PERC FEASIBILITY STUDY SYNOPSIS

Program for Expansion of Recharge Capacity (PERC) Comprehensive Feasibility Study

The Program for Expansion of Recharge Capacity (PERC) Comprehensive Feasibility Study was undertaken by the San Bernardino Valley Water Conservation District (SBVWCD or Conservation District) and its partners to evaluate opportunities for expanding groundwater recharge within the Upper Santa Ana River Watershed. The Feasibility Study is presented in four volumes and documents the findings of several technical studies, describes the analysis methodology, and reports prioritization outcomes for ten PERC project alternatives across six recharge sites within the East Twin Creek, Plunge Creek, and Mill Creek watersheds.

The objective of the Feasibility Study is not to eliminate alternatives, but to prioritize implementation of projects that most effectively enhance regional water supply reliability and resiliency over a 50-year planning horizon (2026-2075).

The PERC initiative is a result of the Partnership Agreement for Joint Active Recharge Project Development established in 2018 with San Bernardino Valley Municipal Water District

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(SBVMWD) to increase groundwater recharge. It was enhanced by a 2021 Memorandum of Understanding between the Conservation District and San Bernardino County Flood Control District (SBCFCD) to explore joint use of flood control facilities for groundwater recharge without compromising flood protection functions.

Ten final project alternatives were advanced for analysis, representing a mix of new basin construction, grading modifications, and operational improvements across six locations:

1. Lynwood Recharge Basins
2. Mill Creek Recharge Basins
3. Oak Creek Recharge Basins
4. Plunge Creek Recharge Basins
5. Twin Creek Recharge Basins
6. Waterman Recharge Basins

Two originally proposed sites–Cook Creek and Bledsoe Creek–were removed due to environmental and hydraulic constraints.

TECHNICAL STUDIES

Comprehensive hydrologic and geotechnical investigations supported the feasibility analyses:

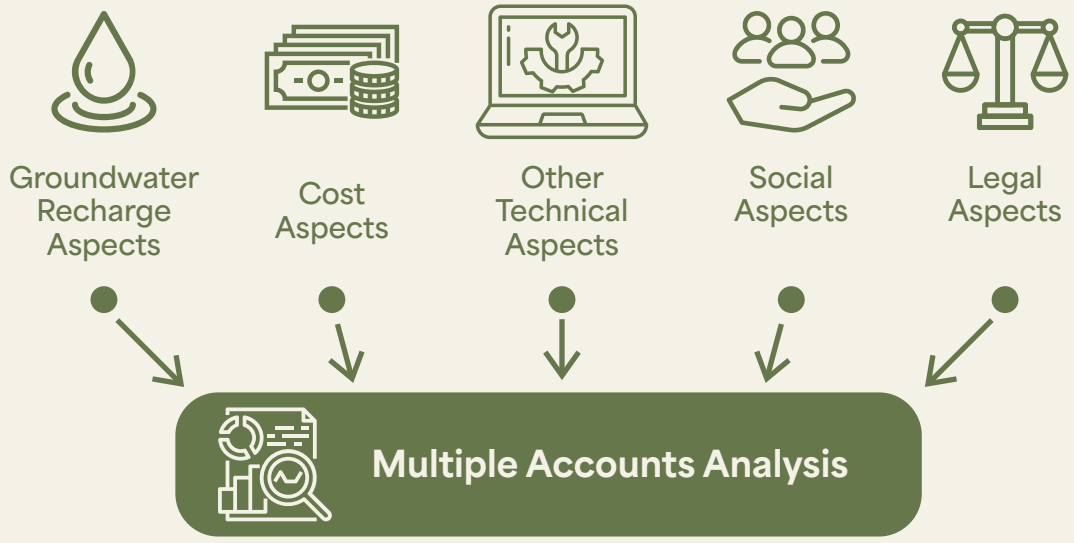
- Local Site Hydrology examined unregulated tributary runoff to determine typical storm hydrographs (Project Typical Hydrographs) that reflect realistic capture opportunities.
- FIRO (Forecast Informed Reservoir Operations) hydrology analyses, based on a preliminary FIRO viability assessment, modeled regulated flow releases from Seven Oaks Dam and identified potential conjunctive use scenarios for several PERC sites.

Additional technical studies evaluated infiltration rates, groundwater quality improvements, and environmental compatibility. These analyses underpin the recharge potential, cost, and permitting feasibility of each alternative.

PROJECT EVALUATION METHODOLOGY

Project ranking employed a Multiple-Accounts Analysis (MAA), which is a structured, transparent, decision-support method. Five major factors, known as Accounts, guided the evaluation, each weighted based on stakeholder consensus:

1. **Groundwater Recharge Aspects** consider the recharge yield, infiltration rate, and long-term firm yield over the 50-year planning horizon for each alternative.
2. **Cost Aspects** reflect the capital and operational costs for each alternative with funding availability considerations.
3. **Other Technical Aspects** include the groundwater quality benefits, habitat conservation, and system connectivity of each alternative.
4. **Social Aspects** consider job creation and safety aspects of the alternatives.
5. **Legal Aspects** consider the permitting complexity, CEQA requirements, land ownership, and water rights as they pertain to each alternative.



Each Account was scored using quantitative indicators (e.g., acre-feet per year [AFY] recharged, project cost in net present value [NPV], CEQA filing type). Individual indicator scores were combined to produce total weighted rankings across all ten project alternatives.

