- **Board of Directors**
  Water Planning, Quality and Resources Committee

November 8, 2005 Board Meeting

9-4

Subject

Transmittal of 2005 Integrated Water Resources Plan Implementation Report

Description

Attachment 1 is a copy of Metropolitan's 2005 Integrated Water Resources Plan Implementation Report. As part of its approval of the 2004 IRP Update the Board directed staff to provide regular updates on the status of actions and programs developed to meet water supply targets. Similar reports prior to the IRP Update were provided to the Board in 1998, 2001 and 2002 that marked the progress toward meeting the original 1996 IRP targets.

The report discusses each resource category, including changed conditions and implementation status of operational and identified programs and projects. Expected yields from these programs and projects are evaluated to determine the extent to which they would help meet or exceed the IRP targets. The report also discusses where existing programs should be refined and/or new programs or strategies should be developed and implemented. Staff will return to the Board for consideration and action to implement any new programs or for any action required to modify resource targets or implementation policy.

The Report findings can be summarized as follows:

- **Total supply portfolio:** When viewed altogether, the total supplies from existing and identified projects are projected to meet or exceed the overall target. Therefore Metropolitan expects to continue to meet supply reliability goals through 2025.
- **Changed conditions:** Over the last year, some conditions on which the resource plans were developed have changed. In some cases the change was negligible or positive, while in some cases changes impacted resource projections. Significant changed conditions include:
  - The new reliability study by the California Department of Water Resources (DWR) states that State Water Project (SWP) Table A deliveries may be significantly reduced in a 1977-type of hydrologic year compared to a previous DWR study. IRP targets are based on projected single dry-year demands; therefore, this will require reexamination of the components of the SWP target. It is important to note, however, that Metropolitan's storage and transfer programs that utilize the SWP system help to augment these imported supplies, in effect reducing the impact of single dry-year shortages.
  - Unforeseen delays or deferrals in some in-basin groundwater conjunctive use programs are expected to delay efforts to reach IRP targets for this resource. Additional programs and approaches will likely be required to bring this resource closer to the future IRP targets. But, this temporary shortfall is balanced by in-basin surface storage, which is currently projected to exceed IRP targets.
- **Planning supply buffer:** The concept of the buffer has been successfully demonstrated by the fact that both local Recycling/Groundwater Recovery/Desalination resources and the Central Valley Storage and Transfer resources have been identified to exceed their IRP targets. As a result, Metropolitan is still able to meet all future dry-year demands in part because of the additional supplies identified through the planning supply buffer.

While at least some change has occurred in all resource areas, the IRP Implementation Report acknowledges that Metropolitan is able to maintain future supply reliability through its diversified water resources portfolio. Core supplies and existing programs are always susceptible to changing influences, and therefore all targets continue to

be evaluated and refined. The IRP's adaptive planning framework, together with annual implementation reporting and a five-year update cycle, allows Metropolitan and its member agencies to continue to refine and revise the resource targets as new information and technologies become available.

Policy

By Minute Item 41734, dated Jan. 9, 1996, the Board approved the Integrated Water Resources Plan.

By Minute Item 44696, dated Nov. 20, 2001, the Board adopted the Integrated Water Resources Plan Update workplan.

By Minute Item 45841, dated July 13, 2004, the Board approved the Integrated Water Resources Plan Update report and the regular interval of IRP Implementation Reports and IRP updates.

10/25/2005
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Manager, Water Resource Management

10/25/2005
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CEO/General Manager

Attachment 1 – 2005 Integrated Water Resources Plan Implementation Report

BLA #3833

INTEGRATED WATER RESOURCES PLAN UPDATE

IMPLEMENTATION REPORT

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

NOVEMBER 2005

Metropolitan Water District of Southern California

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Metropolitan's Integrated Resources Plan

The framework for Southern California's regional water planning is the Integrated Water Resources Plan (IRP), adopted by Metropolitan Water District's Board of Directors in 1996. The 1996 IRP provided a 20-year plan that balanced locally developed and imported water supplies. It called for greater investment in water conservation, recycling, groundwater treatment, storage, and water transfers. These investments brought the region diversity and flexibility to improve overall water supply reliability. The IRP was designed to meet the region's reliability goal of "100% of full service demands at the retail level under all foreseeable hydrologic conditions." The IRP has proved a success from both a planning and implementation standpoint.

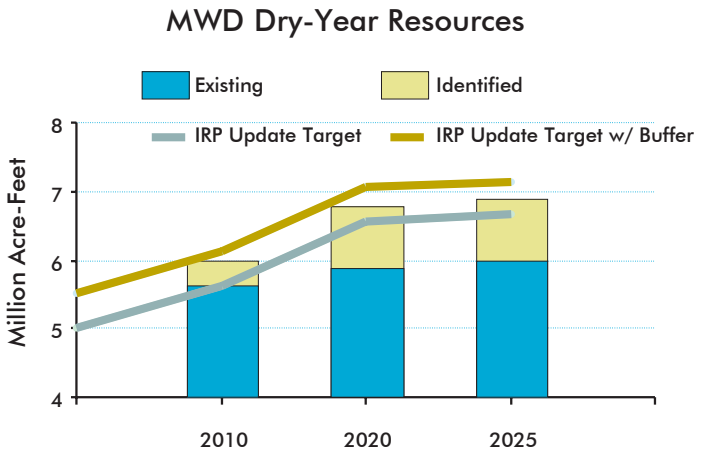
The IRP Update built upon the success of the 1996 IRP and maintained the original vision of a reliable, diverse and flexible resource strategy for the region. The IRP Update had three clear objectives:

(1) to review the goals and achievements of the 1996 IRP;

(2) to identify changed conditions for water resource development;

(3) to update the resource targets through 2025.

EXECUTIVE SUMMARY



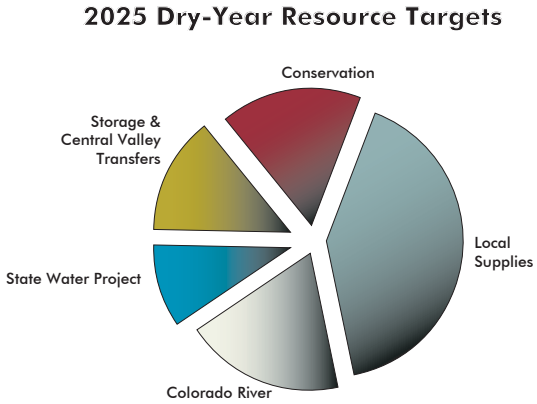
The main conclusion from the IRP Update is that the resource targets from the 1996 IRP, even with changed conditions factored in, will continue to meet the region's reliability goal through 2025. The report also concluded that the region's reliability should be reinforced through continually improving and maintaining supply contingency plans. Contingency planning has served the region well in the recent past – our diverse resource mix gave Southern California the flexibility to withstand operational interruptions like the rehabilitation of the Colorado River Aqueduct in 2003, and unforeseen reductions in flow due to historically dry conditions. Even with these challenges, Metropolitan was able to set aside 500,000 acre-feet of water in storage.

