

# Developing New Water Options for Southern California

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## Policy Background and Introduction

Since its creation in 1927, The Metropolitan Water District of Southern California has focused on providing a reliable water supply to the people and economy of Southern California. Metropolitan's role in contributing to that broad mission has been shaped by a history of important principles and policies. In 1952, the Laguna Declaration positioned Metropolitan to "provide its service area with adequate supplies of water to meet expanding and increasing needs," and established Metropolitan's leadership role in "closing the gap" between the region's water needs and its locally available water supplies. In 1996, the Integrated Resources Plan (IRP) reliability goal stated that "Metropolitan and its member agencies will have the full capability to meet full-service demands at the retail level under all foreseeable hydrologic conditions" – establishing a balanced program of imported supplies and local resources development. Taken together, this growing body of policy has always been based on principle that Metropolitan will take a leadership role, working in collaboration with its member agencies, to assure that Southern California is provided with the water resources and necessary infrastructure required for meeting its needs and fulfilling its current mission to:

*"Provide its service area with adequate and reliable supplies of high-quality water to meet present and future needs in an environmentally and economically responsible way."*

Just as policy has evolved, so too has the technological and programmatic means by which the Metropolitan has accomplished that goal. Those tools include the region's largest water treatment facilities and transmission lines, the largest single contract with the State Water Project, emergency storage facilities and new water supply facilities to capture less predictable flows from the California Aqueduct, the development of regional conservation programs and leadership in demand side management, the creation of an innovative local resources program to provide support and incentives for the implementation of new and innovative water supply improvements within the service areas of its member agencies, as well as overall leadership in forecasting, analyzing, and providing for Southern California's current and future water needs.

## Short and Long Term Goals

Metropolitan strives for reliability in providing for regional demands while maintaining water quality and affordability. These goals have driven development of a flexible and diverse water resource portfolio to provide alternative supplies and adaptation in recognition of changing circumstances.

## Challenges

Metropolitan provides water to a broad and heterogeneous service area with water supplies from a variety of sources and geographic regions. Each of these demand areas and supplies has its own unique set of benefits and challenges<sup>1</sup>. The challenges posed by continued population growth, environmental constraints on the reliability of imported supplies, and the new uncertainties imposed by climate change demand that Metropolitan assert the same level of leadership and commitment to taking on large-scale regional solutions to providing water

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<sup>1</sup> Board Report (Integrated Water Resource Plan) Date of Report: July 1, 2009

## Developing New Water Options for Southern California

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reliability. New solutions are available in the form of dramatically improved water-use efficiency, indirect potable use of recycled water, and large-scale application of ocean desalinization.

Climate change adds its own new uncertainties to the planning challenge. Metropolitan's water supply planning has been fortunate in having almost 100 years of hydrological data regarding weather and water supply. This history of rainfall data has provided a sound foundation for forecasting the frequency and severity of future drought conditions, as well as the frequency and abundance of above-normal rainfall. As has already been experienced in Australia, weather patterns can be expected to shift dramatically and unpredictably in a climate driven by increased concentrations of carbon dioxide in the atmosphere. These changes in weather significantly affect water supply planning, irrespective of the debate associated with the sources and cause of increasing concentrations of greenhouse gasses.

Among the challenges Metropolitan faces are the following:

### Supplies

- The region and Colorado River Basin have been experiencing drought conditions for multiple years.
- Endangered species protections and conveyance needs in the Sacramento-San Joaquin River Delta System have resulted in operational constraints particularly important because pumping restrictions impact many water resource programs – State Water Project supplies and additional voluntary transfers, Central Valley storage and transfers, in-region groundwater storage and in-region surface water storage.
- Changing climate patterns are predicted to shift precipitation patterns and possibly affect water supply.
- Difficulty and implications of environmental review, documentation, and permitting for multi-year transfer agreements, recycled water projects and seawater desalination plants.
- Public perception of recycled water use for replenishment.

### Operations and Water Quality

- The cost and use of energy and greenhouse gas emissions.
- Water quality regulations and issues like the Quagga mussels within the Colorado River Aqueduct. Controlling the spread and impacts of the Quagga mussels will require more extensive maintenance and reduced operational flexibility.
- Salt and concentrate balance from variety of sources.

