THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Board Action

- **Board of Directors**
  One Water and Adaptation Committee

5/12/2026 Board Meeting

7-5

Subject

Adopt Metropolitan's (1) 2025 Urban Water Management Plan and (2) Water Shortage Contingency Plan and their corresponding resolutions for submittal to the State of California; the General Manager has determined the proposed action is exempt or otherwise not subject to CEQA

Executive Summary

Metropolitan prepared its 2025 Urban Water Management Plan (UWMP) and Water Shortage Contingency Plan (WSCP) by working through a collaborative process with the member agencies, other appropriate entities, and the public. The information in the 2025 UWMP demonstrates Metropolitan's water supply reliability under the conditions required by the Urban Water Management Planning Act in the California Water Code (Act). The 2025 UWMP complies with California state law requiring urban water suppliers to prepare and update urban water management plans every five years. The WSCP contains Metropolitan's actions to respond to actual water shortage conditions.

Timing

Metropolitan released its draft 2025 UWMP and WSCP for public review starting on February 6, 2026, and a public hearing was conducted on April 13, 2026, at the Board's One Water and Adaptation Committee meeting. Comments received from the member agencies and the public during the review process were considered and incorporated where appropriate into the final 2025 UWMP and WSCP. After the public hearing, the urban water supplier's governing body must formally adopt the UWMP and WSCP. The adopted plans will be submitted to the California Department of Water Resources (DWR), the California State Library, and any city or county within which the supplier provides water supplies no later than 30 days after adoption and by July 1, 2026. Metropolitan's 2025 UWMP and WSCP are completed and ready for submittal after the Board's adoption.

Proposed Action(s)/Recommendation(s) and Options

Staff Recommendation: Option #1

Option #1

a. Adopt Metropolitan's 2025 UWMP (**Attachment 1**) and its corresponding resolution (**Attachment 3**) for submittal to the State of California.
b. Adopt Metropolitan's WSCP (**Attachment 2**) and its corresponding resolution (**Attachment 4**) for submittal to the State of California.

Fiscal Impact: None
Business Analysis: Adoption and submittal of the 2025 UWMP and WSCP will allow Metropolitan to comply with the Urban Water Management Planning Act in the California Water Code and be eligible for DWR-administered state grants and loans.

Option #2

Direct staff to make changes to the 2025 UWMP and WSCP based on policy direction, and to resubmit the 2025 UWMP and WSCP, and their corresponding resolutions, to the Board for adoption and submittal to the State of California at a later date.

Fiscal Impact: None

Business Analysis: Delayed submission of the 2025 UWMP would cause Metropolitan to miss the July 1, 2026, deadline as specified in the Act and may affect eligibility for DWR-administered state grants and loans. Failure to timely adopt and submit the 2025 UWMP and WSCP could result in legal challenge under the Act.

Alternatives Considered

Not applicable

Applicable Policy

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities.

Metropolitan is required by law to meet the requirements of the Act, California Water Code Division 6, Part 2.6, Urban Water Management Planning, and California Water Code Section 10608.36, which guide preparation of the urban water management plans and water shortage contingency plans.

Related Board Action(s)/Future Action(s)

Not applicable

Summary of Outreach Completed

The draft UWMP and WSCP were developed through a collaborative process with the member agencies and other appropriate agencies and were made available for public inspection prior to public hearing and adoption. The public review drafts of the documents were posted on Metropolitan's website on February 6, 2026. Metropolitan notified the public and stakeholders of the preparation of these documents and the timing of the public hearing through newspaper advertisements, letters to cities and counties within the service area, social media outreach, and direct communications with the member agencies. The public hearing was held to coincide with the regularly scheduled One Water and Adaptation Committee Meeting on April 13, 2026.

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is exempt from CEQA because it involves the preparation and adoption of urban water management plans and water shortage contingency plans. (California Water Code Section 10652; State CEQA Guidelines Section 15282(v)).

CEQA determination for Option #2:

None required

Details and Background

Background

A discussion of the 2025 UWMP and WSCP is provided below.

2025 Urban Water Management Plan

The Act requires that every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually prepare and adopt, in accordance with prescribed requirements, an urban water management plan. The Act requires submission of an updated UWMP to the DWR every five years. An UWMP is required in order for a water supplier to be eligible for a water grant or loan awarded or administered by the state. Legal actions may be filed against suppliers that fail to timely adopt and submit UWMPs and WSCPs.

The Act requires urban water suppliers to perform fundamental planning analyses to evaluate supply reliability as part of the development of an UWMP, including: (1) a water service reliability assessment, which requires development of a detailed evaluation of the supplies necessary to meet demands over at least a 20-year period in normal water year, single dry-year, and five consecutive drought year conditions; and (2) a drought risk assessment comparing the total water supply available with the total projected water use for the drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted. In addition, the Act requires urban water suppliers to describe water supply projects and programs, efficient uses of water, demand management measures, implementation strategy and schedule, water quality impacts, Seismic Risk Assessment and Mitigation Plan, and the supplier's coordination process with various stakeholders in preparation of the plans. Metropolitan developed the required reliability assessments of the 2025 UWMP **(Attachment 1)** through an extensive collaboration process with its member agencies and other appropriate agencies.

The 2025 UWMP satisfies all the procedural and substantive requirements mandated by the Act and provides a comprehensive summary of Metropolitan's water demand and supply outlook through 2050 under the conditions specified in the UWMP. The key reporting points of this plan include:

- Metropolitan has completed its water service reliability assessments, under the stated UWMP assumptions and conditions required by the Act, and determined that it has sufficient supply capabilities to meet expected demands from 2030 through 2050 under normal water year, single dry-year, and five consecutive drought year conditions.
- Metropolitan has evaluated its water shortage risk, under the UWMP assumptions and conditions required by the Act, and determined that it has sufficient supply capabilities for a drought period that lasts five consecutive water years based on the driest five-year historic sequence for Metropolitan's water supply. This Drought Risk Assessment was completed starting from the year following when the assessment is conducted (2026 through 2030).
- Metropolitan plans for supply implementation and continued development of a diversified resource portfolio, including programs in the Colorado River Aqueduct, State Water Project (SWP), Central Valley storage and transfers programs, local resource projects, and in-region storage that position the region to meet its water supply needs.
- Metropolitan continues to invest in water use efficiency measures that will help the region meet its projected water demands.
- Metropolitan has and will continue to regard water quality with paramount importance to water supply reliability. Metropolitan owns and operates five water treatment plants, three of which are among the 10 largest in the world. Metropolitan is a national leader in providing safe drinking water that meets increasingly stringent standards, testing for over 400 constituents, and performing nearly 250,000 water quality tests annually on samples gathered throughout its distribution system to ensure that delivered water meets or surpasses all state and federal drinking water standards.

Water Shortage Contingency Plan

Metropolitan's WSCP (**Attachment 2**) complies with California Water Code (CWC) Section 10632, which requires that every urban water supplier shall prepare and adopt a WSCP as part of its UWMP. Section 10632.2 provides: "An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its Water Shortage Contingency Plan... or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1."

The WSCP is a guide for Metropolitan's intended actions during water shortage conditions. It is meant to improve preparedness for droughts and other impacts on water supplies by describing the process used to address varying degrees of water shortages. The Act requires the WSCP to contain certain elements, including response actions that align with six standard water shortage levels based on water supply conditions, as well as shortages resulting from catastrophic supply interruptions. The WSCP also describes Metropolitan's procedures for conducting an Annual Water Supply and Demand Assessment that is required by CWC Section 10632.1 and is to be submitted

to DWR on or before July 1 of each year, or within 14 days of receiving final allocations from the SWP, whichever is later.

The WSCP satisfies all the procedural and substantive requirements mandated by the Act and contains Metropolitan's efficient management and planned actions to respond to actual water shortage conditions. Metropolitan's 2025 WSCP is included as Appendix 4 to its 2025 UWMP; however, the WSCP is developed as an independent plan that can be amended, as needed, without amending the UWMP. The key components of the WSCP include the following:

- Metropolitan's WSCP contains the following eight required elements that wholesale water suppliers must include in water shortage contingency plans: (1) summary of water supply reliability assessment, (2) annual water supply and demand assessment procedures, (3) six standard water shortage stages, (4) shortage response actions, (5) communication protocols, (6) legal authorities, (7) financial consequences, and (8) WSCP refinement procedures.
- Metropolitan has developed comprehensive plans for stages of actions it would undertake to address frequent and severe periods of droughts; six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage; and a catastrophic interruption in water supplies through its WSCP, Water Surplus and Drought Management Plan, and Water Supply Allocation Plan.
- Metropolitan continues to plan for emergency and catastrophic scenarios through its Emergency Storage Objective to manage against potential interruption in water supplies resulting from catastrophic occurrences within the Southern California region, including seismic events along the San Andreas fault, and a Seismic Risk Assessment and Mitigation Plan to assess the vulnerability of Metropolitan's water system and mitigate those vulnerabilities. In addition, Metropolitan is working with the state on the Delta Risk Management Strategy to reduce the impacts of a seismic event in the Delta that would cause levee failure and disruption of SWP deliveries.

4/23/2026

Brandon J. Goshi *Date*
Manager, Water Resource Management

4/23/2026

Shivaji Deshmukh *Date*
General Manager

Attachment 1 – 2025 Urban Water Management Plan

Attachment 2 – 2025 Water Shortage Contingency Plan

Attachment 3 – Resolution Adopting the 2025 Urban Water Management Plan

Attachment 4 – Resolution Adopting the 2025 Water Shortage Contingency Plan

Ref# wrm12705975

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA



May 2026 Draft

May 2026_

2025 Urban Water Management Plan

May 2026__

2025 Urban Water Management Plan

May 2026 Draft

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

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LIST OF ABBREVIATIONS

Abbreviation	Terms
Units of Measurement	
AF	Acre-Feet
AFY	Acre-Feet Per Year
cfs	Cubic Feet Per Second
GPCD	Gallons Per Capita Per Day
kWh	Kilo-Watt Hour
lbs./day	Pounds Per Day
MAF	Million Acre-Feet
µg/L	Micrograms Per Liter
mg/L	Milligrams Per Liter
MGD	Million Gallons Per Day
MW	Megawatt
ng/L	Nanograms Per Liter
pCi/L	Picocuries Per Liter
ppt	Parts Per Trillion
TAF	Thousand Acre-Feet
Acronyms	
1,2,3-TCP	1,2,3-Trichloropropane
50LOC	50 Percent Level of Concern
AB	Assembly Bill
ADWR	Arizona Department of Water Resources
AMPAC	American Pacific Corporation
AVEK	Antelope Valley-East Kern Water Agency
AWWA	American Water Works Association
BDCP	Bay Delta Conservation Plan
BESS	Battery Energy Storage System
BICS	Binational Intentionally Created Surplus
BIL	Bipartisan Infrastructure Law
BMPs	Best Management Practices
CAISO	California Independent System Operator
Cal OES	California Office of Emergency Services
CalWARN	California Water/Wastewater Agency Response Network
CALWEP	California Water Efficiency Partnership
CAMP4W	Climate Adaptation Master Plan for Water
CAP	Climate Action Plan
CASP	California Aqueduct Subsidence Program
CAWCD	Central Arizona Water Conservation District
CBM	Condition-Based Maintenance
CCL	Contaminant Candidate List
CCP	Conservation Credits Program
CDFW	California Department of Fish and Wildlife

LIST OF ABBREVIATIONS

Abbreviation	Terms
CEC	California Energy Commission
CECs	Constituents of Emerging Concern
CEEF	California Environmental Education Foundation
CEQA	California Environmental Quality Act
CII	Commercial, Industrial, and Institutional
CIMIS	California Irrigation Management Information System
CIP	Capital Investment Plan
CMIP	Coupled Model Intercomparison Project
CMMS	Computerized Maintenance Management System
COA	Coordinated Operations Agreement
CPP	Community Partnering Program
CRA	Colorado River Aqueduct
CRCN	Colorado River Commission of Nevada
CRIS	Climate Registry Information System
CRSS	Colorado River Simulation System
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
CVWD	Coachella Valley Water District
CWC	California Water Code
CWSRF	Clean Water State Revolving Fund
CY	Calendar Year
D/DBP	Disinfectants/Disinfection Byproduct
DAC	Disadvantaged Community
DBP	Disinfection Byproduct
DCP	Drought Contingency Plan
DCP	Delta Conveyance Project
DCR	SWP Delivery Capability Report
DDW	The SWRCB's Division of Drinking Water
DFW	Department of Fish and Wildlife
DLR	Detection Level for purposes of Reporting
DOE	U.S. Department of Energy
DOF	California Department of Finance
DPR	Direct Potable Reuse
DRA	Drought Risk Assessment
DSOD	Division of Safety of Dams
DSP	Dam Safety Program
DTSC	California Department of Toxic Substances Control
DVL	Diamond Valley Lake
DWA	Desert Water Agency
DWCV	Desert Water Agency/Coachella Valley Water District
DWPRP	Desalination and Water Purification Research Program
DWR	California Department of Water Resources

LIST OF ABBREVIATIONS

Abbreviation	Terms
EAP	Emergency Action Plan
EDD	California Employment Development Department
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
EOC	Emergency Operations Center
ERO	Emergency Response Organization
ERP	Emergency Response Plan
ESA	Endangered Species Act
ESP	Energy Sustainability Plan
ET_o	Evapotranspiration
EWCP	Emergency Water Conservation Program
FFPCS	Foothill Feeder Pressure Control Structure
FSA	Future Supply Actions
FWUA	Friant Water Users Authority
FY	Fiscal Year
GHG	Greenhouse Gas
GRP	Groundwater Recovery Program
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
GWRS	Groundwater Replenishment System
HECW	High-Efficiency Clothes Washer
HET	High-Efficiency Toilet
HRL	Healthy Rivers and Landscapes
HTC	Hyatt-Thermalito Complex
ICLEI	International Council for Local Environmental Initiatives
ICP	Innovative Conservation Program
ICP	Incident Command System
ICS	Intentionally Created Surplus
IEUA	Inland Empire Utilities Agency
IID	Imperial Irrigation District
IOP	Interim Operations Plan
IPR	Indirect Potable Reuse
IRP	Integrated Water Resources Plan
IRPSIM	Integrated Water Resources Plan Simulation Model
ITP	Incidental Take Permit
JWPCP	Joint Water Pollution Control Plant
LAA	Los Angeles Aqueduct
LADWP	Los Angeles Department of Water and Power
LBOps	Lower Basin Drought Contingency Operations
LC Conservation Program	Lower Colorado River Basin System Conservation and Efficiency Program

