



*WATER REPLENISHMENT DISTRICT
OF SOUTHERN CALIFORNIA*

APPROACH TO CALCULATING RECYCLED WATER CONTRIBUTION

SECURING OUR WATER FUTURE TODAY

WRD SERVICE AREA



**Service Area =
420 Square Miles**



43 Cities



**Population
> 4 Million**



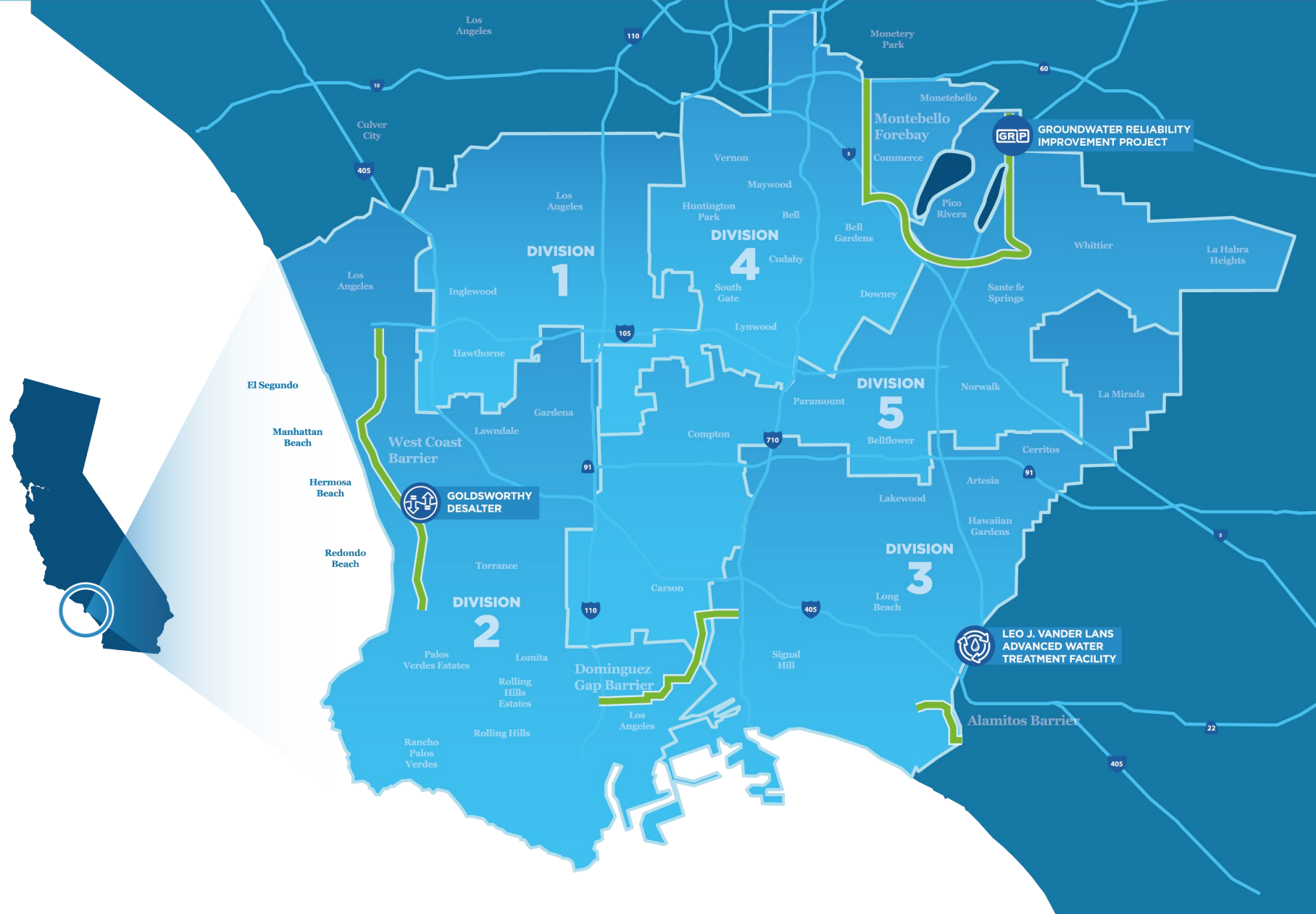
**550,000 acre feet
used per year**



**50% Groundwater
from local water wells**



**WRD supplements
natural groundwater
recharge**



WATER INDEPENDENCE NOW PROGRAM (WIN)