IRP Implementation Report

This IRP Implementation Report fulfills a policy set by Metropolitan's Board during the adoption of the IRP Update Report in July 2004 which requires regular updates on the status of actions and programs developed to meet water supply targets. Similar reports prior to the IRP Update were provided to Metropolitan's Board in 1998, 2001 and 2002.

Consistency with Published Reports

The data and analytical results included in this report are consistent with Metropolitan's 2005 Regional Urban Water Management Plan. Data on locally developed supplies and future projections were obtained through coordination with member agencies during the development of the RUWMP.



The 2003 IRP Update: maintaining a balance between imported and local supplies.

Implementation Report Framework

Resource target components (programs or groups of actions) were evaluated for their likelihood of producing a range of supplies for a single dry year. These values were then summed for each resource and compared against their IRP targets for years 2010, 2020, and 2025. The resources were determined either to have met (or exceeded), or to be at risk of not meeting their respective targets. Where resources were determined to be at risk of not meeting the IRP targets, implementation *Challenges* and potential *Strategies* are discussed.

Changed Conditions

Changed conditions since the IRP Update are responsible for the determination that some targets are at risk of not being met.

Example: State Water Project Supplies

Some uncertainty has been introduced to Metropolitan's expectations of dry-year supplies from the State Water

Planning Supply Buffer

Metropolitan's Board, in approving the IRP Update, directed that a planning buffer supply is necessary to hedge against evolving resource implementation risks and supply/demand uncertainty. The IRP Update called for the identification of buffer strategies, over and above those supplies described in the IRP Targets, in the amount of 500,000 acre-feet, equal to approximately 10 percent of projected retail water demand in 2025, with identified strategies split between imported and local supplies.

Updated Resource Targets (with Supply Buffer)

	1996 IRP 2020	IRP Update 2020	Change	IRP Update 2025
Conservation	882,000	1,028,000	+145,600	1,107,000
Local Resources - Recycling - Groundwater Recovery - Desalination	500,000	750,000	+250,000 (buffer)	750,000
Colorado River Aqueduct *	1,200,000	1,250,000	+50,000	1,250,000
State Water Project	593,000	650,000	+57,000	650,000
Groundwater Conjunctive Use	300,000	300,000	0	300,000
CVP/SWP Storage and Transfer	300,000	550,000	+250,000 (buffer)	550,000
MWD Surface Storage **	620,000	620,000	0	620,000
Local Production***	1,911,193	1,911,193	0	1,922,608

*The 1,250,000 acre-feet supply from the Colorado River Aqueduct is a target for dry year s when needed. Metropolitan is not depending upon a full aqueduct in every year.
**Target for Surface Storage represents the total amount of water that can be extracted from storage.
***Local Production (non MWD-sponsored) does not have an IRP target; the estimates were used to formulate other resource targets.

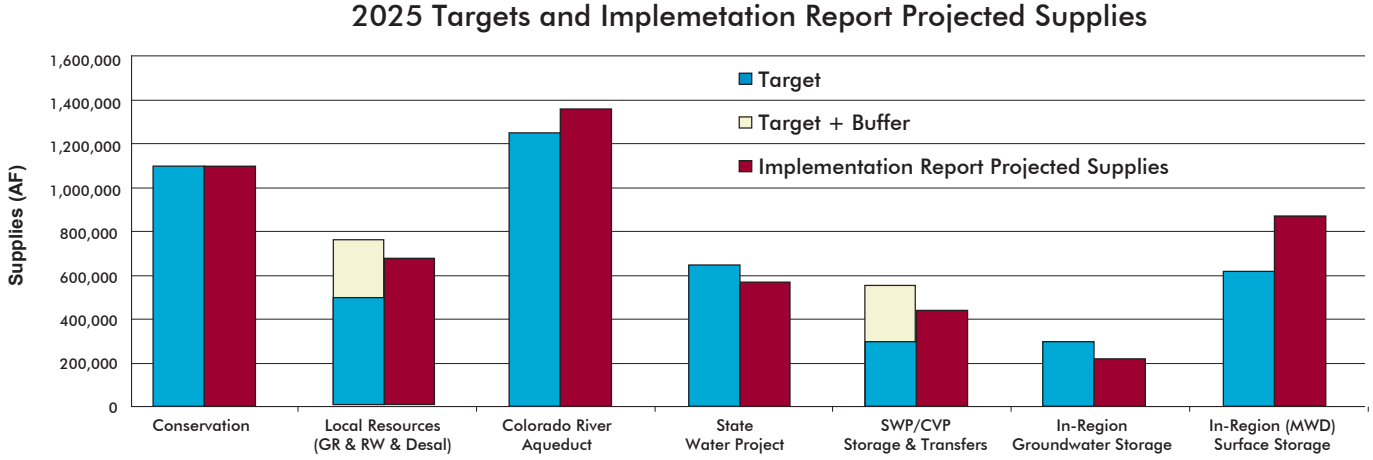
Project (SWP). According to a new reliability study by the Department of Water Resources (DWR), SWP Table A contracted deliveries may be significantly reduced in a 1977-type of hydrologic year as compared to previous study results (refer to the State Water Project section for details). Other SWP issues, such as the CALFED Bay-Delta Program, have changed (and may continue changing), suggesting that Metropolitan staff may need to identify and develop additional programs or actions to meet the SWP IRP target.

Other resources also have been found to be at risk of not meeting IRP targets; further discussion of these resources follows. In response to the various changes identified, Metropolitan staff will continue to identify potential new programs and strategies that can be implemented, when needed, to maintain Metropolitan's water supply reliability.

Overall finding

When viewed all together, the portfolio of existing and identified dry-year supplies slightly exceeded the sum of all the targets. These existing and identified projects are currently projected to continue to meet the overall IRP needs set forth in the IRP Update through 2025. However, as already stated, some components of the resource targets have been deemed less certain, at risk, or not available for implementation. Even core contracted supplies and existing programs are susceptible to changing influences, and therefore all resources will require continued monitoring and evaluation.