LIST OF ABBREVIATIONS

Abbreviation	Terms
LRP	Local Resources Program
LSJR	Lower San Joaquin River
LSWRP	Large-Scale Water Recycling Program
M&I	Municipal & Industrial
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MFR	Multi-family Residential
MLPA	Marine Life Protected Area
MOU	Memorandum of Understanding
MWD	The Metropolitan Water District of Southern California
MWD-EDM	Metropolitan's Econometric Demand Model
MWDOC	Municipal Water District of Orange County
MWELO	Model Water Efficient Landscape Ordinance
MWQI	Municipal Water Quality Investigations
NASA	National Aeronautics and Space Administration
NAWI	National Alliance for Water Innovation
NDBA	N-Nitrosodi-n-butylamine
NDEP	Nevada Division of Environmental Protection
NDMA	N-nitrosodimethylamine
NEPA	National Environmental Policy Act
NERT	Nevada Environmental Response Trust
NIMS	National Incident Management System
NL	Notification Level
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRDC	Natural Resources Defense Council
O&M	Operations and Maintenance
OCWD	Orange County Water District
OEHHA	Office of Environmental Health Hazard Assessment
PCCP	Prestressed Concrete Cylinder Pipe
PFAS	Per- and polyfluoroalkyl substances
PFBS	Perfluorobutane sulfonic acid
PFHxS	perfluorohexane sulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PG&E	Pacific Gas & Electric
PHG	Public Health Goal
polyDADMAC	polydiallyldimethylammonium chloride
PPCP	Pharmaceutical and Personal Care Product
PPRs	Present Perfected Rights
PVID	Palo Verde Irrigation District
QMCP	Quagga Mussel Control Program

LIST OF ABBREVIATIONS

Abbreviation	Terms
QSA	Quantification Settlement Agreement
RDM	Robust Decision Making
RIDM	Risk-Informed Decision Making
RL	Response Level
ROD	Record of Decision
RPA	Reasonable and Prudent Alternative
RPAs	Reasonable and Prudent Alternatives
RRWP	Regional Recycled Water Program
RTP	Regional Transportation Plan
RTS	Readiness-to-Serve Charge
RWA	Raw Water Augmentation
SAF	San Andreas Fault
SANDAG	San Diego Association of Governments
SAR	System Access Rate
SARI Line	Santa Ana Regional Interceptor Line
SB	Senate Bill
SB X7-7	Senate Bill X7-7, Water Conservation Act of 2009
SCAG	Southern California Association of Governments
SCCWRP	Southern California Coastal Water Research Project
SCWC	Southern California Water Coalition
SCWD	South Coast Water District
SDCWA	San Diego County Water Authority
SDP	Seawater Desalination Program
SED	Substitute Environmental Document
SEMS	Standardized Emergency Management System
SFR	Single-Family Residential
SGMA	Sustainable Groundwater Management Act
SLR	Sea Level Rise
SNMP	Salt and Nutrient Management Plan
SNWA	Southern Nevada Water Authority
SPR	System Power Rate
SRWSTF	Seismic Resilience Water Supply Task Force
SWC	State Water Contractors
SWP	State Water Project
SWQPA	State Water Quality Protection Area
SWRCB	State Water Resources Control Board
TCR	The Climate Registry
TDS	Total Dissolved Solids
TOC	Total Organic Carbon
TVMWD	Three Valleys Municipal Water District
UCMR	Unregulated Contaminant Monitoring Rule
USBR	U.S. Department of the Interior, Bureau of Reclamation

LIST OF ABBREVIATIONS

Abbreviation	Terms
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
UWMP	Urban Water Management Plan
VOC	Volatile Organic Compound
WEEA	Water Energy Education Alliance
WET	Water Education Today
WIFIA	Water Infrastructure Finance and Innovation Act
WRAP	Water Reuse Action Plan
WRD	Water Replenishment District of Southern California
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan
WSDM Plan	Water Surplus and Drought Management Plan
WTP	Water Treatment Plant
WUCA	Water Utility Climate Alliance
WUE	Water Use Efficiency
YCWA	Yuba County Water Agency

Phrases

Act	Urban Water Management Planning Act
Annual Assessments	Annual Water Supply and Demand Assessment
Army Corps	U.S. Army Corps of Engineers
Arvin-Edison	Arvin-Edison Water Storage District
Bank	Governor's Water Bank
Bay-Delta	San Francisco Bay/Sacramento-San Joaquin Delta
California Plan	California's Colorado River Water Use Plan
Delta	Sacramento/San Joaquin River Delta
Forum	Colorado River Basin Salinity Control Forum
Kern Delta	Kern Delta Water District
Metropolitan	The Metropolitan Water District of Southern California
Mojave	Mojave Water Agency
MWD Act	Metropolitan Water District Act
Plan	Urban Water Management Plan
Policy	State Recycled Water Policy
Regional Board	Regional Water Quality Control Board
Sanitation Districts	Los Angeles County Sanitation Districts
Semitropic	Semitropic Water Storage District
SoCalGas	Southern California Gas Company
Warren Facility	A.K. Warren Water Resource Facility

Summary of Compliance

SB X7-7	
Water Code § 10608.36 – Assessment of Measures, Programs, and Policies	Assess present and proposed future measures, programs, and policies to help achieve water use reduction targets. • Metropolitan's actions to help achieve the urban per capita water use reduction pursuant to the goals set forth in SB X7-7 are discussed in Chapters 3.4, 3.5, and 3.7.
Agency Coordination	
Water Code § 10610.2(a)(4)	Water suppliers should collaborate closely with local land-use authorities to ensure water demand forecasts are consistent with current land-use planning. • See Chapters 2 and 5 and Appendix 1.
Water Code § 10620(d)(2) – Develop Water Shortage Contingency Plan	Each urban water supplier shall develop its own water shortage contingency plan. • See Chapter 2.5 and Appendix 4.
Water Code § 10620(d)(3) – Coordination with Appropriate Agencies	Describe the coordination of the plan preparation. • See Chapter 5.
Water Code § 10620(f) – Describe Resource Maximization/Import Minimization Plan	Discuss how water management tools and options are used to maximize resources and minimize the need to import water. • Metropolitan's planning strategy within the IRP and adaptive implementation approach are discussed in Chapter 2 and provide an overview of the water management tools and options. See pages 2-2 through 2-8. • Further details are provided in Chapters 1.4 (conservation and local resources, pages 1-25 through 1-27), 3.4 (demand management and conservation, pages 3-42 through 3-67), and 3.5 (recycling, groundwater recovery, and desalination, pages 3-68 through 3-95).
Water Code § 10621(b) – City and County Notification and Participation	Notify any city or county within service area of Urban Water Management Plan (UWMP) review & revision at least 60 days before public hearing. May consult with and obtain comments from notified cities and counties. • Notification and participation are discussed in Chapter 5, pages 5-1 through 5-11, and Appendix 11, DWR Submittal Table 10-1.
Water Code § 10621(a) – Plan Submittal to Department of Water Resources (DWR)	Each urban water supplier shall update its plan at least once every five years on or before July 1, in years ending in six and one, incorporating updated and new information from the five years preceding each update. • Submission of the 2025 UWMP by the July 1, 2026, deadline is detailed in Chapter 5.
Contents of UWMP	
Water Code § 10630.5 – Simple Lay Description	Include a simple lay description of how much water the agency has on a reliable basis, how much it needs for the foreseeable future, the agency's strategy for meeting its water needs, the challenges the agency faces, and any other information necessary to provide a general understanding of the plan. • The Simple Lay Description is contained in the Executive Summary.

Summary of Compliance

Water Code § 10631(a) – Service Area Information	Describe service area of supplier. • Service area is discussed in Chapter 1.2, pages 1-6 through 1-11 and shown in Figure 1-1. Include current and projected population. • Population is discussed in Chapter 1.3 and shown in Table 1-1, Figure 1-2, and Figure 1-3. • Population analysis is discussed in Appendix 1, page A.1-3. Projections are on page A.1-11, Table A.1-2. • Current and projected population are shown in Appendix 11, DWR Submittal Table 3-1. Population projections must be based on data from state, regional or local service agency projections. • See footnote Table A.1-2, page A.1-7. Describe climate characteristics that affect water management • See Chapter 1.3, pages 1-14 through1-16, Figure 1-5, and Table 1-4, and Chapter 2.6, pages 2-52 through 2-57. Describe other social, economic, and demographic factors affecting water management. • See Chapter 1.3, pages 1-12 through 1-14 and Appendix 1. Describe current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Suppliers shall coordinate with local or regional land use authorities to determine the most appropriate land use information. • See methodologies and assumptions for developing projections of demand and water use in Chapter 2.2.
Water Code § 10631(b)(1-3) – Water Sources	Identify and quantify existing and planned water supply sources in 5-year increments to 20 years or as far as data is available. • Current supplies and quantities are described in Chapter 1.4, pages 1-20 through 1-33. • Historic and current water supplies are described in Appendix 2. • Planned water supplies and quantities are discussed in Chapter 2, and details are provided in Appendix 3, and particularly in Table A.3-7 and A.3-8, pages A.3-65 through A.3-80. • See Appendix 11, DWR Submittal Tables 6-8 and 6-9. Detailed discussion of anticipated supply availability under normal water year, single dry year, and droughts lasting at least 5 years, as well as more frequent and severe drought periods (as described in the drought risk assessment). For each water supply source, consider any information pertinent to the Section 10635 reliability analysis, including climate change. • See Chapter 2, Tables 2-4 through 2-7, pages 2-22 through 2-24. • See Chapter 2.2 (estimating demand on Metropolitan), page 2-9, Chapter 2.3 (water reliability assessment), pages 2-17 through 2-24, Chapter 2.4 (drought risk assessment), pages 2-25 through 2-29, Chapter 2.6 (other supply reliability risks), pages 2-51 through 2-57, and the discussions presented under the Colorado River and State Water Project (SWP), Central Valley/State Water Project Storage and Transfer Programs, Chapters 3.1, 3.2, and 3.3. • See Chapter 3 and Appendices 3 and 5. • See Appendix 11, DWR Submittal Tables 7-2, and 7-5. Describe the management of each supply source in correlation with the other supplies. • See Chapter 3 and Appendix 3. Describe the measures being taken to acquire and develop planned water supply sources. • See Chapter 3 and Appendix 3.

Summary of Compliance

Water Code § 10631(b)(4) – If Groundwater Identified as Existing or Planned Source	Metropolitan does not supply groundwater. However, Metropolitan partners with various entities for groundwater storage and exchange programs. • See Chapters 3.3, 3.5, and 3.6; Appendix 2; and Appendix 3 for discussions of issues related to groundwater basins. • See Chapter 4 for salinity issues related to groundwater basins.
Water Code § 10631(c) – Transfer or Exchange Opportunities	Describe short-term and long-term exchange or transfer opportunities. • Chapter 1.4 (augmenting water supplies), pages 1-28 through 1-29. • Chapter 3.1 (pages 3-3 through 3-16) describes plans for banking, exchange and transfer opportunities along the Colorado River and Aqueduct. • Chapter 3.2 (pages 3-17 through 3-34) describes plans for banking, exchange and transfer opportunities within the State Water Project. • Chapter 3.3 (pages 3-35 through 3-41) describes plans for banking, exchange and transfer opportunities within the Central Valley/State Water Project. • Chapter 3.6 (pages 3-96 through 3-99) describes plans for banking, exchange and transfer opportunities within the local region. • Further details are provided in Appendix 3, particularly Table A.3-7 on pages A.3-65 through A.3-77.
Water Code §§ 10631(d)(1) and (2) – Past, Current, and Projected Water Use	Urban retail water suppliers are to quantify past, current, and projected water use by sector in five-year increments. • Not applicable to Metropolitan (which is a wholesaler) because this reporting requirement applies only to urban retail water suppliers. However, Metropolitan voluntarily provides this information in the following Chapters: • See Chapter 1.3, page 1-13 and Figure 1-4 for historical retail water demands. • Past, current, and future water uses are shown in Appendix 1, Table A.1-5 on page A.1-8. Water uses by sector and county are shown in Tables A.1-6 and A.1-7 on page A.1-9. Water demands are shown in Appendix 11 DWR Submittal Table 4-2. Identify and quantify sales to other agencies. • See Chapter 1.3, page 1-13 and Figure 1-4 for historical retail water demands. • Historic sales are presented in Table A.2-2 on page A.2-3. • Metropolitan does not project sales by individual agency. However, total projected sales/demands to other agencies are shown in Chapter 2.2, pages 2-9 through 2-16.
Water Code §§ 10631(d)(1)(J), (d)(3)(A)-(C) – Distribution System Water Loss	Urban retail water suppliers are to quantify distribution system water loss for each of the 5 years before the plan update. • Not applicable to Metropolitan (which is a wholesaler) because this reporting requirement applies only to urban retail water suppliers.
Water Code § 10631(d)(4)(A) and (B) – Water Savings Estimate	Water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans. Provide citations to the codes, standards, ordinances, or transportation and land use plans used to make projections. Indicate extent that water use projections consider savings from codes, standards, ordinances, or transportation and land use plans. • See discussion on estimating demands and code-based conservation in Chapter 2, page 2-11 and Appendix 6.

