



● Report on Storage Management Strategy and Implementation

Summary

This informational letter describes operating principles and processes that currently guide the management of regional storage under varied hydrologic conditions. The operating principles are based on Board-approved policies established in the Water Surplus and Drought Management (WSDM) Plan and the Water Supply Allocation Plan (WSAP).

The WSDM Plan provides policy guidance for managing storage during periods of surplus and shortage. This plan, adopted by the Board in 1999, provides a framework to achieve the Integrated Water Resources Plan (IRP) reliability goals. The WSDM Plan provides a flexible framework used in conjunction with other important considerations that influence storage management decisions, including operational and water quality considerations, contractual requirements for storage programs, and system reliability through the coordinated use of the multiple groundwater and surface reservoir resources in the storage portfolio. The primary implementation strategy inherent in the WSDM Plan is to manage Metropolitan's storage resources in a way that manages risk while maximizing the prudent use of those resources.

Effective management of Metropolitan's storage portfolio is not only important in achieving Metropolitan's water supply reliability but critical in decision making for other drought actions and reporting requirements. The reporting requirements under California's newly adopted Water Shortage Contingency Plan (WSCP), for example, hinges on dry-year storage conditions as they are tracked through the year. In addition, decisions to implement the WSAP are guided by projected declining dry-year storage levels.

Purpose

Informational

Attachments

Attachment 1: Total Storage Capacity

Detailed Report

Background

Metropolitan manages regional storage according to the board-approved policies established in the WSDM Plan and to meet operational needs. Currently, Metropolitan manages more than 20 individual storage accounts and resources. These storage accounts include groundwater and surface storage programs and facilities, both inside and outside of Metropolitan's service area, such as Diamond Valley Lake (DVL), Flexible Storage in Castaic Lake and Lake Perris, Intentionally Created Surplus (ICS) storage in Lake Mead, in-basin groundwater Conjunctive Use Programs, and groundwater storage in the Central Valley. Storage capacities for each storage program are shown in Attachment 1.

Guiding Principle for Managing Regional Storage

The Board adopted the WSDM Plan in 1999 to establish policy guidance for managing storage, water supplies, and water programs in periods of surplus and shortage. The WSDM Plan recognizes the link between surpluses and shortages, and it integrates planned operational actions for both conditions. The guiding principle of the WSDM Plan is to manage Metropolitan's water resource programs to maximize the benefit of wet year supplies and minimize adverse impacts of water shortages to retail customers.

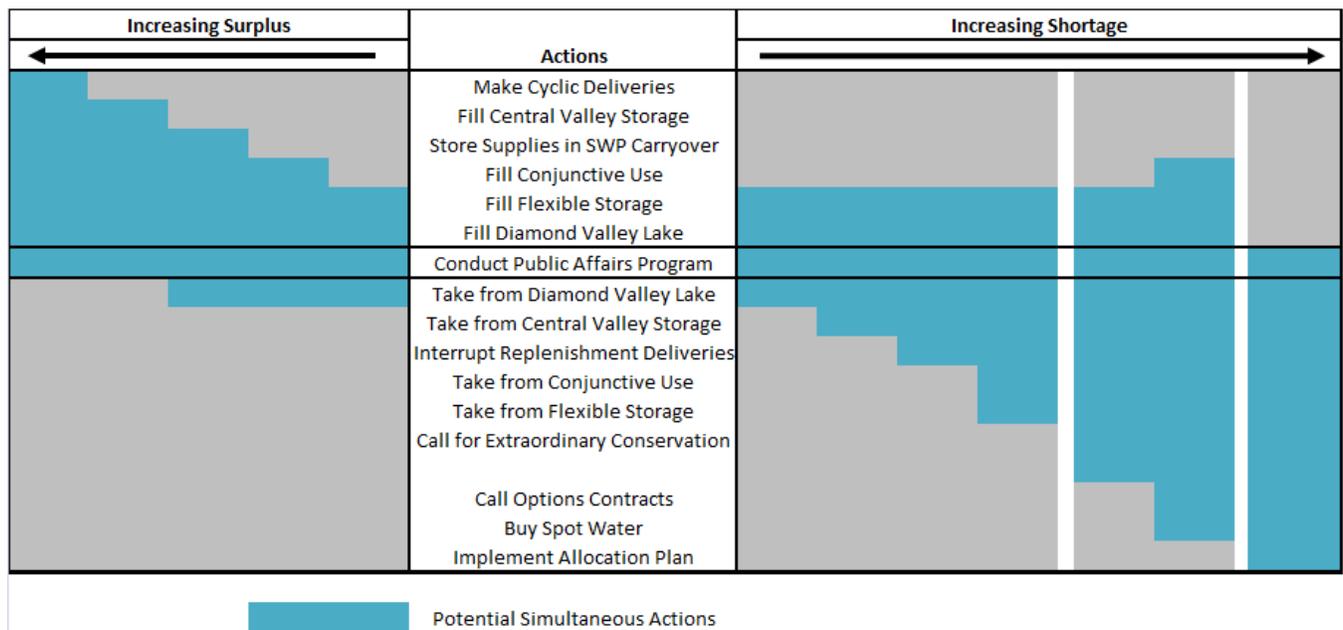
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The WSDM Plan Implementation Goals are:

