

# INCREASING WATER SUPPLY BY CAPTURING STORMWATER IN SOUTHERN LOS ANGELES COUNTY

Asha Kreiling, Water Resources Analyst; akreiling@wrd.org Brian Partington, Manager of Hydrogeology; bpartington@wrd.org

This Technical Bulletin (TB) summarizes the natural geological constraints on infiltrating stormwater to usable drinking water aquifers in an already highly impervious portion of Southern Los Angeles County. Recommendations are also provided for project proponents in this region seeking to achieve water supply benefits through stormwater infiltration under the Los Angeles County Safe Clean Water Program (SCWP).

## Replenishing the Central and West Coast Basins

In 1959, Water Replenishment District (WRD) was formed to protect and replenish groundwater resources in two adjudicated basins; Central Basin and West Coast Basin (basins or CBWCB). The basins are actively replenished through managed aquifer recharge using injection wells along the coast (i.e., seawater intrusion barrier) and recharge basins located in the Montebello Forebay Spreading Grounds (MFSG). Both facilities are owned and operated by the Los Angeles County Department of Public Works. The basin hydrogeology is described further in TB-01 (WRD, 2004) and a generalized cross-section is shown below in **Figure 1**.

Since the late 1930s, the MFSG have successfully captured billions of gallons of stormwater to replenish the drinking water aquifers of the CBWCB. Experts in geology and engineering recognized the potential for stormwater capture to recharge this portion of the basin based on the abundance of coarse-grained sediments with little to no fine-grained sediments to prevent the vertical movement of water into the deeper, useable drinking water aquifers – local examples include the Lynwood and Silverado Aquifers. This portion of the basin is referred to as “unconfined” and is defined locally as a “forebay” in the CBWCB. Other areas of the basin that are less suitable for surface recharge include areas where sediments are predominately fine-grained (i.e., abundance of silts and clays) and are generally referred to as “confined” and is defined locally as a “pressure area.” Stormwater capture projects seeking to infiltrate beyond shallow soil layers to

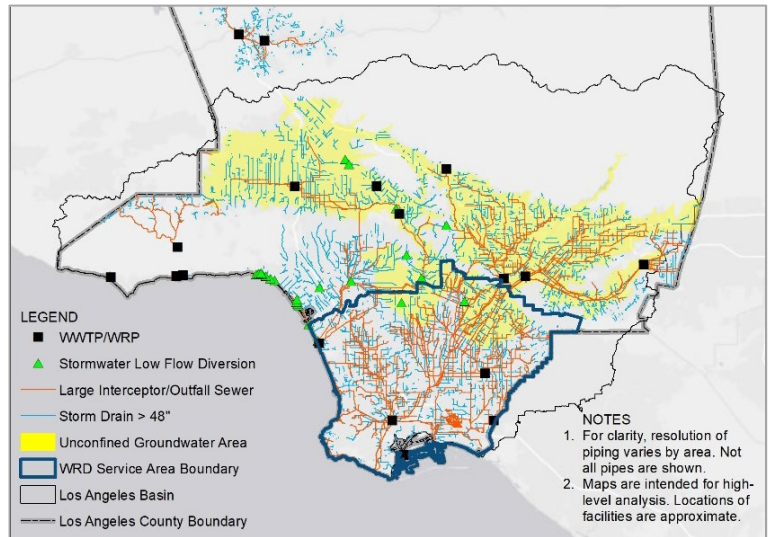


Figure 2. Unconfined groundwater areas in the Los Angeles basin (CH2M, 2018; modified to include WRD service area boundary).

recharge usable drinking water aquifers should prioritize areas with unconfined aquifers that are similar to the sediments located in the MFSG. Additional details are available in TB-14 (WRD, 2008).

A 2012 study found that approximately 10% of the 270,000 acres (or 27,000 acres) within WRD’s service area are suitable for local and regional stormwater recharge (CWH, et. al., 2012). A 2018 white paper also estimated that unconfined aquifers are present below only 28% of the Los Angeles Basin (CH2M, 2018). The unconfined areas in this white paper are highlighted yellow in **Figure 2**.

In addition, pumping and utilizing perched groundwater is unrealistic and “unless locally reused, stormwater infiltration above confined aquifers does not contribute to the water supply, as noted by CH2M (2018).