Summary of Compliance

Water Code § 10631(e)(2) – Description of Supplier's Water Demand Management Measures, Distribution System Asset Management, Assistance Programs	Provide narrative description of items in §10631(e)(1)(B)(ii), (iv), (vi), and (vii), distribution system asset management, and wholesale supplier assistance programs. • See discussion on metering, Chapter 3.4, page 3-56. • See discussion on public education and outreach, Chapter 3.4, pages 3-43 through 3-52. • See discussion on water conservation programs, Chapter 3.4, pages 3-53 through 3-62. • See discussion on demand management and conservation, Chapter 3.4, pages 3-42 through 3-62. • See discussion on distribution system asset management, Chapter 3.4, pages 3-63 through 3-67. • See discussion on assistance programs to retail water agencies (rebate programs, public education and outreach, and other efforts to reduce water demand), Chapter 3.4, pages 3-53 through 3-62.
Water Code § 10631(f) – Planned Water Supply Projects and Programs	Detailed description of expected future supply projects & programs to meet projected water use. Timeline for each proposed project or program Quantification of each project's normal water year yield (AFY) Quantification of each project's single dry-year water year yield (AFY) Quantification of each project's 5-year drought yield (AFY) • Chapter 3.1 (pages 3-3 through 3-16) describes plans for banking, exchange and transfer opportunities along the Colorado River and Aqueduct. • Chapter 3.2 (pages 3-17 through 3-34) describes plans for banking, exchange and transfer opportunities within the State Water Project. • Chapter 3.3 (pages 3-35 through 3-41) describes plans for banking, exchange and transfer opportunities within the Central Valley/State Water Project. • Chapter 3.6 (pages 3-96 through 3-99) describes plans for banking, exchange and transfer opportunities within the local region. • Further details are provided in Appendix 3, particularly Table A.3-7 on pages A.3-65 through A.3-77. • See Appendix 11, DWR Submittal Table 6-7.
Water Code § 10631(g) – Opportunities for Development of Desalinated Water	Describe opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply. • See discussion on groundwater recovery and seawater desalination in Chapter 1.4, pages 1-23 through 1-25, and Chapter 3.5, pages 3-68 through 3-95. • See Appendix 5 for existing, under construction, CEQA, and conceptual projects and their ultimate yield/capacity.
Water Code § 10631(h) – If Supplier Relies on a Wholesale Supplier for Water	Urban water suppliers that rely on a wholesale agency for water source must provide wholesale agency with water use projections in 5-year increments to 20 years or as far as data is available. Wholesaler to provide urban water suppliers with existing and planned water supply availability projections, by source, and planned water supply quantities over same 5-year increments and during various water-year types. • See discussions on Metropolitan and member agency coordination in Chapters 2 and 5. • See Appendix 3, Table A.3-7, and Appendix 11, DWR Submittal Table 2-4.
Water Code § 10631.1 – Projected Water Use for Low-Income Housing	Water use projections for single-family and multi-family residential housing for lower income households. • This is incorporated with the retail demand forecast, as reflected in Chapter 2 and Appendix 1.

Summary of Compliance

Water Code § 10631.2 –Calculation or Estimation of Energy Intensity of Urban Water Systems	Must include any of the following that the supplier can readily obtain: estimated amount of energy for extraction or diversion (from sources), conveyance, treatment, distribution, treated water supplies compared to nontreated water supplies, and storage of water, and any other appropriate energy-related information. • Estimate of the amount of energy used and energy intensity is presented in Appendix 9. • See Chapter 3.8 for discussion of Metropolitan's Energy Management Initiative.
Water Shortage Contingency Plan	
Water Code § 10632 – Water Shortage Contingency Plan **Water Code § 10632(a)(1) – Analysis of Water Supply Reliability**	Every supplier shall prepare and adopt a water shortage contingency plan as part of its Plan. Water shortage contingency plan must include the analysis of water supply reliability conducted pursuant to Chapter 10635. • See Chapter 2.5 and Appendix 4. For Water Supply Reliability assessments • See Chapters 2.2, 2.3, and 2.4.
Water Code § 10632(a)(2) – Procedures Used to Conduct Annual Water Supply and Demand Assessment	Written decision-making process used each year to determine water supply reliability. Key data inputs and assessment methodology to evaluate water supply reliability for current year and one dry year, including: (i) current year unconstrained demand, (ii) current year available supply, (iii) existing infrastructure capabilities and plausible constraints, (iv) locally applicable evaluation criteria used for each annual water supply and demand assessment, and (v) description and quantification of each water supply source. • See Chapter 2.5 and Appendix 4.
Water Code § 10632(a)(3)(A) – Six Standard Water Shortage Levels	Six standard water shortage levels corresponding to ranges of up to 10, 20, 30, 40, and 50% shortages and greater than 50% shortage. Shortage levels shall be defined based on the suppliers' water supply conditions, including percentage reductions in water supply, changes in groundwater levels, changes in surface elevation or level of subsidence, or other changes in hydrological or other conditions indicative of available water supply. Shortage levels also apply to catastrophic interruption of water supplies, including regional power outage, earthquake, Delta levee failure, and aqueduct failure. • See discussion of Water Shortage Contingency Plan in Chapter 2.5 and Appendix 4, including description of Metropolitan's Water Surplus and Drought Management Plan and Water Supply Allocation Plan. • See discussion of Metropolitan's Emergency Storage Objective developed under its catastrophic supply interruption plan in Chapter 2.5 and Appendix 7. • See Appendix 4, DWR Submittal Tables 8-1, 8-2, and 8-3.

Summary of Compliance

Water Code § 10632(a)(4) – **Shortage Response Actions**	Shortage response actions that align with the shortage levels and include: (i) supply augmentation actions, (ii) demand reduction actions, (iii) operational changes, (iv) mandatory prohibitions against specific water use practices, and (v) estimated extent to which the gap between supplies and demand will be reduced by each action. • See discussion of Water Shortage Contingency Plan in Chapter 2.5 and Appendix 4, including description of Metropolitan's Water Surplus and Drought Management Plan and Water Supply Allocation Plan. • See discussion of Metropolitan's Emergency Storage Objective developed under its catastrophic supply interruption plan in Chapter 2.5 and Appendix 7. • See Appendix 4, DWR Submittal Tables 8-1, 8-2, and 8-3.
Water Code § 10632(a)(5) – **Communication Protocols and Procedures**	Communication protocols and procedures to inform customers, the public, interested parties, and governments regarding: (i) any current or predicted shortages, (ii) any shortage response actions triggered or expected to be triggered, and (iii) any other relevant communications. • See Chapter 2.5 and Appendix 4.
Water Code § 10632(a)(6) – Customer Compliance, Enforcement, Appeal, and Exemption Procedures	For an urban retail water supplier, customer compliance, enforcement, appeal, and exemption procedures for triggered shortage response actions. • Not applicable to Metropolitan as a wholesaler.
Water Code § 10632(a)(7) – **Legal Authorities**	Describe legal authorities that empower supplier to implement shortage response actions. Statement that supplier will declare a water shortage emergency in compliance with Chapter 3 (Water Code §§ 350-359 re Water Shortage Emergencies). Statement that supplier will coordinate with any city or county within which it supplies water supply services for the possible proclamation of a local emergency. • See Chapter 2.5 and Appendix 4.
Water Code § 10632(a)(8) – **Financial Consequences**	Describe financial consequences of and responses for drought conditions. Describe potential revenue reductions and expense increases associated with shortage response actions, and mitigation actions to address such reductions and increases. Describe cost of compliance with Chapter 3.3 (Water Code §§ 365-367 re Excessive Water Use During Drought). • See Chapter 2.5 on page 2-34, Chapter 2.7, and Appendix 4.
Water Code § 10632(a)(9) – Monitoring and Reporting Requirements and Procedures for Customer Compliance and State Reporting	For an urban retail water supplier, monitoring and reporting requirements and procedures for monitoring customer compliance and to meet state reporting requirements. • Not applicable to Metropolitan as a wholesaler.
Water Code § 10632(a)(10) – **Reevaluation and Improvement Procedures**	Reevaluation and improvement procedures for systematically monitoring and evaluating the functionality of the water shortage contingency plan. • See Chapter 2.5 and Appendix 4.
Water Code § 10632(b) – Water Features	Analyze and define water features artificially supplied with water separately from swimming pools and spas when developing water shortage contingency plan. • Not applicable to Metropolitan because prohibitions against specific water use practices are enforced on end users and are not within Metropolitan's authority as a wholesaler.

Summary of Compliance

Water Code § 10632(c) – Plan Availability	Water shortage contingency plan shall be available to customers and any city or county within which the supplier provides water supplies no later than 30 days after adoption of the plan. • Posting of water shortage contingency plan on Metropolitan's website and provision of water shortage contingency plan to cities and counties are described in Chapter 5.
Water Code § 10632.5 – Seismic Risk Assessment and Mitigation Plan	Include a seismic risk assessment and mitigation plan. • See Chapter 2.5 and Appendix 8.
Recycled Water Plan	
Water Code § 10633 – Recycled Water as Potential Water Source; Agency Coordination	Provide information, to the extent available, on recycled water and its potential as a water source in the supplier's service area. Coordinate plan preparation with local water, wastewater, groundwater, and planning agencies within supplier's service area. • See Chapter 1.4, Chapter 3.5, pages 3-68 through 3-82, Tables 3-12 and 3-14, Appendix 2, page A.2-9, and Appendix 5. • Coordination of the plan preparation is discussed in Chapter 5.
Water Code § 10633(a) – Wastewater System Description	Describe the wastewater collection and treatment systems in the supplier's service area. Quantify the volume of wastewater collected and treated. • Not applicable to Metropolitan because it does not collect or treat the wastewater generated within its service area. Instead, Metropolitan provides a general narrative description of the wastewater collection and treatment systems operated by others in its service area. • See Chapter 3.5, pages 3-68 through 3-83, Table 3-8 on page 3-70, Tables 3-12 and 3-13, Appendix 2, page A.2-9, and Appendix 5.
Water Code § 10633(a) through (d) – Wastewater Disposal and Recycled Water Uses	Describes methods of wastewater disposal in the supplier's service area. • Not applicable to Metropolitan because it does not dispose of wastewater within its service area. Instead, Metropolitan provides a general narrative description of wastewater disposal by others in its service area. • See Chapter 3.5, pages 3-68 through 3-83. Describe quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project. • Not applicable to Metropolitan because it does not treat or discharge recycled water. Instead, Metropolitan provides a general narrative description of the treatment and discharge of recycled water by others in its service area. • See Chapter 3.5, pages 3-68 through 3-83. Describe the current type, place and quantity of use of recycled water in supplier's service area. Describe and quantify potential uses of recycled water. Determination of technical and economic feasibility of serving the potential uses. • Not applicable to Metropolitan because it does not use recycled water in its service area. Instead, Metropolitan provides a general narrative description of the use of recycled water by others in its service area, including potential uses and the technical and economic feasibility of serving the potential uses of recycled water. • See Chapter 3.5, pages 3-68 through 3-83, Chapter 4, pages 4-7 through 4-8, Appendix 2, pages A.2-9 through A.2-10, and Appendix 5.

Summary of Compliance

Water Code § 10633(e) – Projected Uses of Recycled Water	Projected use of recycled water in service area at the end of 5, 10, 15, and 20 years. • See Chapter 2, Tables 2-1 through Table 2-3, pages 2-14 through 2-16 and Chapter 3.5. • See Appendix 11, DWR Submittal Table 6-5.
Water Code §§ 10633(f), (g) – Actions to Encourage Use of Recycled Water **Plan to Optimize Use of Recycled Water**	Describe actions, including financial incentives, that might be taken to encourage recycled water uses. Describe projected results of these actions in terms of acre-feet of recycled water used per year. Provide a plan to optimize the use of recycled water in the supplier's service area. • Metropolitan provides a general narrative description of the actions it takes to encourage recycled water uses in its service area. • See Chapter 1.4 on page 1-27, Table 1-5, Chapter 3.5, pages 3-68 through 3-83, Tables 3-12 on page 3-93, and Appendix 5.
Water Quality Impacts on Reliability	
Water Code § 10634 – Water Quality Impacts on Availability and Reliability of Supply	Discuss water quality of existing sources in 5-year increments to 20 years and how water quality affects water management strategies and supply reliability. • See Chapter 3.2, SWP Water Quality, pages 3-30 through 3-32. • See Chapter 4, Water Quality, pages 4-1 through 4-28.
Water Service Reliability	
Water Code § 10635(a) – Supply and Demand Comparison: Normal Water Year	Compare the projected normal water supply to projected normal water use over the next 20 years, in 5-year increments. • For projected water use, see Chapter 2, Table 2-1, page 2-14. • For projected water supply, see Chapter 2, Table 2-4, page 2-22 and Table A.3-7 in Appendix 3, pages A.3-65 through A.3-77, and Appendix 11, DWR Submittal Table 7-2.
Water Code § 10635(a) – Supply and Demand Comparison: Single-Dry Year Scenario	Compare the projected single-dry year water supply to projected single-dry year water use over the next 20 years, in 5-year increments. • For projected water use, see Chapter 2, Table 2-2, page 2-15. • For projected water supply, see Table 2-5, page 2-23 and Table A.3-7 in Appendix 3, pages A.3-65 through A.3-77.
Water Code § 10635(a) – Supply and Demand Comparison: 5-Year Drought Scenario	Compare the projected water supply during a drought lasting five consecutive water years to projected year water use during a drought lasting five consecutive water years over the next 20 years, in 5-year increments. • For projected water use, see Chapter 2, Table 2-3, page 2-16. • For projected water supply, see Table 2-6, page 2-24 and Table A.3-7 in Appendix 3, pages A.3-65 through A.3-77.
Water Code § 10635(b) – Drought Risk Assessment	Include a drought risk assessment for water service to customers as part of information considered in developing the demand management measures and water supply projects and programs to be included in the Plan. • See Chapter 2.4.
Water Code § 10635(b)(1) – Data, Methodology, and Basis	Describe the data, methodology, and basis for one or more supply shortage conditions that are necessary to conduct a drought risk assessment for a 5-year drought, starting from the year following when the assessment is conducted. • See Chapters 2.2 and 2.4, and Appendices 1 and 3, specifically Table A.3-8.