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

These implementation goals outline the fundamental policies for dealing with surplus and shortage equitably and efficiently 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 surplus or shortage are considered for implementation. Also considered are the impacts to Metropolitan's ability to achieve its storage goals in the future based on actions taken in the current year.

The figure below, adapted from the 1999 WSDM Plan, graphically represents the types of actions taken as surplus or shortage conditions appear (note that the specific actions are added and deleted over time). This matrix is commonly, yet erroneously, referred to as a stair-step of prioritized actions that must be taken in a specified order during conditions of surplus and shortage. Instead, the graphic provides a framework of generally-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.



Since the introduction of the WSDM Plan, Metropolitan's storage has been managed to meet the region's needs during critical droughts. Additionally, Metropolitan has continued to increase its storage potential to further diversify its options and provide enhanced operations and resource management. Metropolitan's current dry-year storage portfolio can store more than five million acre-feet using a variety of methods.

The WSDM Plan principles for drawing upon storage provided flexibility to increase dry-year reliability with a portfolio of storage options, even during the 2008-2009 and 2012-2016 droughts. The plan also acknowledges that other important factors influence the management of Metropolitan's storage portfolio. An excerpt from the WSDM Plan states:

“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.”

The WSDM Plan, therefore, guides managing regional water supplies to achieve the reliability goals of the IRP and identifies the expected sequence of resource management actions that Metropolitan will execute during surpluses and shortages to minimize the probability of severe shortages and allocations.

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Operating Principles for Managing Regional Storage

The operating principles that guide the management of regional storage are based on the board-approved policies established in the WSDM Plan. One of the fundamental trade-offs in dealing with potential supply shortages is the need to maintain operational flexibility to meet the member agencies' critical system and demand requirements. The operating principles include:

- **Operational Flexibility**: Storage programs and facilities are managed as an integrated set of regional resources, not by individual storage accounts. The availability and quality of water deliveries on the State Water Project (SWP) and Colorado River Aqueduct (CRA) vary depending on hydrology, regulatory constraints, and system operations. In addition, year-over-year water demands on Metropolitan have fluctuated up to 30 percent since the adoption of the WSDM Plan. To manage changing conditions, operational flexibility to coordinate the withdrawal and filling of storage between various reservoir and groundwater programs must be maintained. Prescriptive triggers on water resource actions from individual programs, accounts, and facilities would run counter to maintain flexibility for on-the-ground conditions.
- **System Reliability**: Storage is managed to meet the demands of the entire service area, including areas highly dependent on either SWP or CRA supplies. For example, there are portions of Metropolitan's service area that can only be served with Metropolitan's SWP deliveries. These exclusive SWP areas are located in Ventura, Los Angeles, Riverside, and San Bernardino Counties.
- **Invasive Species Protection**: Regional storage will be managed to minimize the risk of infestation or transmission of invasive species. The Colorado River system has been infested with quagga mussels since 2007, while the SWP system remains free of this invasive species. As a result, the current objective is for DVL to be filled exclusively with SWP supplies and receive no Colorado River deliveries. The flexible WSDM Plan allowed adjustments to the priority for filling DVL with Colorado River water as a result.
- **Water Quality**: The blend of supplies from the SWP, Colorado River, and storage programs are considered in meeting a salinity objective of 500 mg/L of total dissolved solids whenever practical and reasonable, as outlined in the Salinity Management Policy and Action Plan, which the Board adopted concurrently with the WSDM Plan.
- **Emergency Storage**: Emergency storage is reserved within Southern California reservoirs to meet critical demands following potential catastrophic events. Emergency storage holds water in reserve to protect against an earthquake or other damage to the imported supply aqueducts. Emergency storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement their local production. In 2019, Metropolitan and its member agencies updated the storage objective from 630,000 to 750,000 acre-feet.
- **Minimizing Extreme and Volatile Supply Allocations**: Regional storage is managed to avoid or reduce the frequency of severe water supply allocations and to avoid large increases in WSAP levels from year to year, to the extent practicable.