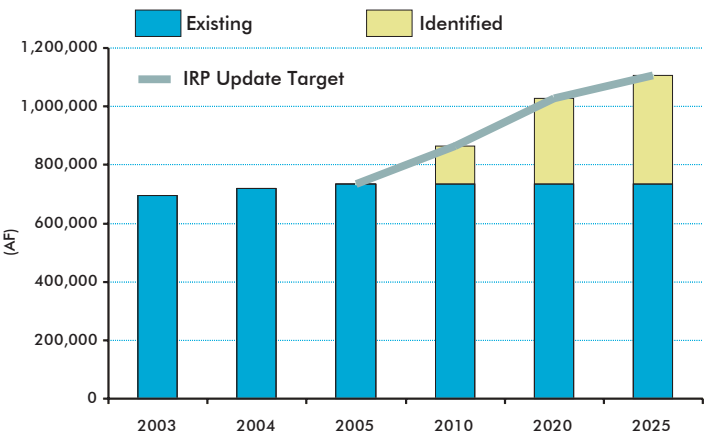
Where needed, future resource opportunities consistent with the planning buffer adopted as part of the IRP Update will be identified and pursued as needed and brought for consideration to Metropolitan's Board.



A comparison of the current extent of development of dry-year resources against the IRP Update targets for 2025.

Status of Resource Targets

Conservation



Summary:

- Code-based and price-effect conservation make up a significant portion of the "Identified" future supplies; these are projected to grow, providing significant future conservation savings
- Active conservation programs will provide the remaining balance of the "Identified" future conservation to reach IRP targets

Conservation

IRP conservation targets presume regional compliance with the Best Management Practices (BMPs). The BMPs complement agency-induced water use efficiency programs (termed *active* conservation) and estimates of *code-based* conservation savings (previously referred to as passive conservation). Code-based conservation includes ongoing refinements to plumbing codes and retrofit-on-resale ordinances in many cities including Los Angeles and San Diego. Total conservation targets for Metropolitan's service area use 1980 as a base year for measuring savings, and include effects of increasing retail water rates and savings from the 1990 plumbing code.

Targets

The IRP targets for annual conservation savings are:

- 865,000 acre-feet by 2010
- 1,028,000 acre-feet by 2020
- 1,107,000 acre-feet by 2025

Current and future strategies to meet these targets focus on implementing more *active* conservation, achieving savings through legislative measures where appropriate, and pursuing strategies identified in Metropolitan's Conservation Strategic Plan, jointly developed with its member agencies.

About 730,000 acre-feet of water per year has been developed by conservation through FY 2005 using 1980 as a base year to measure savings.

Current Considerations and/or Changed Conditions

Active conservation savings programs have been dominated by incentives to retrofit with ultra low flush toilets (ULFTs). As ULFT retrofit opportunities are being exhausted, Metropolitan is focusing on other sectors of water use for conservation. These include landscape irrigation, new homes, and commercial/industrial/ institutional (CII) applications.

Some progressive steps that Metropolitan has taken to further develop these opportunities include:

- Media outreach in support of landscaping changes and irrigation efficiency; part of a branding effort for "California Friendly" landscapes;
- Initiatives and pilot programs to encourage housing developers and builders to incorporate a higher level of water efficiency than is required by plumbing codes;
- Continued efforts to identify new technologies with promising savings potential through the Innovative Conservation Program;
- Entering into partnerships with electric utilities, wastewater agencies, and other entities that can benefit from water conservation.

These steps are expected to prove effective in the effort to continue managing regional water demand.

Implementation Strategies and Identified Programs

The approach for identifying and implementing new

active conservation programs uses the *Five-Year Conservation Strategy Plan* mentioned above.

The current Conservation Strategy Plan (March 2005) identifies active conservation programs that could save approximately 145,000 acre-feet of water by the year 2009.

Implementation Challenges

The challenge to meeting the IRP targets for conservation is to devise effective approaches to implement the new programs in the sectors previously identified. There is still significant work ahead in developing the relationships with other development and utility interests, which can lead to mutually beneficial conservation programs. Other challenges exist in encouraging greater public participation in active conservation programs, and Metropolitan continues to help fund efforts to inform the public and encourage participation.

Cost Information

In FY 2004, Metropolitan invested approximately $22 million in various conservation programs and incentives. About $16.7 million of this total was spent through Metropolitan's Conservation Credits Program (CCP). It is estimated that active conservation programs over the same time period saved over 101,000 acre-feet of water.

In FY 2005, more than $10 million was invested through the CCP, with water savings estimated at more than 112,000 acre-feet. The reduced spending is primarily due to saturation of residential ULFTs and reductions in commercial high-efficiency clothes washer incentives.

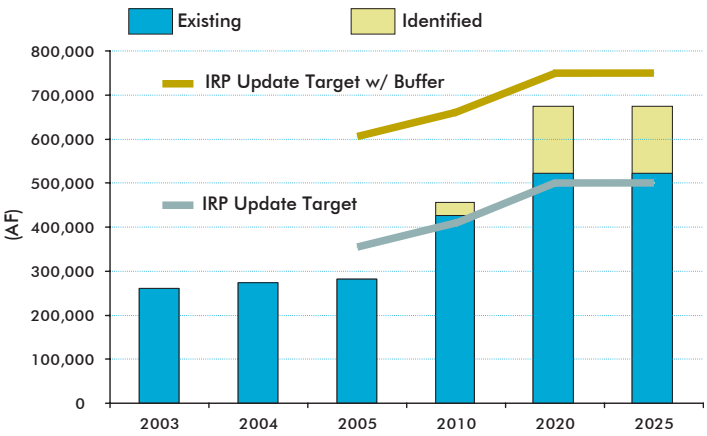
Views on *water conservation* are changing: once associated with mandatory reductions in water use (typically during severe drought), conservation practices are gaining wider acceptance as beneficial, *water use efficiency* measures. The region's history of recurrent droughts (such as those in 1976-77 and 1987-1992) support the need to invest in long-term water use efficiency balanced with new supply development and revised management strategies.

Over the past 20 years, implementation of water-use efficiency programs has heightened individual and public recognition of the importance of conservation and underscores the fact that choices individuals make have an impact on the region's water resource picture. Metropolitan's programs are proactive and help sustain our standards of living without onerous mandatory drought restrictions on water use.

An example of "California Friendly" landscaping

Status of Resource Targets

Recycling, GW Recovery & Desalination



Summary:

- "Identified" local resource program components include projects that have been committed to development. These committed projects are expected to help exceed IRP targets
- Additional programs or actions will be considered as needed to meet future demands

Local Resources – Recycling, Groundwater Recovery & Seawater Desalination

Recycled water production in the Southern California region is primarily developed by local water agencies. A number of newer projects have been developed using financial incentives provided through Metropolitan's Local Resources Program (LRP). The LRP is a performance-based program that provides incentives for water recycling, and also supports recovery of degraded groundwater for potable uses (groundwater recovery). The IRP targets for local resources includes these resources, which have grown to a significant amount of water produced over the past 20 years.