Summary of Compliance

Water Code § 10635(b)(2) – Reliability of Each Supply Source	Determine the reliability of each supply source under a variety of water shortage conditions. • See Chapter 2.3, specifically Tables 2-4, 2-5, and 2-6, and Appendix 3, specifically Tables A.3-7 and A.3-8.
Water Code § 10635(b)(3) – Comparison of Total Water Supply Sources to Total Projected Water Use	Compare the total water supply sources available with the total projected water use for the drought period. • See Chapter 2.3, specifically Tables 2-4, 2-5, and 2-6.
Water Code § 10635(b)(4) – Historical Drought Hydrology, Projected Supply and Demand Changes Due to Climate Change, Regulatory Changes, and Other Criteria	Consider historical drought hydrology, plausible changes on projected supplies and demands under climate change conditions, anticipated regulatory changes, and other locally applicable criteria. • See Chapters 1.4, 2.6, 4, and Appendices 1, 2, 3, and 6.
Water Code § 10635(c) – Plan Submittal to Cities and Counties	Supplier to provide portion of Plan on water service reliability to cities and counties within its service area no later than 60 days after Plan submittal. • Provision of Plan to cities and counties is described in Chapter 5.
Water Code § 10640 – Water Shortage Contingency Plan	Supplier to prepare a water shortage contingency plan pursuant to Chapter 10632, periodically review the water shortage contingency plan, and adopt any amendments or changes. • See Chapter 2.5 and Appendix 4.
Water Code § 10641 – Consultations with public agency, state agency or experts	Supplier may consult with and obtain comments from any public agency, state agency, or any person with special expertise as to water demand management methods and techniques. • Stakeholder, state agency, public agency, and expert participation, consultation, outreach, comments, and notification are described in Chapter 5.
Water Code § 10642 – Public Hearing; Notice; Adoption	Encourage involvement of diverse social, cultural & economic community groups prior to and during Plan and water shortage contingency plan preparation. • See Chapter 5, pages 5-1 through 5-11. Prior to adoption, Plan and water shortage contingency plan available for public inspection and hold public hearing. • See Chapter 5, pages 5-4 and 5-11. Provide proof of public hearing and notice. • See Chapter 5, page 5-10 through 5-11. Provide meeting notice to any city or county in service area • See Chapter 5, pages 5-7 and 5-10, and Appendix 11, DWR Submittal Table 10-1. Provide notice pursuant to Chapter 17.5 of the Government Code • See Chapter 5, pages 5-4 and 5-9. After hearing, Plan and water shortage contingency plan shall be adopted as prepared or as modified after hearing. • See Chapter 5, pages 5-4 and 5-13.

Summary of Compliance

Water Code §§ 10615, 10643 – Plan Implementation	Include in Plan strategy and time schedule for implementation. Implement Plan in accordance with the schedule set forth in the Plan. • Metropolitan has conducted a review of its planning progress through the 2020 IRP Update and CAMP4W, discussed in Chapter 2. In addition, in each Chapter, Metropolitan has included an "Achievement to Date" that discusses progress towards its planning goals, current issues, and potential challenges with continued implementation. • Chapter 3 summarizes the implementation plan and continued progress in developing a diversified resource mix consistent with the IRP to meet the region's water supply needs. Demand Management Measure Programs • Metropolitan's conservation plan and approach are discussed in Chapter 3.4. Individual conservation programs are discussed on pages 3-53 through 3-62.
Water Code § 10644(a)(1) –Plan Submittal	Submit to DWR, the California State Library, and any city or county within service area copy of Plan no later than 30 days after adoption. • Plan submission is described in Chapter 5.
Water Code § 10644(a)(2) – Plan shall include any Standardized Forms, Tables, or Displays specified by DWR	Submit Plan electronically. Include in Plan DWR's standardized forms, tables, or displays. • Plan submission is described in Chapter 5. • DWR's standardized tables for wholesale urban water agencies are completed and presented in Appendix 11.
Water Code § 10644(b) – Water Shortage Contingency Plan Revision	Submit copy of revised water shortage contingency plan to DWR no later than 30 days after adoption. • Plan submission is described in Chapter 5 and Appendix 4.
Water Code § 10645 – Plan and Water Shortage Contingency Plan Available for Public Review	No later than 30 days after plan submittal, the supplier and DWR to make the Plan and water shortage contingency plan available for public review during normal business hours. • Posting of Plan and water shortage contingency plan on Metropolitan's website for public review is described in Chapter 5.

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Executive Summary and Simple Lay Description of 2025 UWMP Findings

Metropolitan's 2025 Urban Water Management Plan (UWMP) has been prepared in compliance with the California Water Code (CWC).[1] This Executive Summary satisfies the requirement of CWC Section 10630.5 to include a simple lay description of information necessary to provide a general understanding of the plan, including a description of Metropolitan's reliable water, as well as its needs, strategies, and potential challenges for the foreseeable future.

This plan provides an assessment of Metropolitan's water service reliability, describes and evaluates sources of water supply, efficient uses of water, demand management measures, implementation strategy and schedule, and other relevant information and programs. In addition to the water reliability assessments, the plan includes an evaluation of frequent and severe periods of droughts, as described in the Drought Risk Assessment, and the preparation and adoption of the Water Shortage Contingency Plan (WSCP).

The information included in the 2025 UWMP represents the most current and available planning projections of supply capability and demand forecasts developed through a collaborative process with the member agencies.

As with Metropolitan's previous plans, the 2025 UWMP does not explicitly discuss specific activities undertaken by its member agencies unless they relate to one of Metropolitan's water demand or supply management programs. Presumably, each member agency will discuss these activities in its UWMP.

[1] This UWMP complies with the Urban Water Management Planning Act (Act), which was added by Statute 1983, Chapter 1009, became effective on January 1, 1984, and currently includes CWC Sections 10610 through 10657; and with CWC Section 10608.36 which was added by SB X7-7 in 2009.

Factors Considered for Metropolitan's Water Reliability Assessments for the UWMP

The Act requires reporting agencies to describe their water service reliability under the conditions associated with a normal water year, single dry year, and droughts lasting at least five consecutive water years, with projected information in five-year increments for 20 years. The factors used to evaluate Metropolitan's supply and demand balance for the 2025 UWMP are presented below. Some of the considerations and resulting projections may change as Metropolitan's planning progresses. These changes may be reflected in future updates of the UWMP. Metropolitan and its member agencies have engaged in a comprehensive regional planning process called the Integrated Water Resources Plan (IRP) since the 1990s. In its 2020 IRP Regional Needs Assessment process, Metropolitan and its member agencies adopted a scenario planning approach to identify and account for the broad range of uncertainty that the region faces in its water supplies and demands. Instead of focusing on a target for future water supply needs based on a single projected outcome of supplies and demands, this approach encouraged broader thinking and discussion of possible future conditions for local and imported water supply and retail demand, and the policy implications for Metropolitan and its service area. Adaptive management during implementation will allow flexibility in how the region prepares for the supply and demand conditions as they evolve through the future. In February 2023, Metropolitan's Board directed staff to integrate water resources, climate considerations, and financial planning into a comprehensive Climate Adaptation Master Plan for Water (CAMP4W), for the second phase of Metropolitan's long-term IRP planning process. CAMP4W incorporates the results and findings of the 2020 IRP Regional Needs Assessment into a collaborative process to identify and evaluate integrated regional solutions. The intent of CAMP4W is to translate the high-level portfolio analysis from the Regional Needs Assessment into guidance for specific policies, programs, and projects to address the findings and mitigate the potential shortages. The 2020 IRP scenarios and related reliability assessments were updated and reaffirmed for use in support of the CAMP4W process.

The UWMP, along with the original IRP and its subsequent updates, used a single set of assumptions for the uncertainties that drive supply and demands. In the 2020 IRP Regional Needs Assessment and CAMP4W, Metropolitan explicitly acknowledges that the future is unpredictable and that a scenario planning approach can better prepare Metropolitan's service area for the uncertainties that lie ahead. It is important to note that the UWMP assumptions fall within the plausible future scenarios contemplated in the 2020 IRP Regional Needs Assessment. This means that, while the reliability assessments in the UWMP comply with the Act, Metropolitan and its member agencies are contemplating and comparing future conditions that are beyond the requirements of the Act and thus will be prepared for a wider range of conditions than shown in the UWMP assessments.

Hydrologic Conditions and Reporting Period

The 2025 UWMP presents Metropolitan's water reliability assessments from 2030 through 2050. As specified in the Act, there are three water-year types that must be included in the water service reliability assessment for the UWMP. To simulate hydrologic conditions for the required reliability assessments, Metropolitan assumed the following:

- Normal Year – The average of historical years 1922 to 2021 most closely represents the water supply conditions that Metropolitan considers available during a normal water year.
- Single Dry Year – The conditions for the year 1977 represent the lowest total water supply available to Metropolitan.
- Five-Consecutive-Year Drought – The five consecutive years of 1988 to 1992 represent the driest five-consecutive year historical sequence for Metropolitan's water supply. This five-year sequence is used to complete both Metropolitan's water service reliability and drought risk assessments.

Metropolitan developed and evaluated estimates of future demands and supplies from local sources and from Metropolitan sources based on a record of 100 years (1922-2021) of historical hydrology. Supply and demand analyses for the single dry year and droughts lasting at least five consecutive water years were based on conditions affecting the watershed and supplies from the State Water Project (SWP), as this supply availability fluctuates the most among Metropolitan's sources of supply. Using the same 100-year period of the SWP supply availability, 1977 is determined to be the single driest year and 1988-1992 is the driest five-year historical sequence that represents the lowest water supply available for SWP supplies to Metropolitan. In addition, staff analysis of the 8-River Index, an indicator of river flow and runoff in the SWP watershed, indicated that 1977 is the single driest year and 1988-1992 is the lowest five consecutive dry years from 1922 through 2021. The 8-River Index is used by the California Department of Water Resources (DWR) and other water agencies as an estimate of the unimpaired runoff (or natural water production) of the Sacramento and San Joaquin River basins, which are sources of water for the SWP.

Demand Projections

Within Metropolitan's service area, retail water demands can be met with local supplies or imported supplies. In the UWMP, Metropolitan's supply reliability assessments focus on the future demands for Metropolitan's imported and other supplies. The expected firm demand on Metropolitan is the difference between total demands, adjusted for conservation, and projected total local supplies. Thus, in order to project the regional need for water, Metropolitan starts with a projection of total demand including retail Municipal and Industrial (M&I), retail agricultural, seawater barrier, and replenishment demands, determines the adjustments from total conservation, and subtracts the total local supplies that are available to meet a portion of those demands.

Total Demands

Demographic growth is a major driver of the current and future retail M&I water demand. Metropolitan updates its retail M&I projection periodically based on the release of official regional demographic and economic projections, and alternative demographic projections were evaluated for scenario planning in the 2020 IRP Regional Needs Assessment. The projections of retail M&I water demands used in the 2025 UWMP are based on demographic data and projections taken from the following reports:

- Southern California Association of Governments (SCAG) Connect SoCal 2024: The 2024-2050 Regional Transportation Plan/Sustainable Community Strategy of the

Southern California Association of Governments Demographics & Growth Forecast Technical Report (April 2024)

- San Diego Association of Governments (SANDAG) Draft 2025 Regional Plan (May 2025)

The SCAG and SANDAG regional growth forecasts are the core assumptions for the retail M&I demand forecasts for the UWMP assessments. These forecasts drive the estimating equations of the retail demand forecasting in Metropolitan's Econometric Demand Model (MWD-EDM). Both SCAG and SANDAG prepare demographic forecasts based on land use data for their respective regions through extensive processes that emphasize input from local planners and are done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. SCAG's and SANDAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are supported by Environmental Impact Reports.

Retail agricultural demands consist of retail-level water use for irrigating crops. Metropolitan's member agencies estimate agricultural water use based on factors, including farm acreage, crop types, historical water use, and land use conversion. Each member agency estimates its agricultural demands differently, depending on availability of information. Metropolitan relies on member agencies' estimates of agricultural demands for the 2025 UWMP.

Metropolitan also includes in its assessment of total demands the local groundwater requirements for seawater barrier and groundwater basin replenishment. Seawater barrier demands represent the amount of water needed to hold back seawater intrusion into the coastal groundwater basins. Replenishment demands represent the amount of water that member agencies plan to use to replenish the groundwater basins and augment natural replenishment from precipitation. Metropolitan relies on member agencies' and groundwater management agencies' projections for these demands, as well as projections of local supplies that are also used to meet these demands.

Total Conservation

Projected regional water demand is adjusted to account for water conserved by best management practices from active, code-based, and price-effect conservation. Active conservation levels are derived by calculating water savings from all active program device-based savings installed to date that are driven by water agencies providing financial incentives (rebates) for consumers to swap out water fixtures for more efficient ones. Code-based conservation levels are derived by calculating water savings from devices covered by existing plumbing codes, with replacement and new construction rates driven by demographic growth consistent with SCAG and SANDAG land use and transportation plans used to derive retail demand. Price-effect conservation is derived by calculating water savings by retail customers attributable to the effect of changes in the price of water.

Total Local Supplies

Projections of local supplies are based on information gathered from Metropolitan's annual local production surveys and communications between Metropolitan and member agency staff. The projections include groundwater and surface water production, recycled water

and recovery of contaminated or degraded groundwater (funded under the Metropolitan's Local Resources Program, as well as local agency-funded programs), and seawater desalination. The local supply projections presented in demand tables for the 2025 UWMP are consistent with the local supply projections reported in member agencies' UWMPs, with one variation being the Colorado River water the San Diego County Water Authority (SDCWA) exchanges with Metropolitan for deliveries of Metropolitan water.

Water Use Reduction Achievement in 2025

On November 10, 2009, the state Legislature passed Senate Bill 7 as part of the Seventh Extraordinary Session, referred to as SB X7-7 or the Water Conservation Act of 2009. This law was the water conservation component to the historic Delta legislative package and sought to achieve a 20 percent statewide reduction in urban per capita water use in California by December 31, 2020. According to CWC Section 10608.36, wholesale agencies are required to include in their UWMPs an assessment of present and proposed future measures, programs, and policies that would help achieve the water use reductions required under SB X7-7. Urban wholesale water suppliers are not required to comply with the target-setting and reporting requirements of SB X7-7.

