THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

INFORMATION

- **Board of Directors**
  Water Planning and Stewardship Committee

November 10, 2009 Board Meeting

9-3

Subject

Water Surplus and Drought Management Plan Overview

Description

The Water Surplus and Drought Management (WSDM) Plan was adopted in April 1999 by the Metropolitan Board of Directors. The WSDM Plan provides the overall strategy for managing Metropolitan's resources to meet the range of estimated demands for a calendar year. At the beginning of each year, Metropolitan faces a wide range of possible supply and demand conditions. The WSDM Plan provides a strategy for the upcoming year to manage Metropolitan's resources to meet that range of possible hydrologic conditions, from wetter surplus conditions to drier shortage conditions. The purpose of this letter is to provide a summary of the WSDM Plan's principles and implementation goals, and to provide historical examples of the WSDM Plan's use and performance. The WSDM plan can be found on Metropolitan's Web site through the following link:
http://www.mwdh2o.com/mwdh2o/pages/yourwater/WSDM_Report1150.pdf

Executive Summary

Purpose of the WSDM Plan

The WSDM Plan was developed as a water management strategy that addresses resource actions executed in both surplus and shortage conditions. The Guiding Principle of the WSDM Plan is:

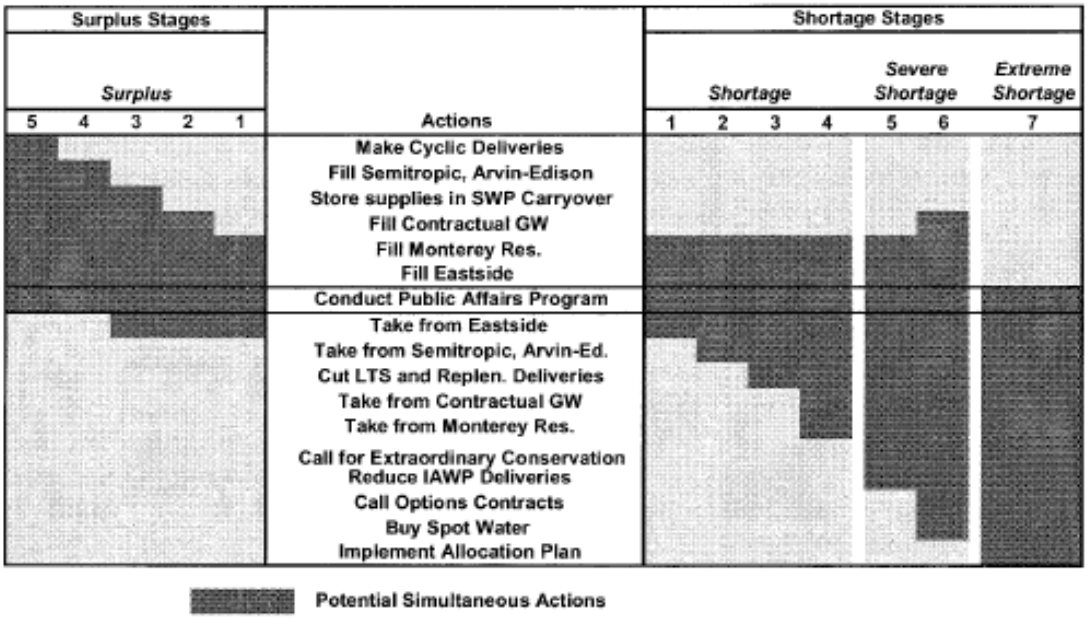
Metropolitan will aggressively store water during periods of surplus and work jointly with Member Agencies to minimize the impacts of water shortages on the regional retail consumers and economy during periods of shortage.