### Demand

- Uncertain population and economic growth
- Uncertain location of growth
- Uncertain housing stock and density

## Present Strategies: Integrated Resources Plan

As mentioned at the outset, Metropolitan has been employing an IRP<sup>2</sup> that addresses the complexity of this issue. It established targets for a diversified portfolio of investments, both structural and programmatic, that have provided the foundation for continued water supply reliability during a period of prolonged drought and severe regulatory limitations.

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<sup>2</sup> For more information about the IRP Process and a complete IRP Report, please refer to Metropolitan's website at <http://www.mwdh2o.com/mwdh2o/pages/yourwater/irp/index.html>

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## Developing New Water Options for Southern California

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The Plan establishes a long-term water resources strategy to fulfill Metropolitan's mission of providing high quality reliable water supply for its service area by identifying a range of potential resource development needs, supply alternatives, adaptation measures and program implementation blueprints. One of the fundamental findings of the IRP was that regional water supply reliability could be achieved through the implementation of a diverse portfolio of resource investments and conservation measures. The accomplishments achieved by both member agencies and Metropolitan have demonstrated the effectiveness of establishing clear responsibilities and a common road-map to the future. The portfolio developed in the 1996 IRP has served the region well for over nearly a decade-and-a-half.

### Background

#### 1996 IRP

Acknowledging the importance of water to the economic and social health of Southern California, Metropolitan has gradually shifted from an exclusive supplier of imported water to a regional water planner in collaboration with its member agencies. After the drought of 1987-1992, Metropolitan recognized the changed conditions and the need to develop a long-term water resources strategy to fulfill its mission of providing high quality reliable water supply for its service area. This process is now known as the IRP; the first IRP was adopted by Metropolitan in 1996. The IRP was guided by six objectives established by Metropolitan's Board early in the process:

1. Ensuring Reliability
2. Ensuring Affordability
3. Ensuring Water Quality
4. Maintaining Diversity
5. Ensuring Flexibility
6. Acknowledging Environmental and Institutional Constraints.

One of the fundamental outcomes of the IRP was that regional water supply reliability could be achieved through the implementation of a diverse portfolio of resource investments and conservation measures. The resulting IRP strategy is a balance between demand management and supply augmentation. For example, in its dry year profile, the resource framework counts on almost equal proportion of water conservation and recycled water as withdrawal from storage and water transfers. The IRP is also a balance between the use of local resources and imported supplies. In a dry year, about 55 percent of the region's water resources come from local resources and conservation. Additionally, through the IRP process Metropolitan found solutions that offer long-term reliability at the lowest possible cost to the region as a whole.

The 1996 IRP, as blueprint to resource program implementation, also established the "Preferred Resource Mix." Through extensive technical modeling the IRP workgroups and workshops developed a Preferred Resource Mix that would provide the Metropolitan region with reliable and affordable water supplies through 2020.

The IRP provides details on the Preferred Resource Mix and guidelines to established broad-resource target for each of the major supplies available to the region including:

1. Conservation
2. Local Resources - Water Recycling, Groundwater Recovery and Desalination
3. Colorado River Supplies and Transfers
4. State Water Project Improvement

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## Developing New Water Options for Southern California

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5. In-Region Surface Reservoir Storage
6. In-Region Groundwater Storage

### 2004 IRP Update

In 2004, the Metropolitan Board adopted an updated IRP. Various legislative issues concerning population growth and water supply called for further planning considerations of these changed conditions. This IRP Update had three objectives:

1. Review the goals and achievements of the 1996 IRP
2. Identify the changed conditions for water resource development
3. Update resource development targets through 2025

The 2004 IRP process fulfilled the new objectives and updated the long-term plan to account for new water planning legislation. The updated plan contained resource development targets through 2025, which reflected changed conditions; particularly increased conservation savings, planned increases in local supplies and uncertainties. The 2004 IRP also explicitly recognized the need to handle uncertainties inherent in any planning process. For the water industry, some of these uncertainties are the level of population and economy growth which directly drive water demands, water quality regulations, new chemicals found to be unhealthful, endangered species affecting sources of supplies, and periodic and new changes in climate and hydrology. As a result, a key component of the Updated Plan was the addition of a 10 percent planning buffer. The planning buffer provided for the identification of additional supplies, both imported and locally developed, that can be implemented to address uncertainty in future supplies and demands.