As a wholesale water agency, Metropolitan is not required to establish or report on an urban water use reduction target. However, Metropolitan's regional conservation programs and local resource programs are designed to assist member agencies and retail water suppliers in the service area to comply with SB X7-7. Therefore, Metropolitan monitors the progress of its service area. Also, in compliance with SB X7-7, Metropolitan assesses its actions, programs, and policies to help achieve the water use reductions required by SB X7-7.

Based on an analysis of population, demand, and the methodologies for setting targets described in the legislation, Metropolitan's baseline potable per capita water use is 182 Gallons Per Capita per Day (GPCD), and the 2020 reduction target is 146 GPCD. The region met the target ahead of schedule, reaching 128 GPCD, and has sustained per capita use well below the 20x2020 target, reaching as low as 114 GPCD in 2023 and was 118 GPCD in 2024. Successful implementation of water use efficiency programs, drought response messaging, and the development of recycled water projects were essential in the region's success in meeting the target.

Supply Capabilities

The 2025 UWMP reports on Metropolitan's water reliability and identifies projected supplies to meet the long-term demand within its service area. For the 2025 UWMP reliability assessments, Metropolitan's supply capabilities are evaluated using the following assumptions for its imported supplies:

Colorado River Supplies

Colorado River supplies include Metropolitan's basic Colorado River apportionment, along with supplies that result from existing and committed programs, including those from the Imperial Irrigation District (IID)-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA (also a QSA-related agreement). The QSA established the baseline water use for each of the agreement parties and facilitates the transfer of water

from agricultural agencies to urban uses. Since the QSA, additional programs have been implemented to increase Metropolitan's supplies. These include the Palo Verde Irrigation District (PVID) Land Management, Crop Rotation, and Water Supply Program, as well as the Lower Colorado River Water Supply Project. The 2007 Interim Guidelines provided for the coordinated operation of Lake Powell and Lake Mead, as well as the Intentionally Created Surplus (ICS) program that allows Metropolitan to store water in Lake Mead. These stored supplies can be used to supply additional water to ensure that, when needed, Metropolitan can deliver up to the Colorado River Aqueduct (CRA) capacity of 1.25 million acre-feet. A detailed discussion of the QSA is included in Chapter 3.1 and Appendix 3.1.

In light of declining reservoir levels, the Lower Basin Drought Contingency Plan (DCP) was signed in 2019. This agreement incentivizes storage in Lake Mead and requires certain volumes of water be stored in Lake Mead under certain Lake Mead elevation levels through 2026. Metropolitan is to store certain volumes of water in Lake Mead as DCP ICS once Lake Mead is below elevation 1,045 feet. Although the DCP expires in 2026, the determination that California is not required to make DCP Contributions in 2026 has already been made as part of USBR's 2026 Annual Operating Plan, which was published prior to the publication of this UWMP. This agreement also increases Metropolitan's flexibility to take delivery of water stored as ICS at Lake Mead elevations below 1,075 feet. The goal of this agreement is to keep Lake Mead above critical elevations, and overall, it increases Metropolitan's flexibility to store water in Lake Mead in greater volumes and to take delivery of stored water to fill the CRA as needed.

The 2007 Interim Guidelines governing Lower Basin shortages and the operations of Lakes Mead and Powell are set to expire in 2026, and new operating guidelines will need to be developed for 2027 and beyond. At the time of this report, negotiations over the successor post-2026 guidelines are ongoing, and the outcome is highly uncertain. However, it is anticipated that California will likely be required to reduce its supplies from the Colorado River, on average, under the new guidelines, and as the junior priority, Metropolitan is at risk. A final Environmental Impact Statement with a Preferred Alternative is expected in the summer of 2026 with a record of decision to follow.

Colorado River supplies for the 2025 UWMP are modeled using the same primary logic as the United States Bureau of Reclamation's (USBR) Colorado River Simulation System (CRSS) model. For this reliability assessment, Metropolitan used the Lake Mead and Lake Powell inflows USBR included in its official August 2023 CRSS run, which is the latest available at the time of production of this plan. A moderate climate change factor was then applied that reduces Lake Mead and Lake Powell inflows through the life of the forecast. This climate change factor is equivalent to a 9.3 percent decrease in flows for every degree Celsius increase. This methodology was adopted during the 2020 IRP Regional Needs Assessment process, and the climate change impacts are consistent with the modeled impacts to SWP deliveries. The 2025 UWMP assumes continuation of current operating agreements through the planning horizon.

State Water Project Supplies

State Water Project supplies are estimated using the draft 2025 SWP Delivery Capability Report distributed by the California Department of Water Resources (DWR) in December 2025. The draft 2025 Delivery Capability Report presents the current DWR estimate of the

amount of water deliveries for current (2025) conditions and conditions 20 years in the future under DWR's set of stated assumptions and assuming currently existing SWP facilities. These estimates incorporate restrictions on SWP and Central Valley Project (CVP) operations in accordance with water quality objectives established by the State Water Resources Control Board, the biological opinions of the U.S. Fish and Wildlife Service issued on November 8, 2024, biological opinions of the National Marine Fisheries Service issued on December 6, 2024, and the Incidental Take Permit issued by the California Department of Fish and Wildlife on November 4, 2024. In addition, these estimates incorporate amendments to the Coordinated Operations Agreement between the CVP and the State Water Project made in 2018. Under the draft 2025 DCR—climate-adjusted current condition scenario—the delivery estimates for the SWP for 2025 conditions as a percentage of Table A amounts are 54 percent, equivalent to 1,034 thousand acre-feet (TAF) for Metropolitan under a long-term average condition, and five percent under a single dry-year (1977) condition, equivalent to 97 TAF for Metropolitan. Potential future projects and regulatory changes discussed elsewhere in this UWMP are provided for context and are not assumed in these delivery estimates unless explicitly noted.

In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs. Over the years, under the pumping restrictions of the SWP, Metropolitan has collaborated with the other contractors to develop numerous voluntary Central Valley/SWP storage and transfer programs. The goal of these storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

Storage

A key component of Metropolitan's water supply capability is the amount of water in Metropolitan's storage facilities. Storage is a major component of Metropolitan's dry-year and emergency resource management strategy. Metropolitan's likelihood of having adequate supply capability to meet projected demands, without implementing the Water Supply Allocation Plan (WSAP), depends on its storage resources. Metropolitan's WSCP also underscores the importance of storage as it is identified as one of potential shortage response actions at various water shortage levels.

In developing the supply capabilities for the 2025 UWMP, Metropolitan assumed the current (2025) storage levels at the start of simulation and used the median storage levels going into each of the five-year increments based on the balances of supplies and demands. Under the median storage condition, there is an estimated 50 percent probability that storage levels would be higher than the assumption used, and a 50 percent probability that storage levels would be lower than the assumption used. All storage capability figures shown in the 2025 UWMP reflect actual storage program conveyance constraints. It is important to note that under some conditions, Metropolitan may choose to implement the WSAP in order to preserve storage reserves for a future year, instead of using the full supply capability. This can result in impacts at the retail level even under conditions where there may be adequate supply capabilities to meet demands.

Findings of the 2025 Urban Water Management Plan

The 2025 UWMP provides an assessment and summary of Metropolitan's water service reliability outlook through 2050 under the assumptions and cited sources of information described above. As a reporting document, the UWMP will be updated every five years to reflect changes in water demand and supply projections.

The 2025 UWMP satisfies all the content and process requirements mandated by the Act, including the required collaboration for its planning initiatives and report preparation. It should be noted that Metropolitan's primary planning venue is its IRP and that the scenario planning approach within its 2020 IRP is intended to extend Metropolitan's planning beyond single scenario outcomes like that shown within this UWMP. The key findings of Metropolitan's 2025 UWMP are as follows:

Water Service Reliability and Projected Water Supplies

- Metropolitan has completed its water service reliability assessment, under the stated UWMP assumptions and conditions required by the Act and determined that it has supply capabilities sufficient to meet expected demands from 2030 through 2050 under a single dry-year condition and a period of drought lasting five consecutive water years, as presented in Figure ES-1, as well as in a normal water year hydrologic condition.
- Metropolitan has evaluated its water shortage risk under the stated UWMP assumptions and conditions required by the Act and determined that it has supply capabilities sufficient for a drought period that lasts five consecutive water years based on the driest five-year historical sequence for Metropolitan's water supply. This Drought Risk Assessment was completed starting from the year following when the assessment is conducted (2026 through 2030) and is presented in Figure ES-2.
- Metropolitan plans for supply implementation and continued development of a diversified resource portfolio including programs in the Colorado River, SWP, Central Valley storage and transfers programs, local resource projects, and in-region storage that position the region to meet its water supply needs.
- Metropolitan has developed comprehensive plans for stages of actions it would undertake to address frequent and severe periods of droughts; six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortage; and a catastrophic interruption in water supplies through its Water Shortage Contingency Plan, Water Surplus and Drought Management Plan (WSDM Plan).[2,3]
- Metropolitan continues to invest in measures that will help improve the region's water use efficiency over time.

[2] The WSDM Plan is a coordinated plan used to direct Metropolitan's resource operations to help attain the region's reliability goal recognizing the interdependence of surplus and shortage actions. The WSCP is consistent with the WSDM Plan. See Attachment A in Appendix 4.

[3] The WSAP is intended as an equitable approach for encouraging water use efficiency and minimizing regional impacts in times of shortage consistent with the principles and considerations approved by the Board through the 1999 WSDM Plan. See Attachment B in Appendix 4.

- Metropolitan continues to plan for emergency and catastrophic scenarios, with an Emergency Storage Objective to manage against potential interruption in water supplies resulting from catastrophic occurrences within the Southern California region, including seismic events along the San Andreas fault, and a Seismic Risk Assessment and Mitigation Plan to assess the vulnerability of Metropolitan's water system and mitigate those vulnerabilities. In addition, Metropolitan is working with the State on the Delta Risk Management Strategy to reduce the impacts of a seismic event in the Delta that would cause levee failure and disruption of SWP deliveries.
- A portion of Metropolitan's service area is highly dependent on SWP supplies and can only be delivered limited amounts of Colorado River supplies due to system constraints. Metropolitan is undertaking actions to improve operational flexibility and mitigate vulnerabilities with a Drought Mitigation Action Portfolio to recommend projects for implementation to provide timely relief to the SWP-dependent areas in the near term that do not require significant modifications of the existing infrastructure and identify potential mid-term projects that can be implemented after the removal of system constraints through projects currently in development. The portfolio provides alternative pathways to achieve long-term equitable supply reliability for the region through a balanced approach of infrastructure improvements, new storage and supply programs, and local supply development and demand management as directed by the Board.
- Metropolitan has and will continue to regard water quality with paramount importance to water supply reliability. Metropolitan owns and operates five water treatment plants, three of which are among the 10 largest in the world. Metropolitan is a national leader in providing safe drinking water that meets increasingly stringent standards, testing for over 400 constituents and performing nearly 250,000 water quality tests annually on samples gathered throughout its distribution system. Metropolitan's Water Quality Laboratory analyzes these samples to ensure that Metropolitan's delivered water meets or surpasses all state and federal drinking water standards. Because treatment to remove specific contaminants can be more costly than measures to protect water at the source, Metropolitan also actively supports improved watershed protection programs for its source waters in the Colorado River and State Water Project.

Challenges Ahead and Strategies for Managing Reliability Risks

- The Colorado River Basin has historically experienced large swings in annual hydrologic conditions. These swings have largely been buffered through a large volume of storage. However, a potential change in the precipitation to runoff relationship may be resulting in conditions in which less runoff is generated from a given level of precipitation, pushing the system toward a drying trend that is often characterized as a long-term drought. The current operational guidelines that govern operations on the Colorado River expire in 2026. Negotiations to determine operational guidelines to replace them remain ongoing and the outcome is highly uncertain. California will likely be required to reduce its supplies from the Colorado River, on average, under the new guidelines. As the junior priority water user, Metropolitan is at risk of reduced supplies.

- Dramatic swings in annual hydrologic conditions have impacted water supplies available from the State Water Project (SWP). Metropolitan's efforts in building dry-year storage reserves, water banking, and transfers have helped manage the wide swings in SWP allocations.
- With almost a third of Southern California's water supply transported across the Bay-Delta, its declining ecosystem has led to reduction in water supply deliveries. Operational constraints will likely continue until a long-term solution to the problems in the Bay-Delta is identified and implemented.
- Approximately half of the region's water supplies come from resources controlled or operated by local water agencies. These resources include water extracted from local groundwater basins, catchment of local surface water, non-Metropolitan imported water supplied through the Los Angeles Aqueduct, and Colorado River water exchanged for Metropolitan supplies.
- Invasive mussel infestations can adversely affect aquatic environments and render lakes more susceptible to harmful algae blooms. Quagga and golden mussels reproduce prolifically and, if not controlled, can impede operations by infesting critical infrastructure, including storage, pumping, conveyance, and water treatment facilities.
- Water quality challenges, such as algae toxins, per- and polyfluoroalkyl substances (PFAS), and the identification of constituents of emerging concern, have a significant impact on the region's water supply conditions and underscore the importance of flexible and adaptive regional planning strategies.