The WSDM Plan Implementation Goals are:

1. Avoid mandatory imported water allocations to the extent practicable
2. Equitably allocate water on the basis of agencies' needs
3. Store surplus supplies to mitigate shortages and improve water quality

These Implementation Goals outline the fundamental policies for dealing with surplus and shortages in an equitable and efficient manner within a calendar year. Through analysis of supplies and demands, the degree of surplus or shortage for various times throughout the calendar year is estimated, and different actions under the WSDM Plan for each surplus or storage stage are considered for implementation. The following Figure 1 "Resource Stages and Actions Matrix", provides a graphical representation of the WSDM actions to be taken under each stage. This matrix is commonly, yet erroneously, referred to as the stairstep of prioritized actions that must be taken in a specified order during conditions of surplus and shortage. The intended purpose is to provide a framework of preferred actions and considerations that fulfill the primary implementation strategy inherent in the WSDM Plan, which is to manage Metropolitan's storage resources in a way that minimizes risk and maximizes the use of those resources.

Figure 1: Resource Stages and Actions Matrix



Implementation Strategies

Storage

The primary implementation strategy for managing Metropolitan's storage resources centers on prioritizing storage inside Metropolitan's service area and, where possible, in surface reservoir facilities over groundwater storage. The definition of areas and programs, and the rationale for prioritization is as follows:

1. Inside vs. Outside Service Area
    a. Inside Service Area – storage programs within the region are the first priority for Metropolitan because these programs are usually under the control of Metropolitan or its member agencies and thus have less performance risk.
    b. Outside Service Area – the storage of Colorado River and State Water Project supplies outside the region are considered second priority for Metropolitan because of increased performance risk from proximity and because the facilities of these programs are usually under contract with third parties as opposed to under Metropolitan's direct control.
2. Surface vs. Groundwater Storage
    a. Surface Storage – surface storage generally has priority over groundwater storage programs because of the greater withdrawal capacity, which maximizes the availability of stored water during times of need.
    b. Groundwater Storage – this important resource is considered a second priority because these types of programs generally have some pumping capacity constraints, coupled with the fact that such water can usually only be used by the overlying member agency or local agency. In addition, spreading or injection can only be done during certain conditions.

Other Actions

The implementation strategy for non-storage actions during shortages are prioritized with the intent of taking prudent actions that complement storage priorities. As the intensity and stages of shortage increase, discounted water sales to groundwater replenishment demands are interrupted concurrent with withdrawals from groundwater conjunctive use programs. Interim Agricultural Water Program deliveries are reduced concurrent with increased

advertising and calls for extraordinary conservation on the part of the consumers. If shortage stages are projected to be severe enough to justify the higher price of water transfers, purchases of transfer water supplies and calling of option-based transfers are executed. Finally, if shortages cannot be managed through a combination of storage and water management actions, the water supply allocation plan is implemented.

Detailed Report

Background and Development of the WSDM Plan

Metropolitan and its member agencies developed the WSDM Plan in 1998 as a continuing part of the 1996 Integrated Water Resources Plan (IRP) implementation. The WSDM Plan provides a fundamental framework for Metropolitan's resource operations to attain the region's reliability goals. The overall goal of the Plan is to ensure that shortage allocation of Metropolitan's imported water supplies is rarely used under all historical hydrologic and regulatory conditions. The WSDM Plan defines the terms surplus, shortage, severe shortage and extreme shortage and provides actions that can be taken at each phase.

Surplus: Supplies are sufficient to allow Metropolitan to meet Full Service demands, make deliveries to all interruptible programs (replenishment, long-term seasonal storage, and agricultural deliveries), and deliver water to regional storage programs.

Shortage: Supplies are sufficient to allow Metropolitan to meet Full Service demands and make partial or full deliveries to interruptible programs, sometimes using stored and voluntary water transfers.

Severe Shortage: Supplies are insufficient and Metropolitan is required to make withdrawals from storage, call on its water transfers, and possibly call for extraordinary drought conservation and reduce deliveries under the Interim Agricultural Water Program.

Extreme Shortage: Supplies are insufficient and Metropolitan is required to allocate available imported supplies.

