



- Board of Directors
Water Planning and Stewardship Committee

7/12/2011 Board Meeting

9-3

Subject

Review of in-region contractual groundwater storage programs

Description

Metropolitan has a strong history of developing programs that work with groundwater basins within the region to provide local and regional benefits. For decades, Metropolitan has provided imported water for recharge of the region's groundwater basins. The Replenishment Service Program provides surplus imported water for groundwater recharge on an interruptible basis and at a discount price. As another means of providing replenishment, cyclic storage agreements allow replenishment deliveries when water and delivery capacity are available but local funds to purchase the water are not available. The Replenishment Service Program is currently under review and recommendations on the future of the program will be presented to the Board in December 2011. Metropolitan has also developed the Groundwater Recovery Program to provide incentives for member agencies to develop new potable water supplies by treating unusable or contaminated groundwater. Lastly, the Conjunctive Use Program (CUP) was created to develop in-region groundwater storage for dry-year use. This letter reviews the history, performance and status of the CUP agreements and provides observations based on experience to date.

Metropolitan's Integrated Water Resources Plan (IRP) targets the development of in-region groundwater storage for dry-year supplies that could improve regional reliability. In 2000, Metropolitan pursued an agreement with the California Department of Water Resources to administer \$45 million of Proposition 13 funds for the development of groundwater storage programs in Metropolitan's service area. Based on the IRP policy and available Proposition 13 funding, Metropolitan and the member agencies developed nine active groundwater storage programs. These programs provide approximately 212,000 acre-feet (AF) of contracted storage space and ability for Metropolitan to call 70,000 AF of annual yield.

Groundwater Storage Program Overview

The Board adopted principles in January 2000 to guide development of contractual groundwater storage programs with member agencies ([Attachment 1](#)). To award Proposition 13 funds, Metropolitan established a set of criteria and issued a request for proposals to the member agencies to develop storage programs. A basic agreement form was developed that was then tailored to address the specific characteristics of each program. The framework remained consistent for all programs and under the terms Metropolitan would:

1. Enter the storage agreement with an interested member agency for a term of 25 years.
2. Provide capital funds for development of facilities needed to implement each program. Metropolitan added \$26.1 million of its funds to the Proposition 13 funds for the nine programs. Facilities would be constructed, owned, operated and maintained by the participating member agency.
3. Form an operating committee with other agreement parties for each program to develop an annual operating plan and review costs and performance.
4. Have the ability to store water up to a maximum capacity. The maximum capacity was determined based on the abilities and needs of the basin and the participating member agency.

5. Store a specified amount of water each year, at its discretion. Programs were designed to fill over a period of four years.
6. Call for production of a specified amount of stored water over a 12-month period, at its discretion. Programs were designed to be emptied over a period of three years.
7. Bill the water at the full service rate in effect at the time that the water is produced for a call. A credit would be applied to cover the cost of power and operation and maintenance for producing the called water.
8. Measure performance on a call using three criteria:
 - a. Reduction in service connection deliveries by the call amount;
 - b. Increase in groundwater production by the call amount; and
 - c. Production of called amount of water from Metropolitan's storage account in the groundwater basin.
9. Have the ability to assess a penalty for nonperformance for each AF of underperformance on a call. The penalty would be two times the Tier 2 water rate in effect at the time of call.
10. Pay an annual administrative fee to a participant on each agreement.

As mentioned earlier, these basic terms were the basis of establishing the nine active storage programs. A more detailed description of the nine in-region groundwater storage programs is provided in [Attachment 2](#).

Observations

Each of the current nine program agreements have been in place for at least five years. Many of the programs have been operated through one full cycle of storage and extraction. The following discussion highlights key observations on the performance of the programs through this first cycle of use.

Regional and local benefits can be achieved. The programs provided local benefits including funds for facilities that are owned and operated by local agencies and integrated into the local water infrastructure. These facilities provide for additional extraction capacity, interconnections, and contaminant removal. Storage under the programs also raised water levels in the participating groundwater basins reducing pumping lifts. For example, the Orange County Water District used the program in the Orange County Basin to assist with management of seawater intrusion by storing water along the coast and producing water for calls further inland.

