

## ● Report on the Innovative Supply Program Results

### Summary

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The following is a report on results of the Innovative Supply Program, which investigated innovative approaches toward expanding Southern California water supply benefits.

### Attachments

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[Attachment 1](#): Innovative Supply Program Projects

### Detailed Report

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#### Summary

Metropolitan's Innovative Supply Program identified two promising areas of supply growth for our region:

- Expanded use of small-scale water recycling projects
- Expanded capture of storm runoff for groundwater recharge

Developing successful projects for each of these approaches is highly dependent upon local conditions.

#### Background

The ISP was a pilot programmatic approach to review unsolicited water resource proposals that are periodically received by Metropolitan. Metropolitan awarded ten ISP grants totaling \$250,000 to assess new ideas for water supply. Participating studies are listed in Attachment 1. In addition to administering grant agreements for the studies, staff organized two task forces comprised of local experts to focus on opportunities for small-scale recycling and groundwater recharge to complement the formal program investigations. These two areas also offer potential application for compliance with Metropolitan's 2004 revised water efficiency guidelines for annexations, which call for use of both water recycling and groundwater resources.

#### Small-Scale Water Recycling

New technology and new applications of proven technology are providing viable opportunities to develop small-scale, decentralized water recycling facilities. Small-scale facilities capture wastewater generated nearby, treat it and deliver it for reuse applications without the need for large regional wastewater treatment plants, or major pumping plants. Because of their modest size, these facilities can be incrementally deployed within the scope of single housing projects or other developments such as golf courses, industrial parks or college campuses. The small project approach opens up recycling to established communities that are distant from major wastewater plants. Heavily developed urban settings can be retrofitted with limited disruption because of the modest rights-of-way requirements.

Small-scale projects implemented by public and private entities are materializing in various California locations and the trend is expected to continue. Staff believes that new small-scale water recycling projects that are pursued by our member agencies would be eligible for financial incentives under Metropolitan's competitive Local Resources Program and could help our region expand recycled water to locations that were previously not cost-effective. The approach may also be effective in improving local supply reliability for communities and businesses in our region. Additional benefits include: helping the environment through reduced wastewater discharge to downstream receiving water; and reducing wastewater disposal costs by avoiding or delaying expansion of existing trunk sewerlines and regional wastewater treatment plants.

Small-scale plants can employ either conventional tertiary treatment process or newer membrane bioreactor (MBR) treatment technology. Conventional tertiary plants require large sites because they use separate treatment processes for settling, aeration, and filtration. Small-scale MBR plants can accomplish treatment with

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reduced site requirements, since conventional secondary treatment is combined with low-pressure membrane filtration. These plants can be used in remote areas or located near a planned residential development to treat and reuse wastewater from the development. Smaller packaged plants can be located on a golf course to capture and treat wastewater from a nearby sewer trunk line for irrigation demand. Another innovative approach involves using the septic tanks for managing solids and having a small nearby treatment plant to treat the liquid for recycling.

The following are opportunities to implement small-scale package plants:

- Existing and new residential developments distant from major publicly owned treatment works
- Golf courses and park irrigation supply

### **Small-Scale Groundwater Recharge Facilities**

Southern California has been long recognized as a leader in capturing storm runoff to recharge groundwater basins, increase safe yield, and avoid losses to the ocean. Despite the existence of a comprehensive recharge system, substantial amounts of storm runoff continue to flow from paved developments to the ocean. Five ISP studies and the task force dialogue identified opportunities to expand groundwater recharge in new growth areas by focusing on smaller collection areas that have been overlooked in the past. Small-scale groundwater recharge facilities can be deployed in new or rehabilitated street and gutter catch basins. Benefits include increasing groundwater supply reliability, reduction or deferral of regional flood control facility improvements, and pollutant removal prior to discharge to receiving waterbodies. These facilities are site-specific and dependent on local hydrogeological conditions of underlying basins. Optimal storm runoff capture and measurable groundwater recharge are dependent on local factors such as depth to water table, existence of aquatards, frequency and amount of runoff, and water quality. Location-based investigations are needed to quantify actual safe yield increases and other benefits, and assess financial feasibility of small-scale installations.

Southern California opportunities for storm runoff projects include:

- Use of filtered well technology that modifies dry wells with cartridge filters to capture and treat runoff for shallow water discharge.
- Modifications of existing underground catch basins with filter systems to capture and filter runoff from road gutters for groundwater recharge.

### **Other Investigated Resource Opportunities**

The outcomes of the remaining ISP studies are listed below. These studies would benefit from further refining and development.

- Water bag technology was found to not be a cost-effective means of disposing industrial brine offshore. However, it may be used for providing water supplies during emergency disruption such as hurricanes, earthquakes, etc.
- Powdered form of an evaporation retardant that dissolves in water and floats on a reservoir surface was tested on two 15-foot above-ground pools. The results were about 30 percent reduction in evaporation. However, a future test for applicability to a larger reservoir surface subject to inflow/outflow, wind and other factors is recommended.
- Dewevaporation technology is a humidification and dehumidification process used for distillation. The ISP study evaluated use of liquid desiccant, which is water solution containing large quantities of dissolved salts, to enhance the energy recovery factor of a dew-evaporation process. The test unit encountered unpredictable problems and the study did not produce a definitive conclusion.

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- Reoperation of nine reservoirs in the Central Valley water system including Lake Shasta to capture water that would otherwise be released for flood control purposes and use it for groundwater banking was investigated. A computer model was developed to quantify the new yield potential. The results of the study are not yet published.

### **Future Investigation**

Judging from the experience gained in this trial competitive innovative supply grant program, staff recommends that future ideas with broad-based application be referred to established research and evaluation organization such as universities, the WasteReuse Foundation, the Southern California Salinity Coalition, the US Bureau of Reclamation, and research foundations/organizations, which are better suited to assess them. In many cases, Metropolitan contributes to these organizations or works in collaboration with them and can benefit from a broader base of agencies or perspectives. However, Metropolitan staff will evaluate proposals warranting more specific evaluation for applications to Metropolitan's service area.

**ISP Projects**

<b>Project Title</b>	<b>Project Proponent</b>	<b>Supply Aspect</b>
Assessment of Opportunities to Recover Stormwater Runoff for Groundwater Recharge in the Calleguas Creek Watershed	West Cost Environmental & Engineering	Storm runoff for groundwater recharge
Dewevaporation with Liquid Desiccant Enhancement	L'Eau LLC	Recycled water quality
Evaporation Control in Southern California	Flexible Solutions Inc.	Reservoir yield
Feasibility Evaluation of On-Site Water Recycling for Three Southern California Golf Courses	Southern California Golf Association	Recycled water
Horno Water Quality Basin Urban Runoff Recovery Project	Santa Margarita Water District	Storm runoff for groundwater recharge
LA Aquifer Aquasystem Trial, SAGES 1 Foot Unit	Egmond Associates Ltd	Storm runoff for groundwater recharge
San Antonio Canyon Surface Water Supplement Supply	Six Basins Water Master	Storm runoff for groundwater recharge
System-Wide Reservoir Reoperation to Augment California's Water Supply	Natural Heritage Institute	Reservoir yield
Urban Runoff Infiltration under Parkways for Groundwater Recharge	City of Santa Monica	Storm runoff for groundwater recharge
Waterbag Transport and Storage Technology for Brine Disposal	Terry Spragg & Associates	Recycled water quality