WSDM Principles and Implementation Goals

The WSDM Plan was developed through a participatory process with Metropolitan and the Member Agencies. "WSDM Principles and Implementation Goals" were set through a series of meetings of the Rate Refinement Team and the IRP Workgroup, both made up of Metropolitan staff and Member Agency representatives.

Guiding Principle

Metropolitan will aggressively store of water during periods of surplus and work jointly with Member Agencies to minimize the impacts of water shortages on the regional retail consumers and economy during periods of shortage.

Supporting Principles

1. Maintain an ongoing coordinated effort among Metropolitan and its Member Agencies to encourage efficient water use and cost-effective local resource programs and to inform the public on water supply and reliability issues
2. Encourage local and regional storage during periods of surplus and use of storage during periods of shortage
3. Manage and operate Metropolitan's regional storage and delivery systems in coordination with local facilities to capture and store surplus water in local groundwater and surface reservoirs
4. Arrange for secure sources of additional water from outside the region for use during periods of shortage
5. Call upon sources of additional water from outside the region and water stored locally to meet the needs of consumers and protect the economy during periods of shortage

Implementation Goals

1. Avoid mandatory imported water allocation to the extent practicable
2. Equitably allocate imported water on the basis of agencies' needs

Considerations to create an equitable allocation of imported water may include:

a. Impact on retail consumers and economy

b. Recycling

c. Conservation

d. Population and economic growth

e. Investment in local resources

f. Change and/or loss of local supply

g. Participation in Metropolitan's Non-firm (interruptible) programs

h. Investment in Metropolitan's facilities

3. Store surplus supplies to mitigate shortages and improve water quality

Surplus Actions

Metropolitan's surface storage facilities, such as Lake Mathews, Lake Skinner, and Diamond Valley Lake and the storage capacity available in Castaic Lake and Lake Perris allow for flexibility in managing water resources. In addition to these surface storage facilities, Metropolitan has developed groundwater storage programs, also known as conjunctive use storage, to manage water resources in time of surplus. These groundwater storage programs are separate from groundwater replenishment program water that is sold at discounted water rates, as replenishment is accounted for as a demand on Metropolitan and not considered by the WSDM Plan as storage. In general, the storage priorities under which surplus water is stored are as follows:

1. Inside vs. Outside Service Area

   a. Inside Service Area – programs within the region such as Diamond Valley Lake, Lake Mathews and Lake Skinner are the first priority for Metropolitan to store surplus supplies.

   b. Outside Service Area – the storage of Colorado River and State Water Project supplies outside the region are considered second priority for Metropolitan since the accessibility to out of service area storage may be affected by external factors.

2. Surface vs. Groundwater Storage

   a. Surface Storage – these types of storage programs have priority over groundwater storage programs because they maximize the availability of imported water during times of need since surface water has greater store and take capacity.

   b. Groundwater Storage – the fact that such water can usually only be used through pumping by an overlying member agency or local agency, spreading can only be done during certain conditions and the frequent maintenance of spreading basins makes groundwater storage a second priority for surplus storage.

Considering the factors delineated above, the general order of storage management is as follows:

1. Inside Service Area Surface Storage
2. Inside Service Area Groundwater Storage
3. Outside Service Area Surface Storage
4. Outside Service Area Groundwater Storage

This storage strategy tends to maximize storage inside the service area, increase withdrawal reliability, and strategically stores water throughout Metropolitan geographic region.

Shortage Actions

The goal of the shortage actions is to avoid, to the extent practicable, the allocation of Metropolitan's firm supplies. Varying factors throughout a calendar year may necessitate a different order of actions, or several actions to be taken simultaneously. In general shortage actions are taken in the following order:

1. Withdraw a small amount of reserves from Diamond Valley Lake to maximize supply flexibility and to reduce overall cost in smaller shortage stages.
2. Outside Service Area groundwater and surface, since these supplies are more vulnerable than in-basin-storage
3. Interrupt deliveries to groundwater replenishment programs
4. Use inside Service Area Groundwater
5. Draw on inside Service Area Surface water under the DWR Flexible Storage Accounts
6. Interrupt deliveries to Interim Agricultural Water Program and call for Extraordinary Conservation
7. Call on Option Transfer programs and supplement supplies through available Spot Transfer purchases

With regard to the storage resources, this order of preference in operations essentially continues the goals under which water was stored. Storage tends to be maintained or reserved inside the service area, and withdrawn sooner from programs that have slower withdrawal capability.