The programs helped Metropolitan to manage surplus imported water during wet years by providing for storage of over 150,000 AF. This water was held with minimal loss in the local groundwater water basins. The programs provided regional benefit during the recent water supply allocation by reducing the severity of the imported water shortage. Nearly 137,000 AF were produced from these programs and this water counted as part of the allocations for the participating member agencies, thus reducing the need to deliver imported supplies during drought conditions. The second cycle was initiated this year with requests to store water. Nearly 30,000 AF are in storage in these accounts as of June 2011. Performance of the calls on these programs is summarized in [Attachment 3](#). The Las Posas Groundwater Storage Program with Calleguas MWD was recently terminated due to changed local conditions that resulted in an inability for that program to provide regional benefit.

Flexibility is important. Each program agreement is based on the program terms outlined above. The unique physical and institutional characteristics affecting the capabilities and management of each groundwater basin were addressed with refinements of the basic terms.

These programs are integrated into the day-to-day operations of the participating member and local agencies to provide for storage, extraction and maintenance of facilities. As a result, program operations are affected by a wide variety of factors beyond the control of the agreement parties. These factors include weather, water demands, economic growth patterns, local budgets and politics, groundwater contamination, blending requirements, increasingly stringent drinking water quality standards, facility maintenance scheduling by other agencies, and imported and local water surpluses and shortages. Flexibility is key to establishing and maintaining

beneficial programs that can navigate the unique characteristics of each groundwater basin and the changing conditions affecting each agreement participant.

Administrative issues present a challenge. Each program agreement specifies annual storage and extraction amounts that Metropolitan may exercise on 15 days' notice to the participating member agency. Given unique circumstances in each groundwater basin, Metropolitan staff has learned that it is necessary to work cooperatively with the participating agencies to achieve storage and extraction. Staff often works with the participating agencies to juggle multiple objectives of the parties and to avoid conflicts. Issues may range from the operational ability to produce supplies in a given time period to determining the appropriate operating credit an agency will receive for pumping water. This partnering is in the interest of all parties to maximize performance and mutual benefit while also minimizing risk.

Parties must agree on how to share responsibilities and risk. The groundwater storage programs involve commitments on the part of Metropolitan and member agency and local agency participants. Metropolitan provides upfront facility funding and water for storage. The participating member and local agencies oversee Metropolitan's stored water and commit to produce it at a future time irrespective of other unanticipated complicating factors.

The Board adopted principles in 2000 to guide development of groundwater storage programs with member agencies ([Attachment 1](#)). The principle for risk sharing states:

There are risks associated with developing any water resource program, including groundwater storage. Metropolitan should be willing to share the appropriate risk of implementing groundwater storage programs with local entities to the extent benefits outweigh the risks.

Concern with how to share future risk associated with potential unknown groundwater quality issues has prevented Metropolitan from reaching agreement for a storage program with one member agency. Other unanticipated situations have affected some of the current storage programs. Contamination of groundwater quality has changed local groundwater operating patterns. Changes to anticipated growth and water demand patterns have led to increased operating costs. Changes to the pattern of imported water surplus and shortage have altered Metropolitan's parameter of storing over four years and extracting over three years. Agreement on how to share risk is important to the future of partnerships among Metropolitan, member and local agencies. In most cases, the operating committees established by these agreements have allowed Metropolitan to work collaboratively with the member agencies to tackle these challenges.

Next Steps

Metropolitan is working through processes with the member agencies that will affect the conjunctive management of imported water with groundwater supplies. The current review of the Replenishment Service Program will conclude by December 2011 with recommendations for board consideration. Rate increases for years beyond 2012 contemplated in the long range finance plan will also affect how the member agencies develop local supplies and utilize imported water for replenishment and dry-year conjunctive use. Staff is working through these processes and the operating committees of the current storage programs to improve the conjunctive management of imported supplies and groundwater resources going forward.