Targets

The IRP Update set total Local Resources targets of:

- 410,000 acre-feet in 2010;
- 500,000 acre-feet in both 2020 and 2025.

Current Considerations and/or Changed Conditions

The status of local water recycling and groundwater recovery projects can change from year to year. The trends for these programs show that production is increasing overall, however year-to-year fluctuations can occur. These fluctuations can be in response to changing weather, operational criteria, construction and permitting issues, and other factors.

Changes since the IRP Update include:

- Metropolitan's Board approved the process of executing contracts with member agencies for seawater desalination projects which will yield about 142,000 acre-feet per year;
- Additional recycling and groundwater recovery projects have been proposed.

In FY 2004, approximately 118,000 acre-feet per year of LRP water supplies were developed. Total regional reclaimed supplies developed for the same time period were approximately 273,000 acre-feet per year.

Water recycling, groundwater recovery, and seawater desalination are regional resources that add balance to the region's diverse portfolio of resource options.

Water recycling uses high-level treatment for water discharged from previous uses to make the water usable for municipal and industrial direct use, often for golf courses and other municipal irrigation needs.

Groundwater recovery employs additional treatment to make use of groundwater sources that were previously not considered viable due to high salinity or other (chemical) contamination.

Seawater desalination, removal of salts from ocean water and treating that water to potable water standards, adds another option for meeting regional supply reliability.

Implementation Strategies and Identified Programs

In March 2004, Metropolitan selected 13 projects for potential funding through the LRP, out of 27 responses received under the 2003 RFP. The deadline to execute LRP agreements for the projects under the 2003 *Request For Proposals* (RFP) is December 2005. New LRP projects are expected to start production as early as 2006.

Staff also expects to execute five seawater desalination agreements with member agencies for about 142,000 acre-feet per year.

Implementation Challenges

The most significant potential challenge to implementing local resource programs lies with large-scale seawater desalination. Seawater desalination is a potential newer resource for the region, and there are uncertainties in the process of moving from small-scale demonstration projects to larger scale projects: development decisions, technological issues, and environmental considerations are some of the challenges that remain before these projects begin delivering consistent supplies.

Cost Information

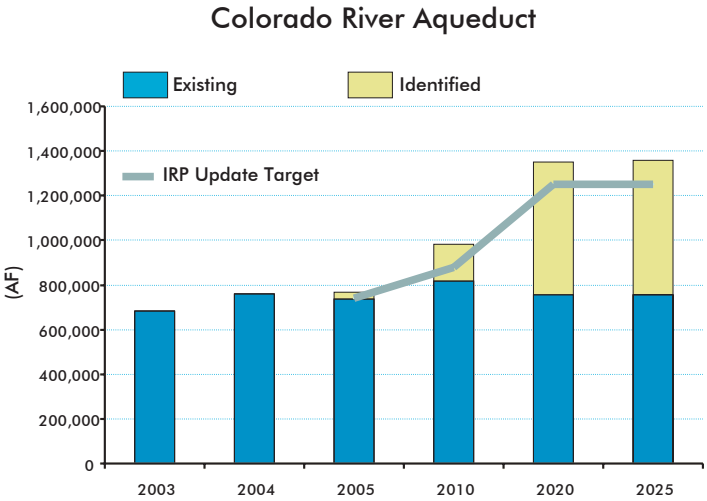
Metropolitan has invested about $180 million in partnership with its member agencies to develop these local resource programs, helping to produce more than 1 million acre-feet of recycled and treated groundwater since incentive programs began over 22 years ago.

Financial incentives requested under current RFP project proposals total about $160 million toward development of these projects over the next 25 years. These new groundwater recovery and recycled water projects are expected to collectively produce about 65,000 acre-feet per year.

In FY 2005, Metropolitan invested approximately $21.1 million toward the production of over 110,000 acre-feet of LRP supplies. Yields from these programs were actually slightly lower than the previous year due to reduced demands that resulted from record high rainfall in the region.

Recycling turns previously used water (settling tank above) into a usable resource again (garden below)

Status of Resource Targets



Summary:

- Metropolitan has identified programs and actions to meet or exceed IRP targets
- Metropolitan expects to meet the IRP targets without relying on surplus supplies

Colorado River Supplies

The Colorado River Aqueduct (CRA) provides Metropolitan with 1,250,000 acre-feet of annual capacity to move water into its service area. The target for Colorado River supplies includes not only Metropolitan's basic apportionment, but also supplies from storage and transfer programs that combine to provide full use of the capacity when needed by the region.

Targets

The IRP Update set total Colorado River targets of:

- 879,000 acre-feet in 2010
- 1,250,000 acre-feet in both 2020 and 2025.

Current Considerations and/or Changed Conditions

Quantification Settlement Agreement

On October 10, 2003, representatives from Metropolitan, Imperial Irrigation District (IID), and Coachella Valley Water District (CVWD) executed a Quantification Settlement Agreement (QSA) and other related agreements. The QSA supports Metropolitan's development plans for CRA deliveries, allowing for agricultural conservation, water transfers, and potential surplus water availability that was identified in the 1996 IRP.

Currently, about 740,000 acre-feet of water per year has been developed.

Drought Management

Fortunately, higher than average precipitation in the 2004-2005 water year helped lessen the effects of prolonged drought on the Colorado River. Five consecutive years of drought prior to 2004 caused Lake Mead to drop to its lowest level in more than 35 years. Lake Powell dropped to its lowest level since the initial filling of the reservoir in 1963. However, one year of abundant rainfall may not signal the end of a prolonged drought, and all Colorado River water users have signaled a need to develop strategies to manage potential shortfalls in water supply.

Metropolitan teamed with representatives from the Colorado River Basin states to draft a drought management plan that identified actions to reduce the impacts of the drought and help the reservoirs recover. Once implemented, the plan should delay or possibly prevent the onset of shortage conditions on the Colorado River.

Metropolitan's contract with the federal government provides a basic apportionment of 550,000 acre-feet per year of Colorado River water. Metropolitan also possesses a priority for an additional 662,000 acre-feet per year depending upon the availability of surplus supplies.

By a 1964 U.S. Supreme Court decree (Arizona v California and the Boulder Canyon Project Act), California is required to limit its annual use to 4.4 million acre-foot basic annual apportionment of Colorado River water plus any available surplus. To help keep California within the limit Metropolitan reduces its level of diversions in years when no surplus is available.

Implementation Strategies and Identified Programs

A significant part of the development strategy for Colorado River supplies is tied to the implementation of the QSA. While in the short-term, programs are not yet in place to provide the full target, these programs are expected to be developed over time. Some programs currently operating or nearly complete include:

- IID/MWD Conservation Program;
- Coachella and All-American Canal Lining Projects (San Diego County Water Authority);
- IID/San Diego County Water Authority Transfer;
- Palo Verde Land Management and Crop Rotation (PVID) Program.