PROJECT FINDINGS

All ten alternatives demonstrate the ability to improve groundwater recharge; their distinctions lie primarily in scale, implementation timeframe, and permitting complexity:

East Twin Creek Watershed

- **Lynwood Operational Alternative:** Low-cost automation and re-operation project offering near-term implementation with moderate recharge benefits.
- **Twin Creek Small Grading Alternative:** Low-cost, near-term enhancement.
- **Twin Creek Large Grading Alternative:** Substantial recharge potential but high capital cost and extended timeline.
- **Waterman Grading Alternative:** Major grading and channel modifications; high recharge yield but higher cost.

Plunge Creek Watershed

- **Oak Creek Construction Alternative:** New basins upstream of existing conservation facilities, combining hydrologic and habitat benefits.
- **Plunge Creek Interim Construction Alternative:** Three-basin configuration providing early recharge gains.
- **Plunge Creek Ultimate Construction Alternative:** Long-term, large-scale expansion envisioned after mining completion.

Mill Creek Watershed

- **Mill Creek Grading Alternatives 1-3:** Progressive basin expansion and reconfiguration options offering the highest recharge yields, though at high cost and moderate complexity.

RESULTS AND RANKING

The highest ranked alternative scores are primarily driven by their sustainable recharge rate, their annual recharge, and their firm yield from the longer-term probability of native water availability for each.

- On an objective basis using the weighting matrix, the highest priority project is the **Oak Creek Construction Alternative**.
- The **Plunge Creek** projects are the next highest priority projects, the Interim Construction Alternative followed by the Ultimate Construction Alternative. The high priority for the sequential Plunge Creek projects would promote an even slightly higher priority for each given the lowered overall costs due to their co-located and retainable diversion structure, but they are still independent projects and can be considered independently.
- **Mill Creek's largest project** (Alternative 3) has effectively the third highest priority of projects that can be initiated now.

The table below presents the final MAA scoring and priority ranking results.

PERC PROJECT ALTERNATIVE	CAPITAL COST[1]	GROUNDWATER RECHARGE[2]	MAA TOTAL SCORE	TECHNICAL RANKING
Oak Creek Construction	$18.4M	54,242	4.55	1
Plunge Creek Interim Construction	$16.4M	40,874	4.37	2
Mill Creek Grading Alternative 3	$84M	155,664	4.29	3
Plunge Creek Ultimate Construction	$8.2M	49,351	4.19	4
Mill Creek Grading Alternative 2	$78.2M	128,105	4.14	5
Lynwood Operational	$2.3M	33,847	4.12	6
Mill Creek Grading Alternative 1	$73.8M	93,286	3.95	7
Waterman Grading	$21.9M	92,264	3.95	8
Twin Creek Small Grading	$10.8M	22,405	3.95	9
Twin Creek Large Grading	$57.8M	67,914	3.46	10

1. Net Present Value (USD) 2. Net increase in firm yield over 50-year horizon (af)

NEXT STEPS

The report recommends proceeding with phased implementation, beginning with projects offering the greatest near-term benefit and lowest administrative barriers, while maintaining momentum toward large-scale, FIRO-integrated alternatives. Future actions include:

- Utilizing technical rankings to support decision-maker prioritization of alternatives for detailed design and permitting.
- Continuing coordination among SBVWCD, SBVMWD, SBCFCD, and regional partners.
- Integrating outcomes of the Seven Oaks Dam FIRO Final Viability Assessment scenarios (2026-2028) into future recharge operations planning.
- Pursuing state and federal funding for capital-intensive projects.

CONCLUSION

The PERC Comprehensive Feasibility Study confirms the technical and institutional feasibility of significantly expanding groundwater recharge capacity in the Upper Santa Ana River Watershed. By aligning flood control, water conservation, and environmental stewardship objectives, PERC provides a robust roadmap for long-term water supply resiliency in the San Bernardino Valley region.

ACKNOWLEDGMENTS

The PERC Comprehensive Feasibility Study was made possible through the cooperation and technical contributions of multiple agencies, consultants, and interested parties dedicated to enhancing groundwater recharge and water supply resiliency within the Upper Santa Ana River Watershed. This report reflects the collective efforts of the following:

- Betsy Miller, Allison Zecher, Erwin Fogerson, Katelyn Scholte, John Lambie, Thomas Crowley, and Maria Pascoal on behalf of San Bernardino Valley Water Conservation District
- Heather Dyer, Wen Huang, Greg Herzog, Joanna Gibson, and Leo Ferrando on behalf of San Bernardino Valley Municipal Water District
- Ryan Shaw, Joshua Aguilar, and Mallory O'Conor on behalf of Western Water
- Farid Boushaki and Drew Faherty on behalf of Riverside Public Utilities
- Jesus Gastelum on behalf of Elsinore Valley Municipal Water District
- San Bernardino County Flood Control District
- City of Redlands
- East Valley Water District
- U.S. Army Corps of Engineers
- California Department of Water Resources
- CASC Engineering and Consulting (Prime Consultant, Volume 3)
- Q3 Consulting (Prime Consultant, Volume 4)
- Tetra Tech (Prime Consultant, Volume 2)

The Districts acknowledge their Boards of Directors and members of the PERC Joint Implementation Committee and PERC Policy Committee, whose ongoing collaboration and guidance have been essential to this study's development and prioritization process.

Special thanks are extended to the local, state, and federal agency partners, as well as community members and interested parties who participated in workshops, provided data, and contributed valuable insight throughout the planning process.

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