### Current Direction

#### Strategic Policy Review

As part of the IRP update process, Metropolitan's Board initiated a Strategic Policy Review. This Review examined the ramifications of alternative roles for Metropolitan, member agencies and local retail agencies in future development of water resources. The process explored three alternative policy cases:

1. Current approach - continuation of IRP policies and partnerships with member agencies
2. Imported focus - Metropolitan focuses on addressing Delta issues, imported supplies and water transfers and leaves local supply development entirely to member agencies
3. Enhanced Regional focus – Metropolitan examines new approaches, up to and including development and ownership for implementing large regional scale water recycling, groundwater recharge and seawater desalination

A study of water supply reliability and cost impacts associated with these approaches found that it is in the region's best interest for Metropolitan to continue to explore ways of increasing regional reliability and not limiting itself to singular areas like addressing Delta issues. The result of this process was a broader view of Metropolitan's role in comprehensive planning and implementation for regional reliability; adopting an adaptive resource development plan for the future may provide the most benefit for the region. This may mean Metropolitan adopts alternative roles, such as taking an enhanced role in supplies developed locally, in order to best adapt and respond to changing regional conditions and lay a solid foundation for future reliability.

## Developing New Water Options for Southern California

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### Furthering a Water Vision for Southern California

The IRP is currently being updated and extended into a broader water vision. A major component of this is to explicitly reflect uncertainty in Metropolitan’s future water management environment, evaluate a wider range of water management strategies, and seek a robust and adaptive plans that respond to uncertain conditions as they evolve over time and that ultimately will perform adequately under a wide range of future conditions. The potential impacts and risks associated with climate change, as well as other major uncertainties and vulnerabilities, will be incorporated in to the update and accounted for. A key evolution from the 2004 IRP will be the identification of vulnerabilities and contingency actions that will extend the concept of a Planning Buffer into tangible actions that will enable construction and implementation of contingency supplies if they are needed.

This update plans implementation targets and sets goals for the next 30 years through adaptive resource development, but it also helps define a more adaptive role for Metropolitan on a much longer timeline. Resource development uncertainties make setting targets more than 30 years in the future difficult, so Metropolitan is maintaining as adaptive an approach as possible. This includes not limiting its own role to one of water importer only or local supply funder only, but as importer, developer, funder or other alternative roles that are most appropriate for the changing conditions of the future.

<b>Resources Identified</b>
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Metropolitan has identified a variety of resources<sup>3</sup> with which to expand its portfolio. Below is a summary of those resources and Metropolitan’s involvement and implementation to date in each, as well as new initiatives and directions Metropolitan plans for the future.

	<b>Current</b>	<b>Future</b>
<b>Conservation</b>	Metropolitan and the member agencies sponsor numerous conservation programs in the region that involve research and development, incentives, and consumer behavior modification.	Develop new programs and innovative approaches like Conservation Banks and Developer Offsets. Pursue legislative and regulatory approaches to embed water savings into law.
<b>Local Resources</b> (Recycling & Groundwater Recovery)	Metropolitan offers financial incentives to local and member agencies through Local Resources Program (LRP) for recycled water and groundwater recovery.	Expand partnership approaches to include equity-sharing of new projects and Metropolitan development of large regional-scale projects.
<b>Seawater Desalination</b>	No seawater desalination programs.	Collaborate and invest in production of member agency developed drought-proof supply.
<b>Stormwater</b>	Metropolitan actively participates in regional planning and research efforts with local agencies to develop groundwater replenishment projects that use stormwater.	Facilitate regional interaction to develop pilot studies to identify new programs and approaches. Support integration of projects and develop partnerships.