Metropolitan has also identified a number of potential storage opportunities that would provide additional water supply when needed.

Implementation Challenges

Program development along the CRA and in other Colorado River user service areas is critical for reaching the CRA supply target. A number of projects are still in varying development stages. These include:

- Lake Mead Bottom Water Banking Demonstration Program;
- Hayfield Storage Program;
- Lower Coachella Storage Program;
- Chuckwalla Storage Program.

In addition to developing new programs, there are often challenges to existing programs. A current example is that some entities have recently initiated litigation designed to stop the lining of the All-American Canal. This may pose risks to Colorado River supplies.

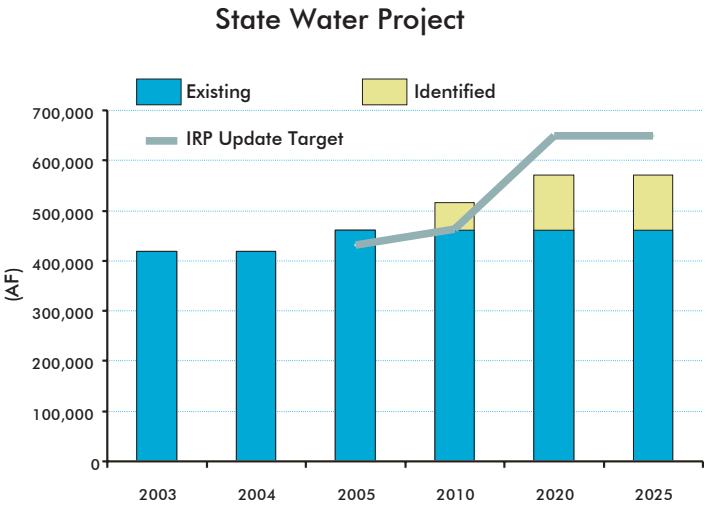
Cost Information

In addition to the regular costs associated with its basic Colorado River apportionment, in 2004 Metropolitan spent $8.6 million for its conservation program with IID. Similar expenditures are expected in 2005 and 2006, with additional payments for the PVID program estimated at about $12 million annually.

Above: automated irrigation system controls increases water use efficiency for the Imperial Irrigation District

Below: Metropolitan's Colorado River Aqueduct

Status of Resource Targets



Summary:

- Based on revised operations in DWR's Draft 2005 State Water Project Delivery Reliability Report, Metropolitan's SWP *dry-year* supplies currently may not meet IRP targets for 2020 and 2025

State Water Project Supplies

The State Water Project (SWP) target includes all water developed through the State Water Contract, including Table A supplies, carryover storage in San Luis Reservoir and exchange agreements with other SWP contractors. The target does not include flexible storage available to Metropolitan in the two terminal reservoirs, Lake Perris and Castaic Lake.

Targets

Metropolitan's Board set goals for SWP supplies with the adoption of CALFED Policy Principles in August 1999. The principles called for a two-part goal:

- 650,000 acre-feet minimum dry-year supplies from the SWP by 2020, and
- Average annual supply yield of 1,500,000 acre-feet.

These amounts excluded water transfers and storage programs that convey water through the SWP facilities.

Currently, 460,000 acre-feet of dry-year water is available from the State Water Project.

Current Considerations and/or Changed Conditions

Metropolitan's implementation approach for the SWP assumes full use of the current State Water Contract provisions (including its Table A basic contract amount, Article 21 interruptible supplies, carryover storage, Turnback Pool provisions, etc.) and implementation of a number of negotiated agreements. These agreements and programs include:

- CALFED & South Delta Improvement Program;
- The Sacramento Valley Water Management (Phase 8 Settlement) Agreement.

Based on recent analyses, future average annual SWP supplies from the South Delta Improvement Program are estimated at 130,000 acre-feet rather than the 200,000 acre-feet assumed in the IRP Update. However, expected supplies from the Phase 8 Settlement Agreement exceed the assumption in the IRP Update (approximately 55,000 acre-feet as compared to 45,000 acre-feet), and may increase further, particularly in later years with full implementation of the program.

Draft 2005 State Water Project Reliability Report

DWR recently released its Draft 2005 State Water Project Delivery Reliability Report, which projected SWP reliability using assumptions derived from the 2004 Long-Term Central Valley Project Operations Criteria and Plan.

The State Water Project, operated by the California Department of Water Resources (DWR), provides water supplies to 29 urban and agricultural agencies throughout California. SWP water supply contracts specify an ultimate firm yield of 4.17 million acre-feet. Metropolitan's share is about 46% based on its contracted "Table A" amount of 1,911,500 acre-feet.

Metropolitan's SWP water passes through the San Francisco Bay-Sacramento/San Joaquin Delta (Bay-Delta). Key challenges for SWP supplies are water quality and supply reliability, partly due to variable hydrology and environmental standards that affect pumping operations.

DWR's report affects Metropolitan's SWP picture. Based upon the draft report, average SWP deliveries are projected to increase slightly, and multiple-dry-year deliveries are not significantly changed. However, minimum SWP deliveries may be as low as 4-5 percent of the full Table A amount in the single driest year (1977 hydrology). DWR has suggested, though, that adjustments would be made to reflect more realistic operations where carryover storage and other provisions would enhance SWP dry-year deliveries to a level that is comparable in quantity to the previous reliability report from DWR.

Pelagic Organisms

Recent low pelagic fish population counts in the Delta have heightened concern about impacts to the ecosystem. If the SWP is even partially responsible for the declines (either by affecting water quality or through "take" of the key species), regulatory pumping restrictions may impact SWP supplies.

A multi-agency group, including DWR, the Department of Fish and Game, the Environmental Protection Agency and the U.S. Fish and Wildlife Service, is tasked with addressing the issue. Factors under consideration that may be contributing to the decline include changes in the Delta food-web, non-native and invasive species, various contaminants and water diversions.

Implementation Strategies and Identified Programs

CALFED & South Delta Improvement Program

Under the 1994 Bay-Delta Accord (Accord) and subsequent improvements identified in the CALFED Bay-Delta Program, SWP supplies were targeted to become more reliable and increase with approval of expanded pumping capacity at the SWP Banks Pumping Plant. Also, implementation of programs identified in the CALFED Record of Decision provides an avenue for improving future SWP reliability.

The Sacramento Valley Water Management (Phase 8 Settlement) Agreement

Metropolitan is a partner in a settlement agreement resulting from the SWRCB Bay-Delta Water Rights Phase 8 proceedings. The 2002 Sacramento Valley Water Management Agreement was designed to ensure that Bay-Delta water users equitably share the responsibility of meeting flow requirements.