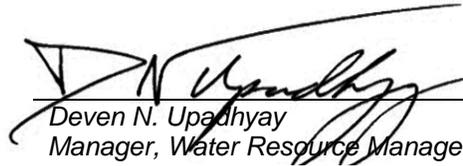
Policy

Metropolitan Water District Administrative Code Section 4209: Contracts

By Minute Item 43860, dated January 11, 2000, the Board approved strategies and principles for implementing groundwater storage program within Metropolitan's service area.

Fiscal Impact

Not applicable


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6/29/2011
Date


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General Manager

6/29/2011
Date

Attachment 1 – Metropolitan’s Groundwater Storage Principles

Attachment 2 – Summary of Active Groundwater Storage Programs

Attachment 3 – Overview of Groundwater Storage Program Call Performance

Ref# wrm12612472

Metropolitan's Groundwater Storage Principles

- **Regional Benefit** – Groundwater storage programs must provide regional benefits to increase dry-year supply (in accordance with the board's Water Surplus and Drought Management Plan) and reduce capital costs associated with Metropolitan's distribution system. Benefits must outweigh the risks involved with developing the program.
- **Partnership** – Groundwater storage programs must have strong local support in order to be successful. Partnership might also involve coordination of funds from other sources (e.g., state/federal funds).
- **Address Local Needs** – When developing groundwater storage programs, Metropolitan must consider the individual needs of the groundwater basin and local communities. Programs should consider issues such as water quality, reliability of supply, financial benefits and groundwater level.
- **No Unmitigated Negative Water Supply or Water Quality Impact** – Groundwater storage programs should be designed so there are no negative water quality or supply reliability impacts to Metropolitan's member agencies.
- **Financial Integrity** – Programs should ensure the financial integrity of Metropolitan and its member agencies consistent with the Strategic Plan Policy Principles (principles) which was approved by the Board on December 14, 1999. The Principles will be included in a new Strategic Plan to be adopted next year. Investments made by Metropolitan for storage will not be used by local agencies to reduce their demands for Metropolitan's imported supply in a manner that threatens financial integrity. Participating member agencies would commit to the purchase of fixed amounts of imported water from Metropolitan.
- **Phased Approach** – Groundwater storage programs should be implemented in phases. At first, smaller-scale programs should be designed to meet overlying demand in lieu of Metropolitan's surface deliveries. As the programs are operated, levels of trust can be established and technical issues resolved. If successful, these programs can be expanded to the point where groundwater can be exported to other parts of the service area.
- **Shared Risk** – There are risks associated with developing any water resource program, including groundwater storage. Metropolitan should be willing to share the appropriate risk of implementing groundwater storage programs with local entities to the extent benefits outweigh the risks.

MWD Board Adoption: January 2000

Summary of Active Groundwater Storage Programs

Long Beach Groundwater Storage Program

The agreement for the Long Beach Groundwater Storage Program was signed in July 2002 for a term of 25 years. The city of Long Beach Water Department acting through its Board of Water Commissioners is the participating member agency for this program. \$4.5 million of Proposition 13 funds administered by Metropolitan were provided for construction of 4 wells and a pipeline. The agreement allows for storage of 13,000 AF at a rate of 3,250 AF per year. Stored water may be called at a rate of 4,333 AF per year. The storage program is located in the Central Basin and utilizes Long Beach's rights under the basin adjudication for carryover storage and permissible over extraction. The storage account balance is 6,402 AF as of June 2011.

Foothill Groundwater Storage Program

The agreement for the Foothill Groundwater Storage Program was signed in February 2003 for a term of 25 years. The participating member agency is Foothill Municipal Water District. Operating Parties under the agreement are five retail agencies of Foothill Municipal Water District with rights to produce groundwater from the Raymond Basin. \$1.7 million of Proposition 13 funds administered by Metropolitan were provided for construction of a pump station upgrade, 2 well conversions to aquifer storage and recovery (ASR), interconnections and pipelines. The agreement allows for storage of 9,000 AF at a rate of 2,250 AF per year. Stored water may be called at a rate of 3,000 AF per year. The storage program is located in the Monkhill subbasin of the Raymond Basin. The Raymond Basin Management Board authorized storage for the program and provides accounting for the program in its annual report. The storage account balance is 522 AF as of June 2011.