Collection of projects to eliminate remaining demand for imported water.

A key to developing independence from imported water is the development of local recycled water sources.

Increased Recycled Water Usage



GROUNDWATER RELIABILITY IMPROVEMENT PROJECT

- Advanced Water Treatment Facility
- New Turnout Structure at Spreading Grounds

Increased Stormwater Capture

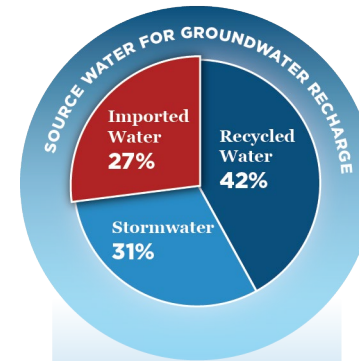


Whittier Narrows Conservation Pool Improvements

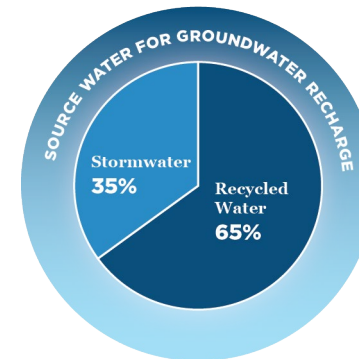


New Rubber Dams in San Gabriel River

BEFORE WIN



AFTER WIN



Increased Advanced Treated Water Production



Alamitos Seawater Barrier

- From WRD's Leo J. Vander Lans Advanced Water Treatment Facility

Increased Advanced Treated Water Purchases



Dominguez Gap Seawater Barrier

- From City Los Angeles Terminal Island Treatment Plant



West Coast Seawater

- From West Basin Municipal Water District Edward C. Little Water Recycling Facility