Analysis

Throughout the Integrated Resources Planning process and the development of the WSDM Plan, extensive analysis of resource management strategies focused on maximizing supply reliability while minimizing overall resource costs. Various management strategies were analyzed under shortage scenarios based on historical hydrologic and regulatory data. The WSDM Plan presents a resource management framework to guide Metropolitan's integrated approach to supply management.

The resource management framework does not dictate a scripted response to shortage or surplus. The framework recognizes the complexity and variety of conditions that require action. Supporting this framework are general rules that describe the actions to be taken in each stage of surplus or shortage. These rules depend on shortage stage, account for monthly delivery requirements, and depend on when various supplies would be available.

One of the fundamental trade-offs in dealing with supply shortages is the need to maintain flexibility while providing supply certainty to member agencies and consumers. A central focus of the WSDM Plan is the analysis of information about supplies and demands.

Historical Example of Shortage Actions

Conditions and actions in Calendar Years 2007 through 2009 provide a historical example of how increasing shortage led to implementation decisions that were generally guided by the WSDM Plan resource management framework. The example also highlights that the WSDM Plan does not provide a strict prioritization or ordering of actions in time. Rather, the framework allows for actions to be taken in anticipation of continued or deeper shortage conditions. By mid-2007, dry hydrologic conditions had already led Metropolitan to begin withdrawing water from groundwater banking programs outside the service area and from some storage inside the service area.

At that time, the region was faced with the additional threat of ongoing and future water supply challenges resulting from regulatory restrictions on the operations of the SWP to protect Delta smelt and potentially other threatened or endangered species in the Delta. Because of the additional shortage that these conditions could bring, Metropolitan then initiated a series of actions including the interruption of discounted Replenishment Program water and the ramping up of advertising through the "It's Time to Get Serious" outreach effort. The outlook for shortage conditions continued into 2008. In addition to continuing withdrawals from Metropolitan storage programs, shortage conditions also led to the interruption of sales under the Interim Agricultural Water Program. The heightening of advertising continued with the creation of Metropolitan's Water Supply Condition

System and the declaration of a "Condition 2-Water Supply Alert". This was essentially a call for extraordinary conservation, and was augmented by stepped-up water efficiency programs like the $15 Million Public Sector Program. With no relief in sight in 2009, Metropolitan continued the shortage actions that had been started in the previous two years and increased its efforts to secure additional water transfer supplies through the State Water Bank. In April 2009, conditions had not improved and the Board approved the implementation of the Water Supply Allocation Plan.

Summary of Performance

For the ten-year period from 1999-2008, that the WSDM Plan was designed for, shortages were managed by withdrawals from storage, groundwater management and options transfers. The quantity of water delivered to the member agencies for consumptive uses was not impacted during the ten-year period. The plan also aided the Metropolitan Board in the decision to build Diamond Valley Lake as a way to counteract shortage from the Colorado River Aqueduct. Additionally, the WSDM Plan includes guidance that was useful recently, as it specifies how to manage extreme shortages, such as the one faced in 2009. The Plan states "Under this worse-case scenario, an approach to allocate Metropolitan's firm imported water supplies in a fair and equitable manner will be developed". There foundational principles, based on thorough analysis and strategic actions, make the WSDM Plan an important policy approach and water year planning mechanism for managing Metropolitan's water supply resources.

Policy

By Minute Item 43189, dated September 15, 1998, the Board approved the Water Surplus and Drought Management (WSDM) Plan Principles as guidelines for development of the WSDM Plan.

Fiscal Impact

None

10/27/2009
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