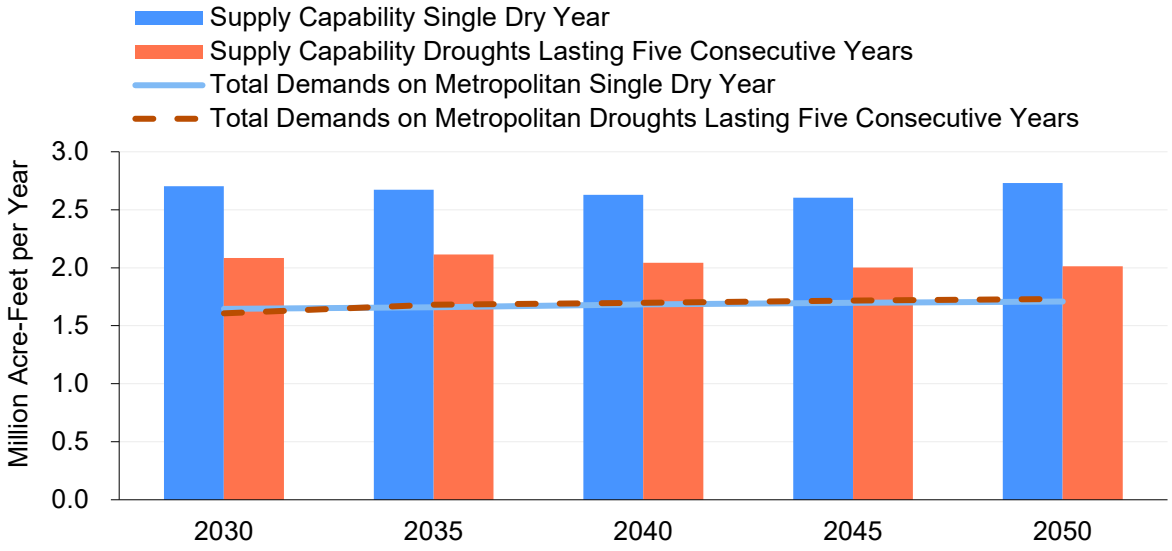
Metropolitan continues to address these water supply challenges through a variety of actions that will maintain water reliability within its service area. Metropolitan's proactive measures include:

- **Continuing water conservation** by expanding outreach, adding devices, and increasing incentives to residents,
- **Increasing local resources** by providing incentives for on-site recycled water hook-up and the Local Resources Program (LRP),
- **Augmenting water supplies** through water transfers and exchanges,
- **Improving return capability of storage programs** to effectively take delivery of water when needed,
- **Maintaining dry-year and emergency storage for the region** to remain reliable during periods of low supply and emergencies,
- **Modifying Metropolitan's distribution system** to enhance operational flexibility and efficient delivery of Colorado River, State Water Project, and in-region supplies within Metropolitan's service area,
- **Implementing shortage response actions** under the Water Shortage Contingency Plan and elements of the Water Surplus and Drought Management Plan and Water Supply Allocation Plan to distribute the limited imported supplies and preserve storage reserves,

- **Implementing an Invasive Mussel Control Plan** to protect critical infrastructure and operations, and
- **Responding to water quality concerns** by protecting the quality of the source water, developing water management programs that maintain and enhance water quality, and changing water treatment protocols or blending.

Chapters 1.4 and 2.6 offer detailed discussions and additional insight on Metropolitan's current challenges, current available resources, short-term supply outlook, other supply reliability risks, and recent and near-term actions to meet these challenges.

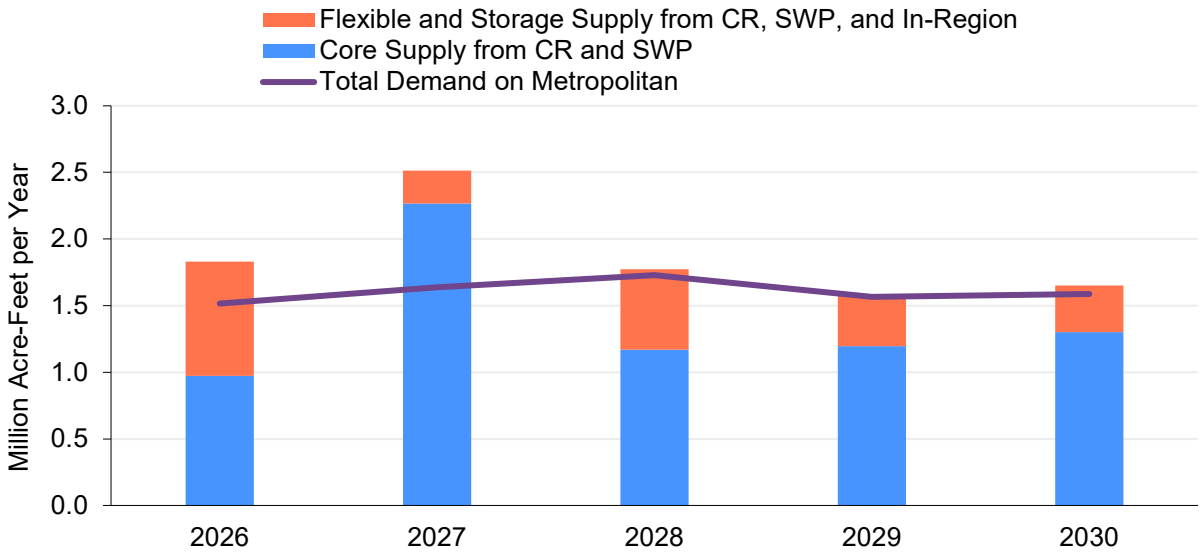
Figure ES-1: Supply Capabilities under Single Dry Year and Droughts Lasting Five Consecutive Years



Notes:

1. Supply capabilities are derived using the simulated median storage level going into each of the five-year increments based on the balances of supplies and demands. Under the median storage condition, there is an estimated 50 percent probability that storage levels would be higher than the assumption used, and a 50 percent probability that storage levels would be lower than the assumption used.
2. Under some conditions, Metropolitan may choose to implement the WSAP in order to preserve storage reserves for a future year, instead of using the full supply capability. This can result in impacts at the retail level even under conditions where there may be adequate supply capabilities to meet firm demands.
3. All storage capability figures shown in the 2025 UWMP reflect actual storage program conveyance constraints.
4. Total demands on Metropolitan, illustrated in the figure, include the delivery obligation associated with the Exchange with SDCWA.

Figure ES-2: Drought Risk Assessment for 2026-2030



Notes:

1. Drought risk assessment for 2026-2030 is based on historical 1988-1992 conditions (driest consecutive year historical sequence for Metropolitan's water supply).
2. Shortfall from core supplies may be met through supply augmentation actions by exercising Metropolitan's flexible supplies from Colorado River, State Water Project, and in-region storage.
3. As of the end of calendar year 2025, Metropolitan had 3.8 MAF of dry-year supplies that may be utilized to meet the shortfall from core supplies.
4. Metropolitan may also implement demand reduction and operational flexibility as part of its shortage response actions, if needed.
5. Total Demand on Metropolitan, illustrated in the figure, includes delivery obligations associated with Exchange with SDCWA.

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1 Introduction

1.1 Introduction to this Document and the Agency

Organization of this Document

Metropolitan's 2025 Urban Water Management Plan (UWMP) was prepared in compliance with California Water Code (CWC) Sections 10610 through 10657 of the Urban Water Management Planning Act (Act), which were added by Statute 1983, Chapter 1009 and became effective on January 1, 1984, and Section 10608.36 of SB X7-7, which was enacted in 2009.

This document contains five chapters and 11 appendices. The first chapter is the Introduction, which defines Metropolitan in terms of governance, structure, and current water supply status. This chapter also briefly outlines how Metropolitan will meet current and future challenges. The second chapter describes Metropolitan's planning activities and explains how the agency will manage the region's water resources to ensure a reliable water supply for the region. The third chapter describes the actions Metropolitan has taken to implement the plans outlined in Chapter 2 and lists future programs and activities. The fourth chapter addresses the issue of water quality and steps taken to deliver high-quality water to Metropolitan's service area. The fifth chapter details the public outreach component integrated with Metropolitan's planning processes. In addition, this document includes Appendices that contain supporting documents on the required and voluntary reporting elements. The chapters are further described in detail below:

Chapter 1 – Introduction

In addition to demonstrating how this report complies with the Act, the 2025 UWMP details Metropolitan's current situation and outlines its plan for meeting the challenges of the future. The Introduction chapter includes:

- Discussion of the Act and Metropolitan's reporting responsibilities under the Act;
- Introduction to Metropolitan and description of its formation, purpose, service area, current and projected land uses, member agencies, and governance;
- Historical, economic, and demographic information on Metropolitan's service area;
- Discussion of Metropolitan's current condition, challenges, and resource planning strategies; and
- Evaluation of Metropolitan's supply capabilities during a drought lasting five consecutive years.

Chapter 2 – Planning for the Future

The Planning for the Future chapter discusses how Metropolitan plans to meet Southern California's water needs in the future. The chapter highlights the importance of Integrated Water Resources Planning (IRP) and the Climate Adaptation Master Plan for Water (CAMP4W) by summarizing Metropolitan's planning processes over the years and emphasizes the need for Metropolitan to implement adaptive and multiple scenario planning strategies that will prepare the region to deal with uncertainties. This chapter also includes:

- Evaluation of regional water demand under a normal water year, single dry year, and droughts lasting at least five years, for years 2030 through 2050;
- Evaluation of supply capabilities under a normal water year, single dry year, and droughts lasting at least five consecutive water years, for years 2030 through 2050;
- Evaluation of frequent and severe periods of droughts, as described in the Drought Risk Assessment for years 2026 through 2030;
- Preparation and adoption of Water Shortage Contingency Plan (WSCP), including a discussion of Metropolitan's Emergency Storage Objective and Seismic Risk Assessment and Mitigation Plan;
- Discussion of other supply reliability risks including climate change; and
- Discussion of the different elements of Metropolitan's rate structure and revenue management.

Chapter 3 – Implementing the Plan

The Implementing the Plan chapter summarizes Metropolitan's progress in developing a diversified resource mix that enables the region to meet its water supply needs. The investments that Metropolitan has made and its continuing efforts in many different areas coalesce toward its goal of long-term supply reliability for the region. This chapter includes:

- Discussion of resources and program development for the Colorado River, State Water Project (SWP), Central Valley/SWP storage and transfers programs, conservation, local resources program (groundwater recovery, recycling, desalination), and groundwater; and
- Discussion of Metropolitan's measures, programs, and policies that were vital in achieving the SB X7-7 goal of 20 percent water use reduction by 2020 and in maintaining efficient water use after 2020.

Chapter 4 – Water Quality

The Water Quality chapter identifies key regional water quality issues and discusses the protection of the quality of source water and development of water management programs that maintain and enhance water quality. This chapter also includes:

- Discussion of water quality issues of concern, constituents of emerging concern, and water quality programs that Metropolitan has undertaken to protect its water supplies.

Chapter 5 – Coordination and Public Outreach

The Coordination and Public Outreach chapter presents the processes undertaken in the development of the 2025 UWMP and WSCP with the public and other stakeholders. It provides a list of all meetings and workshops conducted to promote and achieve consensus and collaborative planning. Included in this chapter are the public notification letters and announcements distributed by Metropolitan as required by the Act and copies of the Metropolitan resolutions adopting and approving the 2025 UWMP and WSCP for submittal to DWR.

Appendices

The appendices provide detailed background on the information presented in the 2025 UWMP.

Appendix 1 – Demand Forecast

Appendix 2 – Existing Regional Water Supplies

Appendix 3 – Justifications for Supply Projections

Appendix 4 – Water Shortage Contingency Plan

Appendix 5 – Local Supplies

Appendix 6 – Water Conservation Savings Estimates

Appendix 7 – Emergency Storage Objective

Appendix 8 – Seismic Risk Assessment and Mitigation Plan

Appendix 9 – Metropolitan's Energy Intensity Calculations, Including Conveyance and Distribution Generation

Appendix 10 – Quantifying Regional Self-Reliance and Reduced Reliance on Water Supplies from the Delta Watershed

Appendix 11 – DWR 2025 UWMP Submittal Tables

Urban Water Management Planning Act

This report has been prepared in compliance with Water Code Sections 10610 through 10657 of the Urban Water Management Planning Act (Act). This Act requires that "*every urban water supplier shall prepare and adopt an urban water management plan"* (Water Code § 10620(a)). An "urban water supplier" is defined as a supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually (Water Code § 10617). These plans must be filed with the California Department of Water Resources (DWR) every five years. The Act currently requires each urban supplier to update and submit its UWMP by July 1 in years ending in 6 and 1.

Changes in the Act Since 2020

There have been no new or changed requirements for urban wholesale water suppliers added to the Act since the 2020 UWMP. Additionally, there have been no substantive statutory changes to the Act since 2020 that would affect retailer or wholesale suppliers. However, DWR has provided minor revisions, clarifications, and updated guidance to its UWMP Guidebook, as described further below.

Senate Bill 7 of the Seventh Extraordinary Session of 2009, Water Conservation in the Delta Legislative Package.

The state Legislature passed Senate Bill 7 as part of the Seventh Extraordinary Session, referred to as SB X7-7, on November 10, 2009, which became effective February 3, 2010. This law was the water conservation component to the historic Delta legislative package and sought to achieve a 20 percent statewide reduction in urban per capita water use in California by December 31, 2020. This implements the Governor's similar 2008 water use reduction goals. The law required each urban retail water supplier to develop urban water use targets to help meet the 20 percent goal by 2020, and an interim urban water reduction target by 2015. The Water Code requires that retail suppliers report their progress in meeting the 2020 Target. The Water Code does not set an end date for reporting on this progress.

The bill stated that the legislative intent is to require all water suppliers to increase the efficiency of use of water resources and to establish a framework to meet the state targets for urban water conservation called for by the Governor. The bill established methods for urban retail water suppliers to determine targets to help achieve increased water use efficiency by the year 2020. The law was intended to promote urban water conservation standards consistent with the California Urban Water Conservation Council's adopted best management practices.

Urban wholesale water suppliers are not required to perform all of the target-setting and reporting requirements of SB X7-7. However, wholesale agencies must include in their UWMPs an assessment of present and proposed future measures, programs, and policies that would help achieve the water use reductions required under this law (Water Code § 10608.36).

Chapters 3.4, 3.5, and 3.7 of this plan address actions Metropolitan took to help urban retail water suppliers achieve the urban per capita water use reduction pursuant to the goals set forth in SB X7-7.

Metropolitan's Compliance with the Urban Water Management Planning Act

As with Metropolitan's previous plans, this Plan does not explicitly discuss specific activities undertaken by member agencies unless they relate to one of Metropolitan's water demand or supply management programs. Presumably, each member agency will discuss these activities in its Urban Water Management Plan, but elements of this Plan do not necessarily have to be adopted by the urban water suppliers or the public agencies directly providing retail water.