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<sup>3</sup> Board Report (Integrated Water Resource Plan) Date of Report: July 1, 2009

## Developing New Water Options for Southern California

<b>Graywater</b>	No graywater programs.	Support pilot studies and research to develop programs, facilitate permitting and focus legislation.
<b>Central Valley Storage &amp; Transfers</b>	Central Valley storage programs consist of partnerships with Central Valley water districts to allow Metropolitan to store SWP in wetter years for return in drier years. Metropolitan's Central Valley transfer programs consist of partnerships with CVP and SWP settlement contractors to allow Metropolitan to purchase water in drier years.	Develop and maintain sustainable partnerships with long term coordinated management. Pursue innovative and flexible operations and agreements to allow for robust adaptation to future conditions.
<b>In-Region Groundwater Storage</b>	Cyclic storage programs, long-term replenishment storage programs, contractual conjunctive use programs.	Pursue collective management and replenishment studies; support and coordinate collaboration with recycled water and stormwater capture to optimize recharge opportunities.
<b>In-Region Surface Water Storage</b>	Metropolitan reservoirs (Diamond Valley Lake, Lake Mathews, Lake Skinner) and flexible storage in DWR reservoirs (Castaic Lake, Lake Perris).	No further programs planned.
<b>Colorado River Aqueduct</b>	Metropolitan holds a basic apportionment of Colorado River water and has priority for an additional amount depending on availability of surplus supplies. Also, basic apportionments are supplemented by water management programs.	Continue seeking long-term partnerships and innovative approaches including supporting agricultural efficiency and inter-state interactions.
<b>State Water Project</b>	Metropolitan receives water delivered under State Water Contract provisions, including Table A contract supplies, use of carryover storage in San Luis Reservoir, and Article 21 interruptible supplies.	Invest in long-term solutions for fixing the Bay-Delta ecosystem and operation while pursuing adaptive short-term measures. Seek flexible and coordinated opportunities.

The 1996 IRP and the IRP Update developed targets for a variety of these resources. The targets were set for years 2010, 2020 and 2025. The following provides a summary of each resource, the targets, the most recent progress in achieving the targets, and any changes in the resources.

### Conservation

Metropolitan's dedication to conservation since the early 1990's permitted the 1996 IRP to consider conservation a "core" water supply and establish targets for regional conservation savings. Establishing a conservation target required the use of a metric to measure conservation savings. However, conservation cannot be easily measured or metered. Models used in the 1996 IRP and the IRP Update estimated conservation savings based on expected changes in consumption from active and code-based conservation.

Metropolitan considers conservation from four different situations:

## Developing New Water Options for Southern California

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1. Active: savings from Metropolitan and member agency-funded conservation programs. These are also known as Best Management Practices (BMPs)
2. Code-based: savings from the Metropolitan-sponsored 1992 California plumbing code
3. Price Effects: savings due to increases in retail water rates and conservation rate structures enacted since 1990
4. Pre-1990: conservation from the 1980 California plumbing codes and price increases from 1980 to 1990.

As of the IRP update, Metropolitan did not assign a savings quantity to public awareness campaigns and education. It has been widely accepted that such programs prompt consumers to install water saving fixtures covered under active or code-based savings and thus are beneficial.

The 1996 IRP set the 2020 conservation targets to 882,000 acre-feet. The target set included projections of active BMP compliance and passive conservation. The IRP Update projected conservation savings of 1,028,000 acre-feet by the 2020 target. In addition the IRP Update provided a 2025 conservation forecast of 1,107,000 acre-feet. The table below shows the conservation targets for the 1996 IRP and Update.

Conservation Targets (AF)	2010	2020	2025
IRP Update Target	865,200	1,027,600	1,106,900
1996 IRP Target	738,000	882,000	N/A
Estimate	866,000	1,043,00	1,147,000

Given the revised conservation target, Metropolitan continued to support the member agencies in developing cost-effective BMP-guided conservation programs and devising new programs.

### Local Resources – Recycling, Groundwater Recovery, Seawater Desalination

The 1996 IRP Preferred Mix included a diverse portfolio of imported supplies and locally developed resources. Locally developed supplies aid the region as a whole by offsetting imported water demands, and making the net additional imported water available to the entire service area. The IRP targets for local resources included water recycling and groundwater recovery. Seawater desalination was included as a local resource in the 2004 IRP Update.