The agreement includes short-term work plans to develop and manage Sacramento Valley water resources needs, environmental needs under the SWRCB's Water Quality Control Plan, and export needs for water supply and water quality. Longer-term workplans will be developed to ensure full build-out of the program. These longer-term workplans will provide further improvements to Metropolitan's SWP supply reliability.

Implementation Challenges

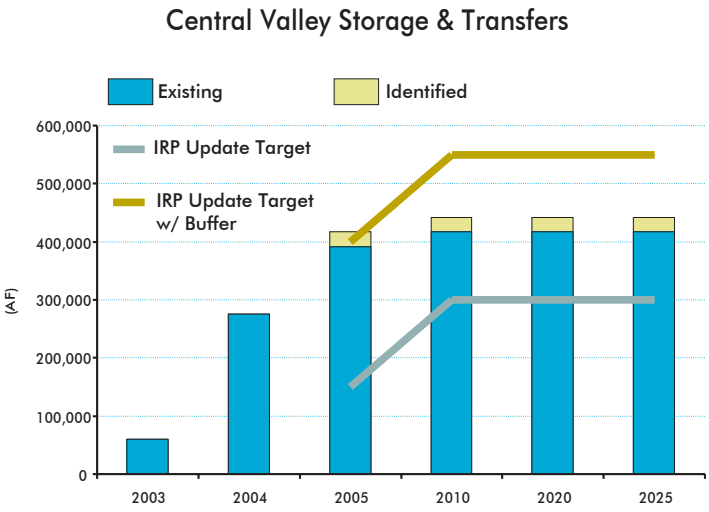
The CALFED Program needs continued support from federal/state administrations and various stakeholders to maintain and expand the improvements in Bay-Delta water quality, supply reliability, and the environment. In the near future, additional analysis and monitoring will be conducted to ensure protection and improvements to key fisheries. Environmental concerns and uncertainty related to the decline of pelagic organisms described above may affect the development of identified CALFED programs.

Cost Information

No additional programs warranted expenditures other than normal SWP rates and charges (which were approximately $373 million in fiscal year 2005).

This fish ladder on Butte Creek allows protected fish like chinook salmon to reach spawning areas in its upper reaches. Projects that bolster these fisheries help sustain Metropolitan's SWP supply reliability.

Status of Resource Targets



Summary:

- Identified Storage and Transfer program components are expected to exceed IRP targets
- Additional programs or actions will be considered as needed to meet future demands (target buffer)

Central Valley Storage and Transfer Programs

Metropolitan's success in developing dry-year storage and transfer agreements is the result of changes since the IRP. These changes include:

- Active development of water storage and transfer program partnerships in the Central Valley;
- Recognition by some Central Valley agriculture interests that participation in transfer programs can be a good business practice;
- More cooperation between Metropolitan, DWR and the federal government in facilitating spot transfers and options;
- Recognition of the value of groundwater storage strategies.

Targets

The IRP Update set a target of 300,000 acre-feet dry-year supply for Central Valley transfer and storage programs.

Currently, 417,000 acre-feet of dry-year water has been developed for storage and Central Valley transfers.

Current Considerations and/or Changed Conditions

Delivery capabilities of these programs are closely tied to SWP supplies and operations. There are some concerns over the performance of some of these programs relating to potential lower SWP allocations in dry years mentioned in the previous section – in a single dry year, storage and transfer programs may need to provide more supplies than previously expected.

Implementation Strategies and Identified Programs

Programs with the following agencies are in operation:

- Semitropic Water Storage District
- Arvin-Edison Water Storage District
- San Bernardino Valley Municipal Water District
- Kern-Delta Water District
- Desert Water Agency/Coachella Valley Water Agency

Spot Transfers and Options

Metropolitan continues to pursue transfer agreements and relationships with entities in the Central Valley. While agreements thus far have been on a single-year basis, the additional capabilities provided by spot market transfers and options could provide 200,000 acre-feet or more in a given year. This flexibility will help ensure that Metropolitan meets the target for transfer supplies.

A major goal of the 1996 IRP was to develop additional supply reliability through the California Aqueduct by entering into flexible storage and transfer agreements with water users in the Central Valley. Metropolitan's strategy has been to focus on voluntary programs designed to improve regional reliability while benefiting those selling the water or providing storage. The target includes programs that bank Metropolitan's water supplies in storage, as well as water transfer programs.

Potential Transfer / Storage Programs

Metropolitan is investigating potential storage and transfer programs with a goal of developing an additional 125,000 acre-feet of dry-year supply capability. The programs under development include:

- Mojave Water Agency
- Kern Water Banking
- San Bernardino Valley MWD Conjunctive Use Program

Implementation Challenges

The primary implementation challenges for water transfers from north of the Delta include operational constraints to moving water through the Sacramento-San Joaquin Delta. The South Delta Improvement Program would allow Metropolitan to take full advantage of the storage programs being developed both inside and outside of Metropolitan's service area.

Other potential challenges may involve addressing political or social concerns relating to the transfers and their terms or amounts. For example, Metropolitan continues to be interested in pursuing multi-year transfer agreements, though some work remains to demonstrate the benefits to the local interests in areas where the transfers originate.

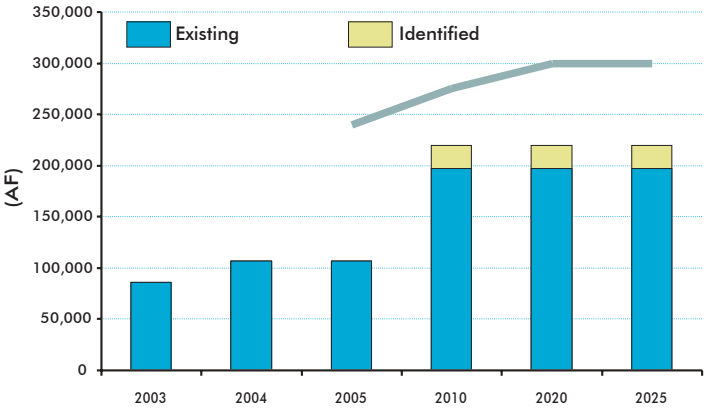
Cost Information

Nearly $31 million in various costs were incurred for FY 2005 Central Valley storage programs. About $1.125 million of this total was spent to secure water transfer options from willing sellers in the Central Valley. Due to abundant regional and statewide precipitation, Metropolitan did not call on those options. However, if all options were needed and called upon, additional costs for these transactions would have been about $14 million.