Chino Basin Groundwater Storage Program

The agreement for the Chino Basin Groundwater Storage Program was signed in June 2003 for a term of 25 years. Agreement participants are Inland Empire Utilities Agency (IEUA), Three Valleys Municipal Water District (TVMWD), and the Chino Basin Watermaster. Operating Parties under the agreement are eight retail agencies of IEUA, TVMWD, and Western Municipal Water District with rights to produce groundwater from the Chino Basin. Funds provided for program facilities total to \$27.5 million with \$9.4 million from Proposition 13 funds administered by Metropolitan and \$18.1 million of Metropolitan funds. Funded facilities are ten wells, six new or expanded treatment facilities for nitrates and volatile organic compounds (VOCs), and a new brine line. The agreement allows for storage of 100,000 AF at a rate of 25,000 AF per year. Stored water may be called at a rate of 33,000 AF per year. The Chino Basin Watermaster authorized storage for the program and provides accounting for the program in its annual report. The storage account balance is 0 AF as of June 2011.

Orange County Groundwater Storage Program

The agreement for the Orange County Groundwater Storage Program was signed in June 2003 for a term of 25 years. The agreement participants are the Municipal Water District of Orange County (MWDOC) and Orange County Water District. Operating Parties under the agreement are five retail agencies of MWDOC, Anaheim, and Santa Ana with rights to produce groundwater from the Orange County Basin. Funds provided for program facilities total to \$23 million with \$15 million from Proposition 13 funds administered by Metropolitan and \$8 million of Metropolitan funds. Funded facilities are eight wells and improvements to the Talbert Seawater Barrier. Additionally, Metropolitan constructed the Yorba Linda Feeder Bypass at a cost of \$8.92 million as part of the package. The bypass allows untreated water that is largely from the State Water Project to be delivered to Orange County Basin spreading facilities. The agreement allows for storage of 66,000 AF at a rate of 16,500 AF per year. Stored water may be called at a rate of 22,000 AF per year. The Orange County Water District authorized storage for the program and provides accounting for the program in its annual report. The storage account balance is 16,500 AF as of June 2011.

Live Oak Basin Groundwater Storage Program

The agreement for the Live Oak Basin Groundwater Storage Program was signed in October 2002 for a term of 25 years. The agreement participants for this program are TVMWD and the City of LaVerne. \$3.3 million of Proposition 13 funds administered by Metropolitan were provided for construction of a well, a nitrate treatment

facility, and a spreading connection on the San Gabriel Valley Municipal Water District pipeline. The groundwater storage agreement makes use of the Alhambra Exchange Agreement between Metropolitan and San Gabriel Valley Municipal Water District for delivery of water for storage. The agreement allows for storage of 3,000 AF at a rate of 750 AF per year. Stored water may be called at a rate of 1,000 AF per year. The storage program is located in the Live Oak Basin, one of the Six Basins. The City of LaVerne is the only producer in this basin and tracks the storage account balance with Metropolitan. The storage account balance is 687 AF as of June 2011.

Compton Groundwater Storage Program

The agreement for the Compton Groundwater Storage Program was signed in February 2005 for a term of 25 years. The city of Compton is the participating member agency for this program. \$2.4 million of Proposition 13 funds administered by Metropolitan were provided for construction of a well and pipeline. The agreement allows for storage of 2,289 AF at a rate of 572 AF per year. Stored water may be called at a rate of 763 AF per year. The storage program is located in the Central Basin and utilizes Compton's rights under the basin adjudication for carryover storage and permissible over extraction. Under the agreement, Compton stores half of the storage (1,144 AF) using its carryover rights in the basin. The second half of the storage would be overproduced upon call using Compton's permissible over extraction rights and replaced thereafter. If the proposed judgment amendment for storage is approved in the Central Basin, all storage will be made in advance of the call. The storage account balance is 0 AF as of June 2011.