The IRP set targets and provided funding for the development of member agency wastewater recycling and groundwater recovery projects. To implement the 1996 IRP local resource targets, Metropolitan established the Local Resources Program (LRP). Through the LRP, member agencies are paid incentives for developing local resource projects. Beginning in 1998, projects for LRP funding are chosen through a competitive Request for Proposals (RFP). Metropolitan provides an incentive of up to \$250 per acre-foot. The goal of the RFP process is to reach the target of recycled water and groundwater recovery programs and take advantage of competitive matching funds from member agencies. In fiscal year 2007/08, about 114,000 acre-feet of recycled water was developed for non-potable uses and about 48,000 acre-feet of groundwater was recovered for municipal use.<sup>4</sup>

The 1996 IRP combined water recycling and groundwater recovery elements to establish a local resources production target of 410,000 acre-feet per year by 2010, and 500,000 acre-feet per year by 2020. The 2004 IRP Update set a year 2025 target for combined water recycling,

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<sup>4</sup> Metropolitan Water District of Southern California, *Annual Progress Report to the California State Legislature: Achievements in Conservation, Recycling and Groundwater Recharge*, February 2009. pp. 14

## Developing New Water Options for Southern California

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groundwater recovery, and seawater desalination elements that totaled 750,000 acre-feet per year (this included an increase of 250,000 acre-feet as a share of the supply buffer). By 2010 production of all local resources is expected to be 496,000 acre-feet, exceeding the 2010 IRP Update goal.

The local resources target is associated with half of the 2004 IRP Update's Planning Supply Buffer (or 250,000 acre-feet) and programs have been identified to fulfill the additional need. Imported water supplies from Central Valley/State Water Project storage and transfers make up the remaining half of the supply buffer.

Also included in the local resources under development are projects identified in 2008, Metropolitan prepared a Five-year Supply Plan to identify specific resource and conservation actions that would be implemented over the following five years to manage water deliveries under continued drought conditions and court ordered restriction. Beginning in April 2008, Metropolitan staff has worked with the member agencies through a series of meetings and workshops to develop and implement the Five-Year Supply Plan. The plan was initiated in response to a number of extraordinary events, such as regulatory actions that reduced water supplies from the State Water Project (SWP) to protect Delta smelt, as well as a record-dry hydrology.

The status and projections of locally planned recycling and groundwater recovery projects change from year to year. Metropolitan periodically surveys its member agencies to coordinate local supply projections.

Desalination was recognized as a potential local resource, but high cost estimates disallowed this resource from being included in the targets set for future development in the 1996 IRP. Later, advancement in membrane technology and improved plant locations reduced the cost of desalination. In 2001, Metropolitan issued a competitive RFP for seawater desalination projects for a total goal of 50,000 acre-feet. The overwhelming response to the RFP allowed Metropolitan to set a seawater desalination goal of 150,000 acre-feet in the 2004 IRP Update. The desalination was combined with recycled water and groundwater recovery under the local resources targets.

In April 2007, Metropolitan's Board adopted updated administrative policy principles for LRP implementation. The new principles allow for an open process to accept and review project applications submitted on a continuous basis, with a goal of the development of an additional 174,000 acre-feet per year of local water resources. The new process is intended to accelerate LRP project development.

### **Potential Resource: Stormwater/Urban Runoff**

Metropolitan is assessing the feasibility of incorporating stormwater/urban runoff as a resource in the 2009 IRP Update. It was not identified as a water supply component in the 1996 IRP or the 2004 IRP Update.

Through work in 2009 of the IRP Technical Workgroup for Stormwater/Urban Runoff, Metropolitan staff compiled information to identify opportunities, determine an approach to calculate yield, and recommend regional strategies for implementation. In its 2007 Groundwater Assessment Study, Metropolitan identified more than 3.2 million acre-feet of storage space within the Metropolitan service area. Results from the Groundwater Augmentation Model (GWAM),<sup>5</sup> along with extrapolated data for areas outside of Los Angeles County, indicated that

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<sup>5</sup> The GWAM was developed by the U.S. Bureau of Reclamation and the Los Angeles & San Gabriel Rivers Watershed Council for use in the Los Angeles Basin Water Augmentation Study.

## Developing New Water Options for Southern California

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there is an estimated annual average of 1 million acre-feet of stormwater runoff currently generated from the valley floors alone within the Metropolitan service area.<sup>6</sup> An annual average of 1 million acre-feet of urban runoff is generated within the Metropolitan's service area. About 477,000 acre-feet per year of stormwater runoff is currently captured in spreading basins or other facilities for groundwater recharge.

### **Program Development**

The IRP Technical Workgroup for Stormwater/Urban Runoff identified 30 stormwater projects and programs that are anticipated for completion between 2009 and 2020. By 2020, these projects could collectively increase regional stormwater capture by about 45,200 acre-feet per year.