Operational Considerations

There are many significant operational considerations in the management of regional storage in times of surplus and shortage. The WSDM Plan allows for operational flexibility to meet critical system and supply needs.

System Needs

One key operational objective is to maintain storage to provide deliveries to areas served predominantly or exclusively by a specific resource. The portion of Metropolitan's system served solely by SWP deliveries comprises approximately one-third of annual system demands, on average. Storage along the SWP system is maintained to help ensure that needs in these exclusive areas can be met under low SWP allocations. For example, in 2009 and 2014 (dry years), storage actions were taken to preserve SWP carryover supplies and

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refill storage in Metropolitan's Flexible Storage Account in Castaic Lake and Lake Perris. These actions helped meet SWP demands in these areas and protected against future dry years. Despite meager SWP allocations, exclusive SWP demands could be met in 2010 and 2015 because of available SWP Carryover and SWP Flexible Storage, in addition to storage balances available in the Central Valley groundwater programs. It is important to note that whenever SWP supplies exceed the amount necessary to meet exclusive area demands, water stored in SWP related programs and reservoirs can also be used to meet demands in the nonexclusive SWP portions of the service area.

Other operational constraints include the limitations in delivering untreated surface water containing quagga mussels into bodies of water that do not already include quaggas. This currently limits the storage of Colorado River water (CRW) into DVL unless a quagga mussel control plan is approved by the California Department of Fish and Wildlife and a project is developed to implement any required treatment and monitoring.

Metropolitan has taken unprecedented actions to minimize the SWP exclusive demand areas and reduce the need to draw on SWP storage programs during multi-year droughts such as the current drought which began in 2020. Improvements include fully refurbishing the Greg Avenue pump station which has an ability to pump approximately 3,000 acre-feet per month of treated Colorado River supplies into a zone otherwise only served with SWP deliveries. In addition, through an agreement with DWR and some distribution system upgrades, the 150 million-gallons-per day Mills Water Treatment Plant has also been taken completely off of the SWP system and can now deliver water previously stored in DVL by gravity flow. Third, the Board approved a two-year program with participating member agencies to provide a credit to offset the increased costs and impacts incurred by shifting deliveries to service connections supplying Colorado River supplies. These three actions work together with SWP storage programs to help protect the region from multiple dry years.

Contractual Requirements

Contractual requirements generally specify the timing and flow capacity of the storage portfolio. A contracted storage program will often require early notification so that the partner can plan for and adjust operations. These storage programs also typically have available capacity during shoulder months of the spring or fall when the water supply balance for the year remains uncertain. If the storage is called during a time when return capacity is available, and then demands drop and other supplies (such as the SWP allocation) increase, the value of the call diminishes. In this case, the water is typically moved to in-region surface storage to be readily available during a future drought.

Metropolitan has also entered into agreements to exchange or return previously stored water. These agreements represent storage "debt" to be repaid in the future and under conditions that mitigate impacts during supply shortages. Metropolitan must return a total of 494,000 acre-feet in future years to Imperial Irrigation District (164,000 acre-feet) and Southern Nevada Water Authority (330,000 acre-feet).

Other agreements, such as the Drought Contingency Plan, obligate the State of California to make contributions to support the elevation of Lake Mead. California's contributions would range from 200,000 to 350,000 acre-feet a year, depending on the lake's elevation. Metropolitan is responsible for 93 percent of California's DCP Contributions under the Lower Basin DCP.

Other Factors

When storage decisions are made, they are made first with respect to the total amount in storage, to evaluate whether there is enough storage to meet a shortfall in projected imported supplies. Then, individual reservoirs, storage programs, and actions are evaluated with respect to each other. For example, when DVL is reasonably full, use of its storage to meet shortages is typically more aggressive, since it is readily available and can be pulled at a reasonable cost. However, as DVL becomes depleted, it is operated more conservatively, and other storage programs are activated because the remaining storage in DVL represents a highly reliable in-region supply. Similarly, DVL serves as a backstop for the unavailability or

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implementation risk that can be associated with other supply or storage actions, such as SWP Buyers Group Transfer supplies or groundwater storage program capacity constraints.