Water storage facilities at the Arvin-Edison Water Storage District

Status of Resource Targets

In-Region Groundwater Storage



Summary:

- Identified In-Region Groundwater Storage program components currently may not meet IRP targets
- Actions, such as an additional *Request for Proposals*, will be considered for implementation to meet IRP targets

In-Region Groundwater Storage

The In-Region Groundwater Storage target includes the dry-year yield from groundwater storage programs within the service area, and also includes estimates of yield from existing Cyclic Storage and the Replenishment Rate program.

Targets

The IRP Update set the following dry-year yield targets for in-region groundwater storage:

- 275,000 acre-feet for 2010;
- 300,000 acre-feet for 2020 and 2025.

Current Considerations and/or Changed Conditions

A review of the status of programs comprising the strategy for meeting the IRP targets for in-region groundwater storage identified that cyclic storage accounts have been retired earlier than previously anticipated, and therefore expected dry-year yields from this program should be reduced from 50,000 acre-feet per year for three years to 20,000 acre-feet per year.

Additionally, the proposed North Las Posas (NLP) Phase 3 has been deferred from an on-line date of 2010 to allow assessment of performance of the first two phases of the program. As a result, NLP is now planned to provide 47,000 acre-feet of dry-year-yield in 2010, reduced from 70,000 acre-feet. These two adjustments in the strategy for the 2010 target result in the need to develop an additional 55,000 acre-feet of dry-year yield to meet the 2010 target.

Currently, about 107,000 acre-feet of dry-year supply has been developed.

Implementation Strategies and Identified Programs

Cyclic Storage

As Metropolitan moves toward contractual conjunctive use agreements within the service area, older cyclic storage agreements (pre-delivery of long-term replenishment water) are replaced. Currently, Metropolitan has approximately 60,000 acre-feet of cyclic storage in the Main San Gabriel Basin. As a result, this component for meeting the IRP goals has been scaled back from 50,000 acre-feet to 20,000 acre-feet per year for three years.

Interruptible Long-term Replenishment Program

Due to record precipitation in the 2004-05 water year, Metropolitan has encouraged its member agencies to store additional water in the long-term replenishment program. Successes here confirm the future viability of the strategy to rely upon maintenance of groundwater

Groundwater basins within Metropolitan's service area can provide significant water storage and operational flexibility for Southern California. Conjunctive use storage in these groundwater basins is an important part of maintaining and enhancing the reliability of the region's future water supplies.

production for up to three consecutive years without provision of replenishment service. The in-region groundwater storage strategy has identified an average of 66,000 acre-feet per year for three years toward the IRP targets from this program.

Proposition 13 Projects

Metropolitan has utilized Proposition 13 funds to develop eight contractual groundwater storage programs to date. These agreements will provide a total of 197,000 acre-feet of storage with 64,000 acre-feet of dry-year-yield.

North Las Posas Groundwater Storage Program

Metropolitan has financed the construction of 18 aquifer storage and recovery wells in the NLP Basin pursuant to an agreement with the Calleguas Municipal Water District. These 18 wells comprise two phases of the program and will be on-line and fully operating prior to 2010. Calleguas MWD is completing the conveyance infrastructure to allow full operation of the wellfields. Over 48,000 acre-feet have been stored in this program to-date, largely through in-lieu means.

The anticipated Phase 3 of the program has been deferred pending operational experience over time with the constructed wellfields. As a result, capability for additional dry-year extraction above the current expected 47,000 acre-feet is now expressed in the IRP strategy as a potential future program.

Raymond Basin Conjunctive Use Program

The Foothill Conjunctive Use Program being developed under the Proposition 13 contractual programs is expected to begin providing dry-year yield of 3,000 acre-feet by 2010 in phase 1 of the Raymond Basin Program. Planning and analyses have progressed among Pasadena, Foothill MWD, Metropolitan and the Raymond Basin Management Board with a goal to provide an additional 22,000 acre-feet of dry-year yield.

Other Identified Programs

Metropolitan continues to discuss opportunities to expand groundwater conjunctive use storage programs throughout its service area. This year's supplemental storage program is one example: Metropolitan's water supplies are abundant from a wet winter across the state. To encourage storage in the region, Metropolitan is offering discount rates to its member agencies to store more water than previously planned. The water would be available at Metropolitan's call for up to six years. These and other potential programs will help to meet the groundwater storage IRP targets. Identified potential programs include:

- Chino Basin Storage Program Expansion
- Orange County Basin Storage Program Expansion
- North Las Posas Phase 3
- Central Basin Storage Program
- West Basin Storage Program
- San Fernando Basin Storage Program
- San Jacinto Basin Storage Program
- City of San Diego Storage Program

Implementation Challenges

Metropolitan staff will continue to develop and implement strategies, such as issuing a Request for Proposals, to meet the in-basin groundwater storage IRP goals. Preferred strategies will be brought before Metropolitan's Board for consideration as soon as possible after the release of this Report.

Cost Information

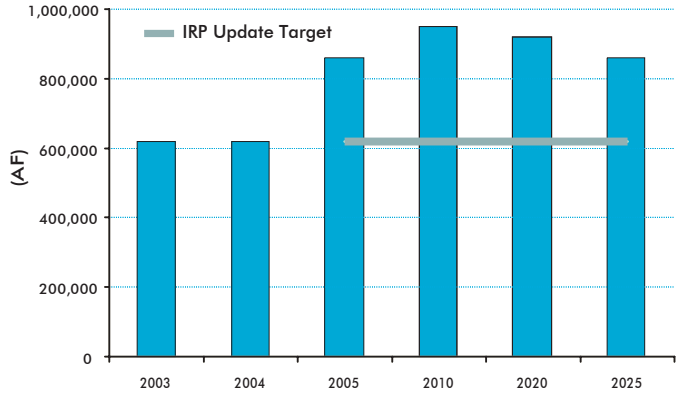
Funds that Metropolitan has already spent or allocated to develop groundwater conjunctive use programs include:

- $28.2 million for North Las Posas (phases 1 & 2);
- $66.8 million for Proposition 13 storage projects (includes $26.5 million Metropolitan capital, and $40.3 million from Prop. 13 grants).

One of the North Las Posas conjunctive use wells

Status of Resource Targets

In-Region Surface Water Storage



Summary:

- In-Region Surface Storage components are expected to exceed IRP targets
- Slight variances in dry-year yields are attributable to changes in demands and emergency storage requirements

In-Region Surface Water Storage

With the completion and filling of Diamond Valley Lake (DVL) and the flexible storage provisions of the SWP Monterey Amendment, Metropolitan has exceeded the in-region dry-year storage capacity identified in the 1996 IRP.

Targets

The 1996 IRP identified a 2020 in-region surface water target of 620,000 acre-feet of dry year storage – 400,000 acre-feet of dry year storage in DVL, and about 220,000 acre-feet available in the SWP terminal reservoirs (Castaic and Perris). This target remained the same for the IRP Update.