### **Potential Resource: Graywater**

Graywater was not identified as a water supply component in the 2004 IRP Update. Program potentials have been examined through the IRP Technical Workgroup for Graywater based on stakeholder comments and the IRP Technical Oversight Committee's direction.

### **Program Development**

Metropolitan and its member agencies currently do not offer incentive programs for graywater use. The IRP Technical Workgroup for Graywater recommended that Metropolitan should not take an active role in providing financial incentives at this time due to high costs, lack of data, and uncertainty in the regulatory environment. Further research and development is needed.

### **Central Valley Storage and Transfers**

The 1996 IRP established a major goal of increasing the reliability of supplies received from the California Aqueduct by developing flexible Central Valley storage and transfer programs. Since adopting the 1996 IRP, Metropolitan has developed numerous voluntary Central Valley storage and transfer programs. Both the 1996 IRP and the 2004 IRP Update established a dry-year water resource development target of 300,000 acre-feet by 2010.

### **Program Development**

2010 supplies are projected to be between 242,000 and 679,000 acre-feet, under existing agreements.

### **Colorado River Aqueduct**

A contract with the federal government provides a basic apportionment of 500,000 acre-feet per year of Colorado River water. Historically, Metropolitan has also held priority for an additional 662,000 acre-feet per year, depending on availability of surplus supplies.

The IRP target for Colorado River supplies includes Metropolitan's basic apportionment and supplies from storage and transfer programs that combine to provide the Colorado River Aqueduct (CRA) capacity. The IRP update set the total CRA dry-year deliveries to 879,000 acre-feet in 2010 and 1,250,000 in both 2020 and 2025.

To fulfill the long-term targets, Metropolitan will produce 1,250,000 acre-feet of supply when needed. The Qualification Settlement Agreement between California Agencies, which established the baseline water use for each agency, provides a foundation for these supplies. Also, Metropolitan has identified five programs to fulfill the resource needs. The programs are:

1. IID/San Diego County Water Authority Transfer

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<sup>6</sup> The GWAM is programmed with coverage of urbanized areas, and does not include runoff results from non-urban (e.g., mountainous) areas within each watershed.

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## Developing New Water Options for Southern California

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2. Coachella and All-American Canal Lining programs
3. IID/MWD Conservation program
4. Palo Verde Irrigation District program
5. Lake Mead storage

In 2007, Quagga mussels (relatives of the zebra mussels overrunning the Great Lakes and Mississippi River watersheds) were found at various locations within Metropolitan's CRA. If left unchecked, Quagga mussels can destroy water supply systems. Controlling the spread and impacts of the Quagga mussels will require more extensive maintenance and operational changes along the CRA system to accommodate new treatment and maintenance needs.

### State Water Project

Metropolitan currently holds a 1,911,000 acre-feet contract for annual deliveries from the Bay-Delta. However, water quality and supply reliability challenges due to variable hydrology and environmental standards limit the amount of the contract that can be fulfilled from year to year.

Originally the IRP set targets for the SWP through 2025. However, subsequent Board policy on Bay-Delta improvements removed specific targets and instead focused on improvements to ecosystem, water quality, and supply reliability.

### In-Region Surface Water Storage

Facilities that are considered in this resource are:

- Metropolitan Reservoirs (Diamond Valley Lake, Lake Mathews, Lake Skinner)
- Flexible Storage in DWR reservoirs (Castaic Lake, Lake Perris)

The approach used in the IRP Update assumes dry-year surface storage can be used as needed and as available within the Water Surplus and Drought Management (WSDM) planning framework. The WSDM, established in 1999, guides Metropolitan's operations of its storage and water management actions in both wet and dry years. The 1996 IRP and IRP Update identified an in-region surface water target of 620,000 acre-feet of dry-year storage (400,000 acre-feet in DVL and 220,000 available through the Monterey Amendment) for each of the years 2010, 2020 and 2025.

### In-Region Groundwater Storage

Groundwater basins within Metropolitan's service area provide operational flexibility to the water supply in Southern California. Since the 1950s conjunctive use has been used for local water management. Now, more than 70 recharge facilities are replenishing groundwater basins throughout Southern California.