Other Considerations

Water Supply Allocation Plan

The WSAP was first developed and approved by the Board in April 2009 to set a formula for allocating supplies to the member agencies in times of shortage. Through a pricing mechanism, the WSAP discourages the use of supplies above a specified amount designed to share needs equitably. The WSDM Plan called for implementing an allocation plan as the potential supply shortages become more severe. The WSAP has been developed and implemented in accordance with a fundamental guiding principle.

“Metropolitan will encourage storage of water during periods of surplus and work jointly with its Member Agencies to minimize the impacts of water shortages on the region’s retail consumers and economy during period of shortage.”

This guiding principle provides direction that the WSAP, developed and implemented by Metropolitan, must account for disparate impacts at the retail water use level across Metropolitan’s service area. In addition, the WSDM Plan also included considerations to accomplish an equitable, needs-based regional allocation of Metropolitan supplies during times of shortage. These considerations include impact on retail customers and the economy, allowance for population and growth, local investments, changes in supply conditions, the demand hardening aspects of non-potable recycled water use, and the implementation of conservation savings programs.

Water Shortage Contingency Plan

In 2021, the Board adopted Metropolitan’s Water Shortage Contingency Plan (WSCP) concurrently with the adoption of the 2020 Urban Water Management Plan. The WSCP fulfills requirements from the 2018 Conservation as a California Way of Life legislative package (AB 1668 and SB 606) and describes to DWR Metropolitan’s intended actions during water shortage conditions. The WSCP documents Metropolitan’s annual assessment of a water shortage (defined as the difference between expected demands and core supplies) and must be submitted to DWR by July 1 of each year beginning in 2022. The WSCP describes planned actions and communication strategies to be taken during five levels of potential shortages. The shortage response actions reported to DWR reflect the tenets of WSDM Plan actions including takes from storage, supply augmentation, and if needed, WSAP allocations for demand reduction.

Coordination and Communication Processes

Though the WSDM plan guides staff’s management of supply and storage resources, these activities are regularly reported and discussed with the Board, member agencies, and other stakeholders. Four main elements of this communication include:

- **WSDM Reporting:** Every month through the active water year (generally December through June), staff prepares a regular Board report and presentation to provide updates on hydrologic conditions, projected demands, and storage conditions.
- **Water Supply Condition:** On an annual basis and through the WSDM reporting, Metropolitan sets a Water Supply Condition to one of four conditions: Baseline (water use efficiency); Condition 1 (Water Supply Watch); Condition 2 (Water Supply Alert); and Condition 3 (Water Supply Allocation). These conditions communicate storage conditions and align with public affairs messaging.
- **Water Shortage Stage:** Staff will conduct the WSCP assessment each spring beginning in 2022 to determine the level of shortage, if any, reported to the State. These reports provide DWR, the member agencies, and other stakeholders with a snapshot of water supply conditions and potential shortages.
- **WSAP Implementation:** The WSAP takes effect if the Board of Directors declares a regional shortage. The allocation period covers twelve consecutive months from July through the following June; this period

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minimizes the impacts of varying SWP allocations and provides member agencies with sufficient time to implement their outreach and response strategies. Metropolitan staff would recommend a Regional Shortage Level based on water supply availability and the implementation of WSDM actions. Staff would recommend an allocation to the Board by April of any year when needed. By the April meeting, most of the winter snowfall accumulation period will have passed and will allow staff to make an allocation based on more stable water supply estimates.

Conclusion

Managing regional storage according to the WSDM Plan and operating principles is an iterative process that accounts for changing supplies, demands, and operational requirements throughout the year. Managing storage through these principles has enabled the region to maintain a high degree of water supply reliability and takes advantage of intermittent wet years and the continued conservation and local supply efforts to build and preserve storage. Staff regularly reports conditions to the Board and member agencies and implements progressive actions as needed. Metropolitan also reports annually on the Water Supply Condition Framework (beginning in 2022) and the Water Shortage Stage. If required, staff brings to the Board any recommendations for board approval for the setting of a water supply allocation level.