DWR Guidance

In February 2026, DWR released the final 2025 UWMP Guidebook for urban water suppliers (DWR Guidebook). The 2025 DWR Guidebook was updated from the 2020 version to improve clarity and provide additional guidance. Section 1.1 of the 2025 Guidebook summarizes the changes from the 2020 Guidebook. Excerpts from the 2025 Guidebook are shown below:

- **Changes in Water Code.** There have been minor changes to the Water Code since 2020 UWMPs were submitted; primarily, several definitions have been added. None of these change UWMP requirements for 2025 UWMPs.
- **Suppliers with Multiple Public Water Systems (PWSs).** For consistency among State agencies, DWR and the State Water Board are using the same criteria to determine when a Supplier with multiple PWSs is considered an Urban Water Supplier subject to UWMP requirements.
- **DWR Submittal Tables.** Submittal tables have been updated to reflect the current reporting year, improve accuracy of reporting, and more clearly identify information required by the Water Code and optional information.
- **Water Loss Standard Reporting.** There has been no change to the Water Code regarding water loss standard reporting since 2020 UWMPs were submitted. However, the existing Water Code requires Suppliers to demonstrate compliance with the 2028 Water Loss Standard. The Water Loss Standards were not available when the 2020 UWMPs were being submitted but are now available for 2025 UWMPs. Therefore, guidance has been added about how Suppliers can now report progress toward compliance with their Water Loss Standard in 2025 UWMPs.
- **Direct Potable Reuse.** The State Water Board has adopted regulations for the use of direct potable reuse (DPR) since 2020 UWMP reporting. To allow for reporting of DPR, minor changes have been made to supply and demand tables.
- **Lower-Income Housing.** While projections for lower-income housing were required in 2020 UWMPs, additional guidance has been provided for optional reporting of the method used to project water use for lower-income housing. This optional guidance incorporates RHNA into projected land and water uses.
- **Reporting Groundwater Recharge and Other Water Storage.** In previous years, the guidance for reporting water placed into storage did not differentiate between long-term storage (i.e., water placed into storage one year but extracted in a future year) and short-term storage (i.e., water that is placed into storage and extracted the same year). When a Supplier reports water placed into storage and then reports it was retrieved in the same year (short-term storage) it can cause a double-counting error.

1.2 The Metropolitan Water District of Southern California

Formation and Purpose

The Metropolitan Water District of Southern California (Metropolitan) is a public agency organized in 1928 by a vote of the electorates of 13 Southern California cities. The agency was enabled by the adoption of the original Metropolitan Water District Act (MWD Act) by the California Legislature "for the purpose of developing, storing and distributing water for domestic purposes." The MWD Act also allows Metropolitan to sell “surplus water not needed or required for domestic or municipal uses within the district for beneficial purposes.” In 1992, the Metropolitan Board of Directors adopted the following mission statement:

> *"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."*

The first function of Metropolitan was building the Colorado River Aqueduct (CRA) to convey water from the Colorado River. Deliveries through the aqueduct to member agencies began in 1941 and supplemented the local water supplies of the Southern California member cities. In 1960, to meet growing water demands in its service area, Metropolitan contracted for participation in the State Water Project (SWP), which is owned and operated by DWR and would deliver additional water supplies via the California Aqueduct. SWP deliveries began in 1972. Metropolitan currently receives imported water from both of these sources: (1) Colorado River water via the CRA, and (2) the SWP via the California Aqueduct.

Service Area

Metropolitan’s service area covers the Southern California coastal plain. It extends about 200 miles along the Pacific Ocean from the city of Oxnard on the north to the international boundary with Mexico on the south, and it reaches as far as 70 miles inland from the coast (Figure 1-1). The total area served is approximately 5,200 square miles, and it includes portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Table 1-1 shows that although only 14 percent of the land area of the six Southern California counties is within Metropolitan's service area, approximately 86 percent of the populations of those counties reside within Metropolitan's boundaries.

Member Agencies

Metropolitan is a voluntary cooperative of member agencies. Currently, it is composed of 26 member agencies, including 14 cities, 11 municipal water districts, and one county water authority. Metropolitan is a water wholesaler with no retail customers. It provides treated and untreated water only to its member agencies.

Metropolitan's 26 member agencies deliver to their customers a combination of local groundwater, local surface water, recycled water, and imported water purchased from or exchanged with Metropolitan. For some member agencies, Metropolitan supplies most of the water used within that agency's service area, while others obtain varying amounts of water from Metropolitan to supplement local supplies. Between 2015 and 2024, Metropolitan has provided between 39 and 53 percent of the municipal, industrial, and

agricultural water used in its service area. The remaining water supply comes from local wells, local surface water, recycling, and the city of Los Angeles' aqueducts from the Owens Valley/Mono Basin east of the Sierra Nevada. Member agencies also implement conservation and other programs that can be considered part of their supplies.

Some member agencies provide retail water service, while others provide water to the local area as wholesalers. Table 1-2 shows Metropolitan's member agencies and the type of service that they provide. As shown in the table, 15 member agencies provide retail service to customers, nine provide only wholesale service, and two provide a combination of both. Throughout Metropolitan's service area, approximately 250 retail water suppliers directly serve the population.

Metropolitan's member agencies serve residents in many cities and unincorporated communities throughout Southern California. Table 1-3 shows the member agencies of Metropolitan, as well as the cities and communities served by those member agencies. Figure 1-1 also shows the geographical area served by the member agencies.

Currently, member agencies receive water from Metropolitan at various delivery points and pay for service through a rate structure made up of multiple components. The majority of these components consist of uniform volumetric rates, and the majority of the revenue is collected through these volumetric rates. Metropolitan's rate structure is described in detail in Chapter 2.7.

To aid in planning future water needs, member agencies advise Metropolitan in July of each year of how much water they anticipate they will need during the next five years. In addition, Metropolitan works with its member agencies to forecast future water demands.

Table 1-1
January 1, 2025, Area and Population in the Six Counties of Metropolitan's Service Area

County	Total County	In Metropolitan Service Area	Percent in Metropolitan
Land Area (Square Miles)			
Los Angeles County	4,085	1,399	34%
Orange County	796	698	88%
Riverside County	7,303	1,077	15%
San Bernardino County	20,105	239	1%
San Diego County	4,236	1,436	34%
Ventura County	1,855	371	20%
Metropolitan's Service Area	**38,380**	**5,221**	**14%**
Population (Persons)			
Los Angeles County	9,877,000	8,988,000	91%
Orange County	3,175,000	3,175,000	100%
Riverside County	2,496,000	1,949,000	78%
San Bernardino County	2,207,000	876,000	40%
San Diego County	3,330,000	3,186,000	96%
Ventura County	829,000	620,000	75%
Metropolitan's Service Area	**21,914,000**	**18,794,000**	**86%**

Source: State of California, Department of Finance, E-5 County/State Population and Housing Estimates - May 2025 release.

Table 1-2
Metropolitan's Member Agencies and Type of Water Service Provided

Member Agency	Retail or Wholesale
Los Angeles County	
Beverly Hills, City of	Retail
Burbank, City of	Retail
Central Basin Municipal Water District	Wholesale
Compton, City of	Retail
Foothill Municipal Water District	Wholesale
Glendale, City of	Retail
Las Virgenes Municipal Water District	Retail
Long Beach, City of	Retail
Los Angeles, City of	Retail
Pasadena, City of	Retail
San Fernando, City of	Retail
San Marino, City of	Retail
Santa Monica, City of	Retail
Three Valleys Municipal Water District	Wholesale
Torrance, City of	Retail
Upper San Gabriel Valley Municipal Water District	Wholesale
West Basin Municipal Water District	Wholesale
Orange County	
Anaheim, City of	Retail
Fullerton, City of	Retail
Municipal Water District of Orange County	Wholesale
Santa Ana, City of	Retail
Riverside County	
Eastern Municipal Water District	Retail & Wholesale
Western Municipal Water District	Retail & Wholesale
San Bernardino County	
Inland Empire Utilities Agency	Wholesale
San Diego County	
Eastern Municipal Water District	Wholesale
San Diego County Water Authority	Wholesale
Ventura County	
Calleguas Municipal Water District	Wholesale

Table 1-3
Member Agencies

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Municipal Water Districts (11)

Calleguas
Central Basin
Foothill
Inland Empire
Eastern
Las Virgenes
Orange County
Three Valleys
Upper San Gabriel Valley
West Basin
Western

Member Cities (14)

Anaheim
Beverly Hills
Burbank
Compton
Fullerton
Glendale
Long Beach
Los Angeles
Pasadena
San Fernando
San Marino
Santa Ana
Santa Monica
Torrance

County Water Authorities (1)

San Diego

Calleguas MWD
Bell Canyon
Camarillo
Camarillo Estates
Camarillo Heights
Fairview
Lake Sherwood
Las Posas Valley
Moorpark
Naval Base Ventura County
Newbury Park
Oak Park
Oxnard
Port Hueneme
Santa Rosa Valley
Simi Valley
Somis
Thousand Oaks

Central Basin MWD
Artesia
Bell
Bellflower
Bell Gardens
Carson
Cerritos
Commerce
Compton
Cudahy
Downey
East Los Angeles
Florence-Graham
Hawaiian Gardens
Huntington Park
La Habra Heights
Lakewood
La Mirada
Los Nietos
Lynwood
Maywood
Montebello
Monterey Park
Norwalk
Paramount
Pico Rivera
Santa Fe Springs
Signal Hill
South Gate
South Whittier
Vernon
Walnut Park
West Whittier
Whittier
Willowbrook

Foothill MWD
Altadena
La Cañada Flintridge
La Crescenta
Montrose

Inland Empire Utilities Agency
Chino
Chino Hills
Fontana
Montclair
Ontario
Rancho Cucamonga
Upland

Eastern MWD
Fallbrook
French Valley
Good Hope
Hemet
Homeland
Juniper Flats
Lakeview
Mead Valley
Menifee
Moreno Valley
Murrieta
Murrieta Hot Springs
Nuevo
North Canyon Lake
Perris
Quail Valley
Rainbow
Romoland
San Jacinto
Sun City
Temecula
Valle Vista
Winchester

Las Virgenes MWD
Agoura
Agoura Hills
Calabasas
Chatsworth
Hidden Hills
Lake Manor
Malibou Lake
Monte Nido
Westlake Village
West Hills

MWD of Orange County
Aliso Viejo
Brea
Buena Park
Capistrano Beach
Corona Del Mar
Costa Mesa
Coto De Caza
Cypress
Dana Point
Emerald Bay
Fountain Valley
Garden Grove
Huntington Beach
Irvine
Laguna Beach
Laguna Hills
Laguna Niguel
Laguna Woods
La Habra
La Palma
Ladera Ranch
Lake Forest
Las Flores
Los Alamitos
Midway City
Mission Viejo
Modjeska
Monarch Beach
Newport Beach
North Tustin
Orange
Placentia
Rancho Santa Margarita
Rossmoor

MWD of Orange County (cont.)
San Clemente
San Juan Capistrano
Seal Beach
Silverado
Stanton
Trabuco Canyon
Tustin
Tustin Foothills
Villa Park
Westminster
Williams Canyon
Yorba Linda

Three Valleys MWD
Azusa
Charter Oak
Claremont
Covina
Covina Hills
Diamond Bar
Glendora
Industry
La Verne
Pomona
Rowland Heights
San Dimas
South San Jose Hills
Walnut
West Covina

Upper San Gabriel Valley MWD
Arcadia
Avocado Heights
Azusa
Baldwin Park
Bassett
Bradbury
Covina
Duarte
El Monte
Glendora
Hacienda Heights
Industry
Irwindale
La Puente
Monrovia
North Whittier
Rosemead
San Gabriel
South El Monte
South Pasadena
South San Gabriel
Spy Glass Hill
Temple City
Valinda
West Covina

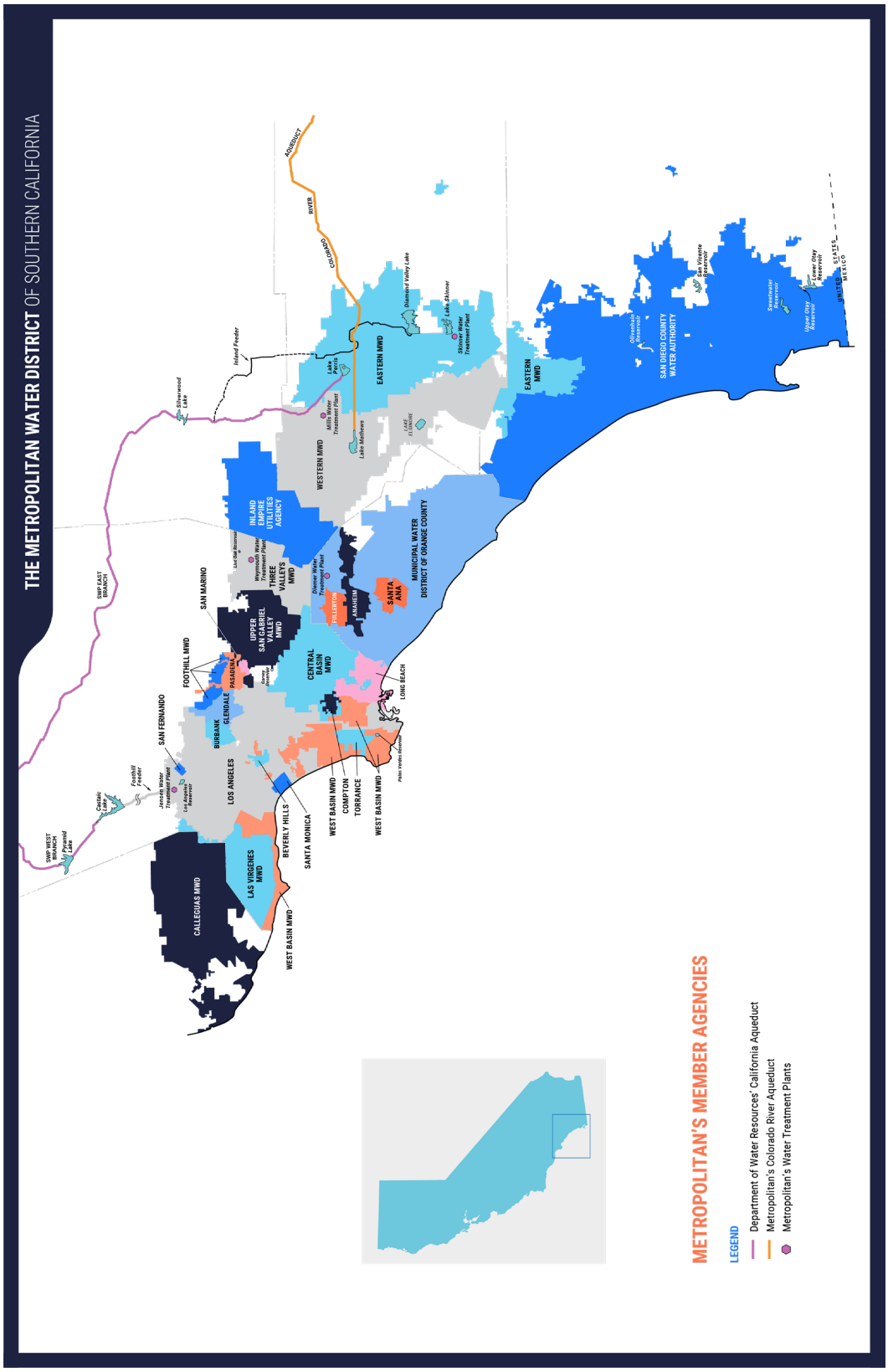
West Basin MWD
Carson
Culver City
Del Aire
El Camino Village
El Segundo
Gardena
Hawthorne
Hermosa Beach
Inglewood
Ladera Heights
Lawndale
Lennox