Targets for conjunctive use, also known as groundwater storage, have taken into consideration an effective ratio of groundwater storage to delivery capacity of three to one. This ratio generally allows for maximum storage under historical hydrologic variations, while minimizing costs.

The 1996 IRP set the targets for dry-year yield of 275,000 acre-feet in 2010 and 300,000 acre-feet in 2020. The IRP update left the 2010 and 2020 targets unchanged and added the 2025 target of 300,000 acre-feet. These In-Region Groundwater Storage targets include the dry-year yield from groundwater storage programs within the region, existing Cyclic Storage and the Replenishment Rate program.

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## Developing New Water Options for Southern California

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As of July 2007, in-Region Groundwater Storage is not expected to meet the 2010 target. Building on information in the Groundwater Assessment Study, which was completed in 2007, Metropolitan has planned a groundwater workshop process with member agencies and groundwater basin managers to develop strategies and recommendations to increase groundwater conjunctive use.

### Business Functions and Processes

1. The IRP process is a region-wide collaborative effort involving many groups including Metropolitan, member agencies, subagencies, groundwater basin managers and representatives from environmental, agricultural, business and civic communities. The involvement of all stakeholder groups is critical to creating a successful reliability plan and takes place through a series of stakeholder and public forums.
2. The IRP also involves technical workgroups made up of member agency and retail agency staff, other non-governmental organizations, and staff from wastewater and stormwater management agencies as necessary, Metropolitan staff and consultants. These workgroups meet on an as-needed basis throughout the IRP Update process.
3. To provide more direct involvement of the Metropolitan Board of Director's in the IRP process, Chairman Timothy Brick created a special committee, the IRP Steering Committee, which consists of five Metropolitan Directors. This IRP Steering Committee's purpose is to:
  - a. Meet on a regular basis to receive information and briefings from Metropolitan staff
  - b. Develop and recommend policy options to the Water Planning and Stewardship Committee and to the full Metropolitan Board of Directors
  - c. Review proposed planning approaches, resource strategies, and recommendations from Metropolitan staff and the Technical Oversight Committee
  - d. Provide a public forum to receive input from stakeholders, including the public, on issues and concerns pertaining to the IRP Update
  - e. Prepare material for the Board Workshops, where proposed process is presented and policy direction is discussed
4. An annual IRP Implementation Report serves as a "report card" keeping the Metropolitan Board and its member agencies apprised of the current status of the resources and their progress towards the targeted goals.
5. The IRP is updated as part of the normal five-year planning cycle. The IRP was first adopted in 1996, updated in 2004 and currently undergoing a second update in response to changing conditions.
6. The status and projections of locally planned recycling and groundwater recovery projects change from year to year. Metropolitan periodically surveys its member agencies to coordinate local supply projections.

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## Developing New Water Options for Southern California

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### Conclusion

Water supply planning is an ever changing process. Several changed conditions were observed from the 1996 IRP to the 2004 Update. As a result, the 2004 IRP changed or updated IRP targets in all six of the Preferred Resource Mix resources. Now, four years since the last IRP update there is a need for a new round of water resource analysis and projections. Recent events have called Metropolitan's attention to new and changing trends in the region's water supply reliability. Changes in the trends of climate, the cost and use of energy, endangered species protections, greenhouse emissions and conveyance needs in the Sacramento-San Joaquin River Delta System have already been observed. These future variations call for updated planning and for the fortification of adaptive strategies to confront additional challenges in future. These strategies include not only resource development plans, but also adaptation of the role Metropolitan plays in that regional resource development in order to best provide for the region as a whole.

Metropolitan will adapt by fully accepting the challenges and uncertainties of what is ahead. There is no doubt that the technologies can and will be available to support continued population and economic growth. The challenge is to be sure that the right technology is implemented where and when it is needed. Metropolitan prepares for this by identifying the "low-risk no regret" actions that Metropolitan can take in order to swiftly respond to the uncertainties of both implementation timing and climate change. It proposes an action plan that is driven by affordability and adaptability. Pay no more than is necessary to provide reliable water supply. Pay no less than is necessary to ensure the water supply and facilities are in place on the day they are needed. It is a difficult balance to accomplish and maintain. It can be achieved. Sufficient, safe, reliable, and affordable water is the outcome it delivers.