Current Considerations and/or Changed Conditions

Seismic concerns have arisen at DWR's Lake Perris Dam. In response, DWR plans to reduce the storage amount at Lake Perris by half until those concerns can be studied and addressed. Metropolitan's contractual position is that in the long-term, any reduction in storage cannot impact the flexible storage available to Metropolitan from the State Water Project.

Implementation Strategies and Identified Programs

Metropolitan has met or exceeded the 1996 IRP target for dry-year surface storage. Therefore no additional programs or strategies for in-region surface water storage at this time. Should a future IRP update require

A panoramic view of Diamond Valley Lake.

Metropolitan established general long-term storage guidelines in the 1999 Water Surplus and Drought Management (WSDM) Study. The WSDM plan provides for flexibility during dry years, allowing Metropolitan to use storage for managing water quality, hydrology, and supply variations.

Storage at DVL significantly improves Metropolitan's ability to manage wet/dry year hydrologic cycles of imported supplies. In combination with future completion of the Inland Feeder, DVL will allow Metropolitan to take full advantage of variable SWP supplies and to manage fluctuating Colorado River supplies.

changes to the target, existing surface water storage will be re-evaluated.

By 2025, Metropolitan will have approximately 650,000 acre-feet of dry year carryover storage capacity in DVL, Lake Mathews, and Lake Skinner, and 219,000 acre-feet of capacity in the SWP terminal reservoirs.

Local Production

In addition to local recycling and groundwater recovery, local groundwater and surface water production accounts for a significant portion of the region's total water supply. Naturally recharged groundwater resources in the region provide an average annual supply of 1.3 million acre-feet. Some of this supply is artificially recharged via surface spreading or injection of imported or recycled water supplies.

Local surface reservoir production (runoff from precipitation) provides about 10-15% of local supplies. While these non-LRP supplies can vary significantly year to year, they are generally assumed to increase slightly in the future.

Targets

There are no targets for local production, but there are estimates that were used in IRP analyses to help formulate the other resource targets.

Current Considerations and/or Changed Conditions

Information from Metropolitan's member agencies indicates a slight increasing trend for local production over time. It is anticipated that increasing use of recycled water to recharge groundwater basins and sustain seawater barriers will allow for increased groundwater production in the region. In 2006, a review of member agencies' 2005 Urban Water Management Plans will provide a more complete view of current and projected conditions.

CONCLUSIONS

While some change has occurred in all resource areas, this IRP Implementation Report acknowledges that Metropolitan still expects to maintain future supply reliability through its diversified water resources portfolio. Core supplies and existing programs are always susceptible to changing influences, and therefore all target components continue to be evaluated and refined. The IRP's adaptive planning framework, together with annual implementation reporting and a 5-year updating cycle, enables Metropolitan and its member agencies to continue to refine and revise the resource targets as new information and technologies become available.

Reliability

Considering all supply resources, the current programs and actions in place reinforce Metropolitan's expectation to continue to meet its target for delivering dry-year water supplies through 2025. When taken as an aggregate, available dry-year supplies slightly outweigh targets, maintaining 100% reliability for firm water demands.

Target Evaluation

All resources are susceptible to changes, and need constant monitoring and refinement. Most of the IRP targets are expected to be met, however there are some uncertain programs or actions that put that resource at greater risk of not meeting future targets.

Local Resources – Recycling, Groundwater Recovery and Desalination

Local resources programs currently meet the 2010 target based on current production and projects in development, and project to exceed both the 2020 and 2025 targets. This is anticipated from additional programs that are already planned to come on line after 2010.

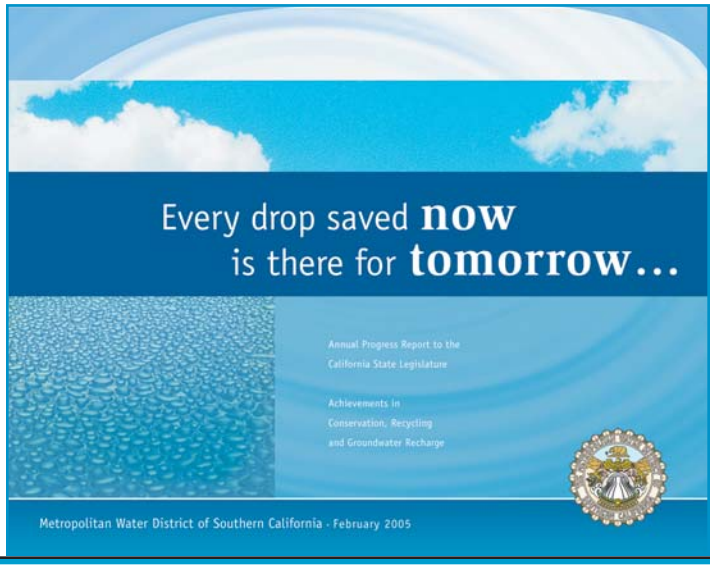
This resource target is associated with half of the supply buffer (or 250,000 acre-feet), and further programs will be identified, developed and implemented as needed and directed by Metropolitan's Board. Metropolitan's Board has decided to pursue the development of seawater desalination (through an incentive program), one of the components previously identified to help meet this supply target.

State Water Project

There are two significant, but not necessarily critical, issues affecting the SWP resource targets:

- DWR's Draft 2005 State Water Project Delivery Reliability Report, which indicated that the minimum SWP deliveries may be as low as 4-5 percent of the full Table A contract amount in the single driest year, and
- Increased SWP pumping capacity, while increasing transport capabilities for water transfers, would not provide additional Table A dry-year supplies.

Though significant, the dry-year shortfall for the SWP target is not considered the only critical factor, in part because on the average, supplies from the Delta are



Metropolitan's 2005 Annual Report on Achievements in Conservation, Water Recycling, and Groundwater Recovery

expected to provide storage opportunities. Though the SWP IRP targets are based on dry-year supply capabilities, these supplies are supplemented with the storage and transfer programs that Metropolitan has developed that use the SWP system.

In average and wet years, the anticipated increased SWP pumping capability becomes critically important for managing Metropolitan's SWP storage and transfer programs: by pumping water in wet years and banking that water south of the Delta, the need for dry-year supplies from the Delta is mitigated. Operating the system in this way provides significant flexibility for water supply managers and also environmental benefits. In dry years, the ability to move water supplies from transfer agreements through the Delta and/or the SWP system also is key to Metropolitan's dry-year supply strategy.

In-Basin Groundwater Storage

While minor changes in Metropolitan's cyclic storage and replenishment programs have occurred, the most significant changes for this resource target are due to delays in facilities construction, permitting, etc. in several of the conjunctive use programs. Staff continues to monitor progress of these programs, and will provide appropriate actions for the Board's consideration in the near future.