Expansion of Long Beach Groundwater Storage Program

The agreement for the Expansion of the Long Beach Groundwater Storage Program was signed in July 2005 for a term of 25 years. The city of Long Beach Water Department acting through its Board of Water Commissioners is the participating member agency for this program. The city of Lakewood is an operating party under the agreement. \$2.7 million of Proposition 13 funds administered by Metropolitan were provided for construction of a well, pipeline and interconnection. The agreement allows for storage of 3,600 AF at a rate of 900 AF per year. Stored water may be called at a rate of 1,200 AF per year. The storage program is located in the Central Basin and utilizes Lakewood's rights under the basin adjudication for carryover storage and permissible over extraction. The storage account balance is 900 AF as of June 2011.

Upper Claremont Heights Basin Groundwater Storage Program

The agreement for the Upper Claremont Heights Basin Groundwater Storage Program was signed in September 2005 for a term of 25 years. The participating member agency for this program is TVMWD. \$1.2 million of Proposition 13 funds administered by Metropolitan were provided for construction of a well and pipeline. The agreement allows for storage of 3,000 AF at a rate of 750 AF per year. Stored water may be called at a rate of 1,000 AF per year. The storage program is located in the Upper Claremont Basin, one of the Six Basins. The Six Basins Watermaster authorized storage for the program and provides accounting for the program in its annual report. The storage account balance is 1,442 AF as of June 2011.

Elsinore Groundwater Storage Program

The agreement for the Elsinore Groundwater Storage Program was signed in December 2006 for a term of 25 years. Agreement participants for this program are Western Municipal Water District and Elsinore Valley Municipal Water District. \$4.7 million of Proposition 13 funds administered by Metropolitan were provided for construction of two ASR wells and a pipeline. The agreement allows for storage of 12,000 AF at a rate of 3,000 AF per year. Stored water may be called at a rate of 4,000 AF per year. The storage program is located in the Elsinore Basin. Elsinore Valley Municipal Water District is the only producer in this basin and tracks the storage account balance with Metropolitan. The storage account balance is 2,569 AF as of June 2011.

Overview of Groundwater Storage Program Call Performance

Storage Program	Agreement Effective Date	Call Period	Call Amount AF	AF Produced
Long Beach Groundwater Storage Program	July 2002	July 1, 2007 - June 30, 2008	4,333	2,416
		July 1, 2008 - June 30, 2009	up to 4,333	4,182
Foothill Groundwater Storage Program	Feb 2003	Nov 1, 2007 – Oct 31, 2008	1,500	1,765
		Nov 1, 2008 - Oct 31, 2009	1,200	1,032
Chino Basin Groundwater Storage Program	June 2003	May 1, 2008 - Apr 30, 2009	33,000	33,000
		May 1, 2009 - Apr 30, 2010	33,000	33,000
		May 1, 2010 - Apr 30, 2011	17,000	17,000
Orange County Basin Groundwater Storage Program	June 2003	July 1, 2008 - June 30, 2009	22,000	23,344
		July 1, 2009 - June 30, 2010	22,000	23,380
Live Oak Basin Groundwater Storage Program	Oct 2002	No calls	0	0
Compton Groundwater Storage Program	Feb 2005	July 1, 2008 - June 30, 2009	572	572
		July 1, 2009 - June 30, 2010	572	572
Expansion of Long Beach Groundwater Storage Program	July 2005	Sept 1, 2009 - June 30, 2010	900	900
Upper Claremont Heights Basin Groundwater Storage Program	Sept. 2005	No calls	0	0
Elsinore Groundwater Storage Program	Dec. 2006	July 1, 2008 - June 30, 2009	431	431
Totals			140,841	136,619