Montebello Forebay Spreading Grounds



San Gabriel Coastal Spreading Grounds

Rio Hondo Coastal Spreading Grounds



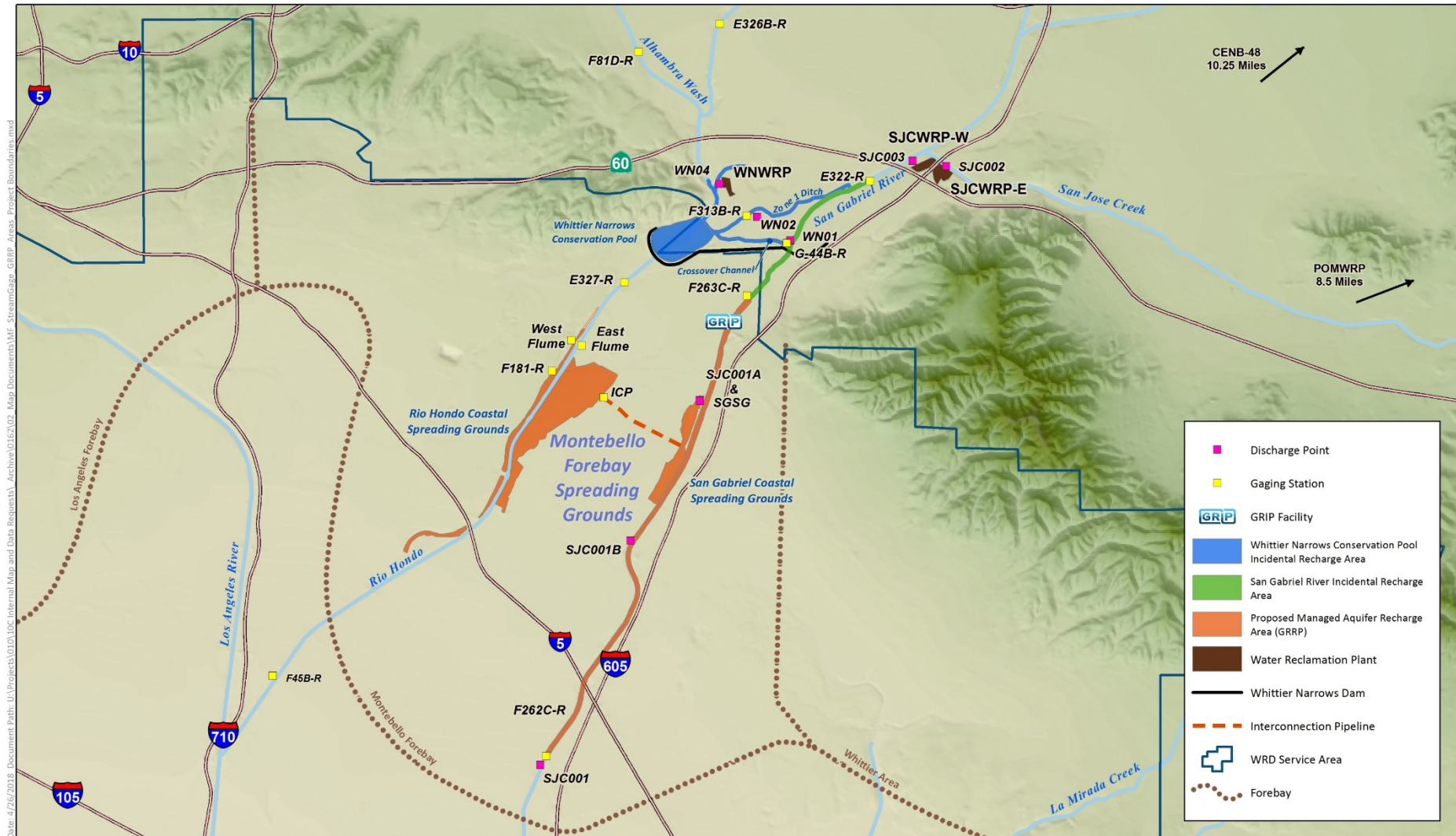


TYPES OF SOURCE WATER FOR RECHARGE

- Recycled water
 - Tertiary treated recycled water (surface application, requires Soil Aquifer Treatment (SAT))
 - Advanced treated recycled water (surface and subsurface application)*
- Diluent water
 - Local Water (high TDS, high TOC, high anthropogenic constituents, etc.)
 - Stormwater Runoff
 - Urban Runoff
 - Precipitation (low TDS, low TOC, minimal anthropogenic constituents, etc.)
 - Rainfall
 - Imported water (high TDS, scarce commodity, high cost, etc.)
 - State Water Project
 - Colorado River Aqueduct (currently not used due to Quagga Mussel issues)
 - Underflow (from one GW basin to another)

* Calculated as Null water

Montebello Forebay Spreading Grounds





PERCENT RECYCLED WATER CONTRIBUTION (%RWC) – W/O ARC ADVANCED TREATED RECYCLED WATER (PRIOR TO 2019)

- *Recycled Water Contribution (RWC)* = $\frac{\text{Recycled water}}{\text{Total water}}$
 - Total water = Recycled water + Diluent water
 - Recycled water = Tertiary treated water from SJCWRP + POMWRP + WNWRP
 - Diluent water = Imported water + Local water + Precipitation + Underflow
 - Imported water = state water project (CENB-48)
 - Local water = Stormwater and urban runoff conserved by LA County Department of Public Works¹ (LACDPW)
 - Precipitation = rainfall directly infiltrated in/around Montebello Forebay Spreading Grounds (MFSG)
 - Underflow = subsurface waterflow from San Gabriel Basin to the Central Basin

¹ - LACDPW owns and operates the Montebello Forebay Spreading Grounds.

