sections/california/orange-county

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