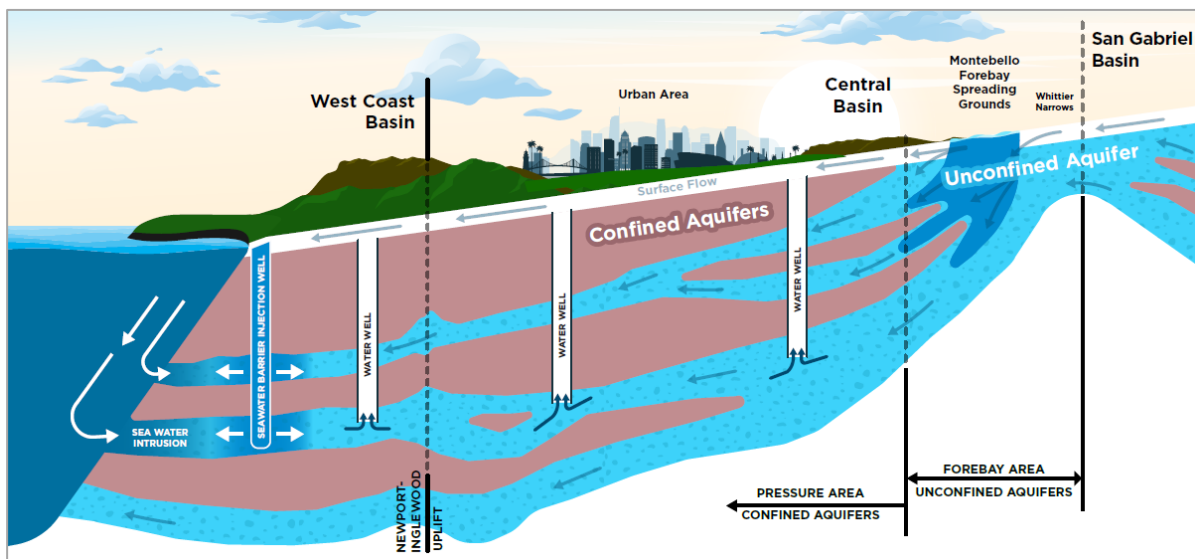


Figure 1. Simplified diagram of the unconfined and confined aquifers in the Central and West Coast Basins

## Recommendations for SCWP Stormwater Projects

Regulatory requirements and funding opportunities (i.e., SCWP) have spurred multi-benefit stormwater capture projects to promote water supply, water quality, and other community benefits in the Los Angeles County Region. Proposed projects that desire to provide water supply benefits by capturing stormwater or urban runoff must (a) reuse onsite, (b) divert to sewer for recycling, or (c) infiltrate to groundwater (Los Angeles County, 2022).

Project scoring considers the findings of a required Feasibility Study, which must include an engineering analysis demonstrating (1) infiltrated water is reaching a managed, usable groundwater aquifer and (2) concurrence with the agency responsible for managing the groundwater basin (in this case WRD). WRD's service area includes Lower San Gabriel River, Lower Los Angeles River, and South Santa Monica Bay watersheds (**Figure 3**). WRD offers recommendations for promoting water supply and water quality benefits as follows:

### a) Reuse Onsite

- Consider higher costs to install, operate, and maintain onsite reuse structures (e.g., engineered detention vaults) relative to the use of existing water resources ranging from local groundwater currently at \$454 per acre-foot (AF) to treated imported supplies at approximately \$1,500 per AF (WRD, 2025).
- Detention structures could have a higher likelihood of success reaching deeper drinking water aquifers in areas where unconfined aquifers exist like the MFSG.

### b) Diversion to Wastewater Treatment Plant

- Leverage existing wastewater infrastructure to divert and treat stormwater — especially dry-weather flows and initial urban runoff, which generally contain the highest concentrations of pollutants — to create additional recycled water supplies.
- Coordinate with local wastewater management agencies: Sanitation Districts of Los Angeles County, City of Los Angeles Bureau of Sanitation, and/or Consolidated Sewer Maintenance District of Los Angeles County.

### c) Infiltration to Groundwater

- Prioritize areas of unconfined aquifers (aka Forebays).
- Conduct geotechnical studies to evaluate likelihood recharge will reach usable drinking water aquifers - not just shallow perched water or other unusable water.
- Dry well standards are being developed and may have some future limitations – see California Well Standards.
- Injection wells; consider higher costs to install, operate and maintain, and comply with regulations for advanced treatment and discharge requirements (i.e., Title 22).



**Figure 3.** Three Los Angeles County SCWP watershed areas overlie WRD's service area, including the Lower San Gabriel River, Lower Los Angeles River, and South Santa Monica Bay watershed areas

- Contact WRD (Watermaster Administrative Body for Central and West Coast Basins) regarding potential injection or spreading activities and processes pursuant to the Judgments.
- If perched conditions exist, evaluate the increased potential for liquefaction and contaminant migration.

WRD, as a groundwater management agency, supports stormwater capture and encourages practitioners to build upon existing data and research referenced in this TB. Suitable subsurface hydrogeological conditions should be considered along with an emphasis of protecting local drinking water aquifers, which store vital water resources throughout California.

WRD staff are available to assist project proponents in reviewing plans to recharge deep, drinking water aquifers in the CBWCB. Any requested review should include supporting information generally to include a summary of local geologic conditions, depth to drinking water aquifers, boring logs and infiltration data from a geotechnical study, etc.

#### References:

- CH2M HILL Engineers, Inc (CH2M, 2018).**, *Tapping into Available Capacity in Existing Infrastructure to Create Water Supply and Water Quality Solutions*, May 2018.
- Council for Watershed Health, Geosyntec Consultants, and the Santa Monica Bay Restoration Commission (CWH et. al., 2012)**, *Stormwater Recharge Feasibility and Pilot Project Development Study*, August 2012.
- Los Angeles County**, *SCW Program 2022 Interim Guidance*, May 2022.
- U.S. Geological Survey**, *Geohydrology, Geochemistry, and Ground-Water Simulation-Optimization of the Central and West Coast Basins*, 2003.
- WRD, 2004**, *An Introduction to the Hydrogeology of the Central and West Coast Basins. Technical Bulletin No. 1*, Fall 2004.
- WRD, 2008**, *Groundwater Replenishment in the Montebello Forebay Spreading Grounds. Technical Bulletin No. 14*, Winter 2008.
- WRD, 2025**, *Cost of Service Report*, April 2025.