ARC ADVANCED TREATED WATER AS NULL WATER

- ARC Advanced Treated Recycled Water (ATW) is classified as null water
 - RWQCB has determined that ATW can be referred to by this new term, and
 - Excluded from the RWC calculation as either the recycled water or the diluent water
- Reduces the recycled water contribution in the RWC calculation

%RWC EXAMPLE W/ ARC ADVANCED TREATED RECYCLED WATER AS NULL WATER

- *Recycled Water Contribution (RWC)* =
$$\frac{\text{Tertiary Recycled water}}{\text{Tertiary Recycled water} + \text{Diluent water}}$$
 - Recycled water =
Tertiary treated recycled water from SJCWRP + POMWRP + WNWWRP
 - Diluent water =
Imported water + Stormwater + Urban runoff + Precipitation + Underflow
- Introduction of ATW as Null Water changes the RWC results
 - Prior to the operation of the ARC AWTF, all recycled water from the three WRPs was received as tertiary water for replenishment
 - Following start-up of the ARC AWTF, a portion of the tertiary water from SJCWRP is diverted and treated at the ARC AWTF prior to blending with the tertiary water for recharge, thus reducing the total amount of tertiary recycled water used for calculation.
- Reducing the volume of recycled water because of the ARC Null Water status results in a lower Recycled Water Contribution



ADVANCED TREATED RECYCLED WATER AS DILUENT WATER

- WRD is pursuing to classify ARC ATW as diluent water.
- Some facts about ATW:
 - Lower TDS than local water or imported water,
 - Lower TOC than local water,
 - Minimal anthropogenic constituents, if any,
 - Lower cost than imported water (in the future),
 - No Quagga Mussel issues
- Compliance with §60320.114. Diluent Water Requirements.
 - Primary MCLs, Secondary MCLs, and Notification levels
 - Source water evaluation
 - Or any other requirements pursued by DDW

%RWC EXAMPLE W/ ARC ADVANCED TREATED RECYCLED WATER AS DILUENT WATER

- *Recycled Water Contribution(RWC)* =
$$\frac{\text{Tertiary Recycled water}}{\text{Tertiary Recycled water} + \text{Diluent water}}$$
 - Recycled water =
Tertiary treated recycled water from SJCWRP + POMWRP + WNWRP
 - Diluent water =
Imported water + Stormwater + Urban runoff + Precipitation + Underflow +
ARC ATW
- Not only does the volume of Tertiary Recycled Water get reduced, the volume of Diluent Water gets increased; therefore, introducing ARC ATW as diluent water will further reduce the RWC.



%RWC UNDER THREE SCENARIOS

	Without ARC advanced treated water	With ARC advanced treated water as Null Water	With ARC advanced treated water as Diluent Water
Recycled Water	50,000 AF	40,000 AF	40,000 AF
Diluent Water	75,000 AF	75,000 AF	85,000 AF
Null Water	0 AF	10,000 AF	0 AF
Total Water	125,000 AF	115,000 AF	125,000 AF
%RWC	40	35	32

$$\text{Recycled Water Contribution (RWC)} = \frac{\text{Recycled water}}{\text{Recycled water} + \text{Diluent water}}$$

ADVANTAGES OF CLASSIFYING ARC ATW AS DILUENT WATER

- The permit only allows 45% of the recharge water to be recycled water.
 - When RWC hits 40%, alternative monitoring program for TOC and increase in monitoring frequencies have to be initiated.
- The RWC was very closed to 40% before the recent storm.
 - With the relief of the stormwater, the latest RWC is at 38.4%.
- Maximize the recharge volume of recycled water.



THANK YOU