West Basin MWD (cont.)
Lomita
Malibu
Manhattan Beach
Marina Del Rey
Palos Verdes Estates
Rancho Dominguez
Rancho Palos Verdes
Redondo Beach
Rolling Hills
Rolling Hills Estates
Topanga
Torrance
View Park-Windsor Hills
West Athens
West Hollywood
Westmont
Wiseburn

Western MWD
Box Springs
Canyon Lake
Corona
Eagle Valley
Eastvale
El Sobrante
Elsinore
Jurupa
Lake Elsinore
Lake Mathews
Lee Lake
March Air Reserve Base
Murrieta
Norco
Perris
Rainbow
Riverside
Rubidoux
Temecula
Temescal Canyon
Woodcrest

San Diego CWA
Alpine
Bonita
Bonsall
Camp Pendleton
Carlsbad
Chula Vista
Del Mar
El Cajon
Encinitas
Escondido
Jamul
Lakeside
La Mesa
Lemon Grove
Leucadia
Mount Helix
National City
Oceanside
Pauma Valley
Poway
Ramona
Rancho San Diego
Rancho Santa Fe
San Diego
San Marcos
Santee
Solana Beach
Spring Valley
Valley Center
Vista

Figure 1-1
Metropolitan Service Area



Board of Directors and Management Team

Metropolitan's Board of Directors currently consists of 38 directors. The Board consists of at least one representative from each member agency, with each agency's assessed valuation determining its additional representation and voting rights. Directors can be appointed by the chief executive officer of the member agency or be elected by a majority vote of the governing body of the agency. Metropolitan does not compensate directors for their service. The Board includes business, professional, and civic leaders. Board meetings are generally held on the second Tuesday of each month and are open to the public.

Throughout its history, the Board has delegated certain tasks to Metropolitan staff, which are codified in Metropolitan's Administrative Code. In addition, Metropolitan has developed policy principles to help achieve its mission to provide adequate and reliable supplies of high-quality water in an environmentally and economically responsible way. These policies can be found in a variety of documents including: specific policy statements, the Administrative Code, board-adopted policy principles, and letters submitted to the Board. Policy statements are also embedded in formal Board meeting discussions and recorded in meeting minutes. The policies established by the Board are subject to all applicable laws and regulations. The management of Metropolitan is under the direction of its General Manager, who serves at the discretion of the Board, as do Metropolitan's General Auditor, General Counsel, and Ethics Officer.

1.3 Metropolitan Service Area Historical Information

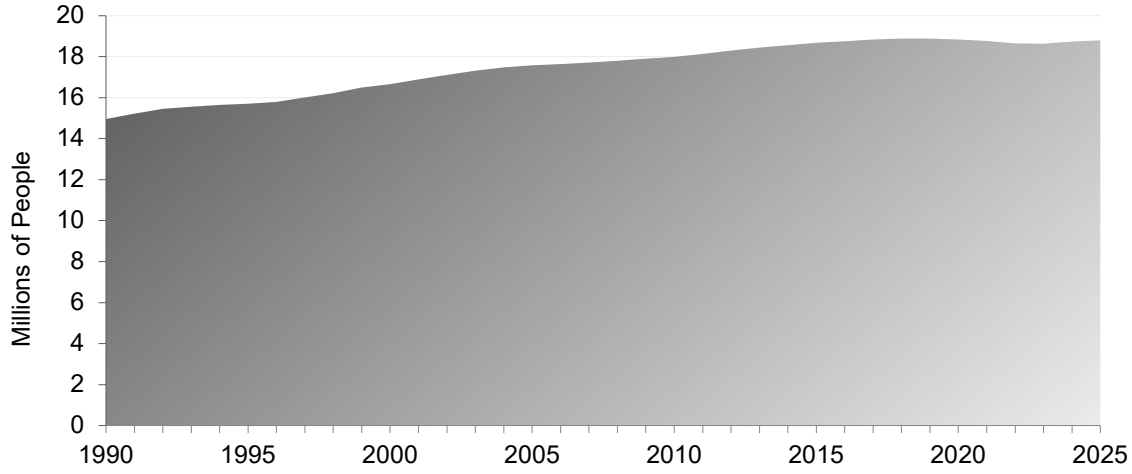
Population

In 1990, the population of Metropolitan's service area was approximately 15 million people. By 2025, it had reached an estimated 18.8 million, representing almost half of the state's population. In the past, annual growth has varied from about 200,000 annually in the 1970s and early-to-mid-1980s to more than 330,000 annually in the late 1980s. Population growth slowed due to economic recession during the early 1990s to just under 70,000 in 1995, before rising again to more than 250,000 per year from 1999 to 2002. Growth has generally averaged 111,000 persons per year from 2011 to 2018. The service area population experienced a net decline between 2019 and 2023 and a net increase in 2024. This temporary decline was exacerbated by the COVID-19 pandemic. Figure 1-2 shows the service area population growth from 1990 to 2025.

The most populated cities within Metropolitan's service area are Los Angeles (largest city in the state), San Diego (second largest in the state), Long Beach, Anaheim, Santa Ana, and Riverside. Figure 1-3 shows the five-year growth rates for the six counties within Metropolitan's service area. As shown in this figure, there has been an overall decrease in population growth rate in the last five years. Most notably, Orange and San Diego counties experienced no significant growth. Appendix 1 presents a detailed discussion of the demographic trends in Southern California and their impacts on regional demand forecasts.

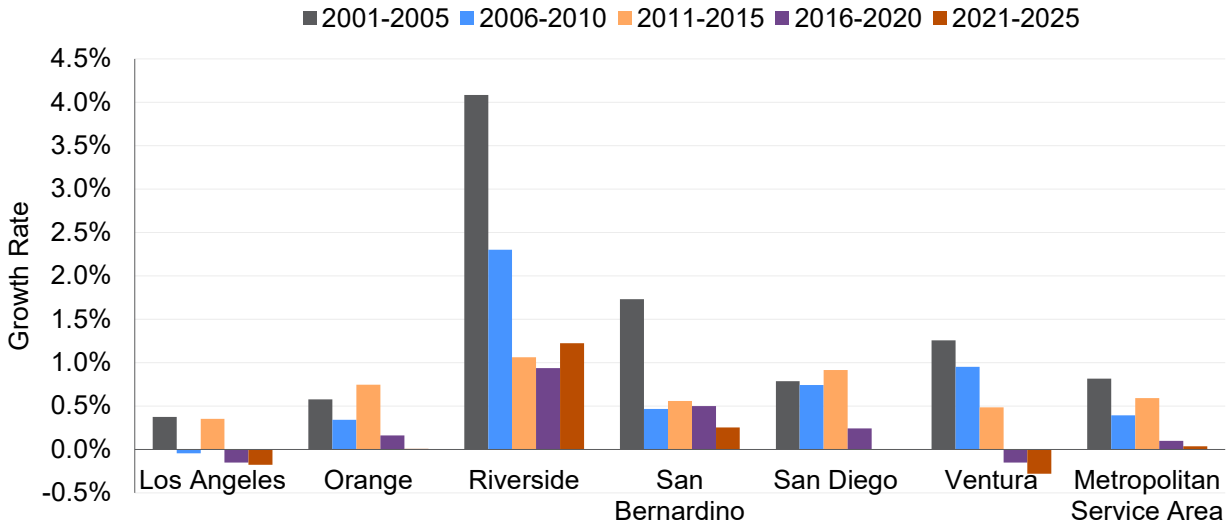
In preparing its demographic and economic growth forecast, Metropolitan relied on the Southern California Association of Government's (SCAG) Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) 2024 and San Diego Association of Government's (SANDAG) 2025 Regional Plan Series 15. The regional plans include information on population, such as age, race, and take into account current and projected land uses. As noted in the SCAG's and SANDAG's reports, Southern California is one of the most diverse regions in the nation in race and ethnicity. In addition, the plans also considered economic factors, in particular high cost of living due to housing shortages.

Figure 1-2
Service Area Population Growth



Source: U.S. Census, California Department of Finance, and Metropolitan

Figure 1-3
Average Annual Population Growth Rates in Southern California



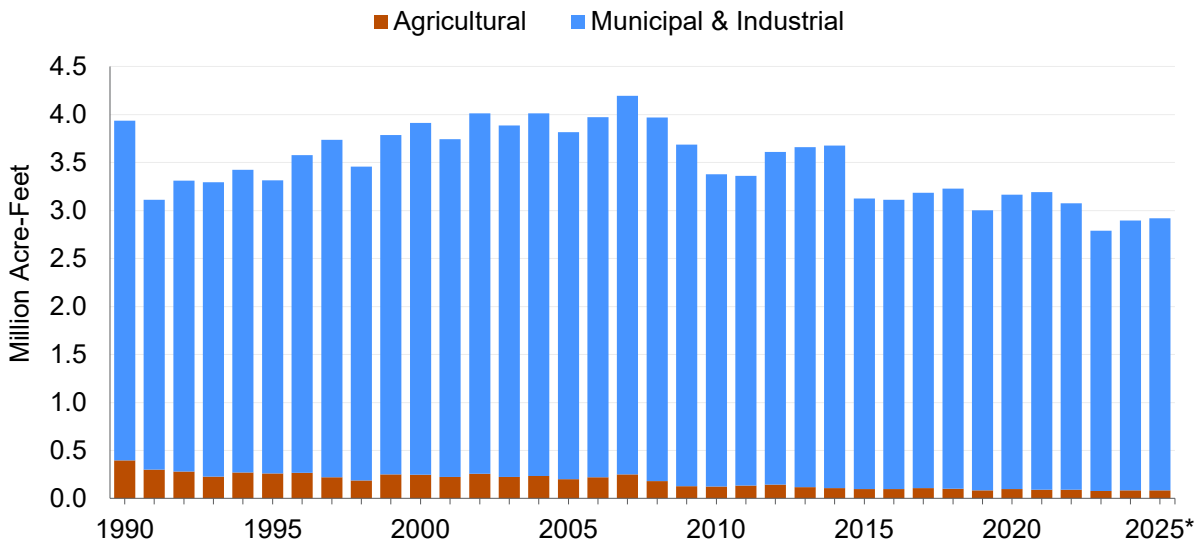
Source: California Department of Finance

Historical Retail Water Demands

Figure 1-4 presents historical retail water demands in Metropolitan's service area on a calendar year basis. Since 1990, retail water demands varied from 2.9 million acre-feet (MAF) in 1983 to a historic 4.2 MAF in 2007. Record drought years in the late 1980s coincided with water demand reaching nearly 3.9 MAF in 1990. Subsequently, demands declined to 3.1 MAF in 1991 because of economic recession, drought impacts, conservation, and mandatory water use restrictions. Demand remained below the historic peak level as a result of continuing effects from the recession and the drought, coupled with a number of wet years and ongoing conservation efforts. In 2000, retail demands once again reached 3.9 MAF. Since 2000, retail demands reached a new peak level in 2007 at nearly 4.2 MAF. Calendar year 2007 was the driest year since 1989, with 4.56 inches of precipitation measured in Downtown Los Angeles. Since the peak retail demand in 2007, a decrease in demand was observed during the economic recession of 2008-2012. A multi-year drought starting in 2012 led to a massive conservation campaign and water use restrictions by the state, Metropolitan, and local water agencies, which resulted in a decrease in demand in 2015. Aided by the Water Conservation Act of 2009 (SBx7-7) that set a target for retail water suppliers to reduce water consumption by 20 percent by 2020, demands remained low even after mandatory drought restrictions were lifted in the spring of 2017.

In 2024, about 97 percent of retail demands were used for municipal and industrial purposes (M&I), and three percent for agricultural purposes. The relative share of agricultural water use has declined due to urbanization and market factors, including the price of water. Agricultural water use accounted for ten percent of total regional water demand in 1990, six percent in 2000, and four percent in 2010.

Figure 1-4
Retail Demand in Metropolitan's Service Area



*2025 data unavailable during the preparation of the report and were estimated based on historical trends.

Climate and Rainfall

As Figure 1-5 shows, Metropolitan's service area encompasses predominantly mediterranean, semi-arid, and desert climates. Table 1-4 reports the average temperature and rainfall information for representative locations within those three zones for the 30-year period from 1995 to 2024. The evapotranspiration data (expressed as Et_o) are derived from DWR's Model Water Efficient Landscape Ordinance Appendix C, which aggregates the monthly averages of the Spatial California Irrigation Management Information System (CIMIS) for the 2004-2021 period for the representative counties within the three zones.

Figure 1-5
Climate Zones in Southern California

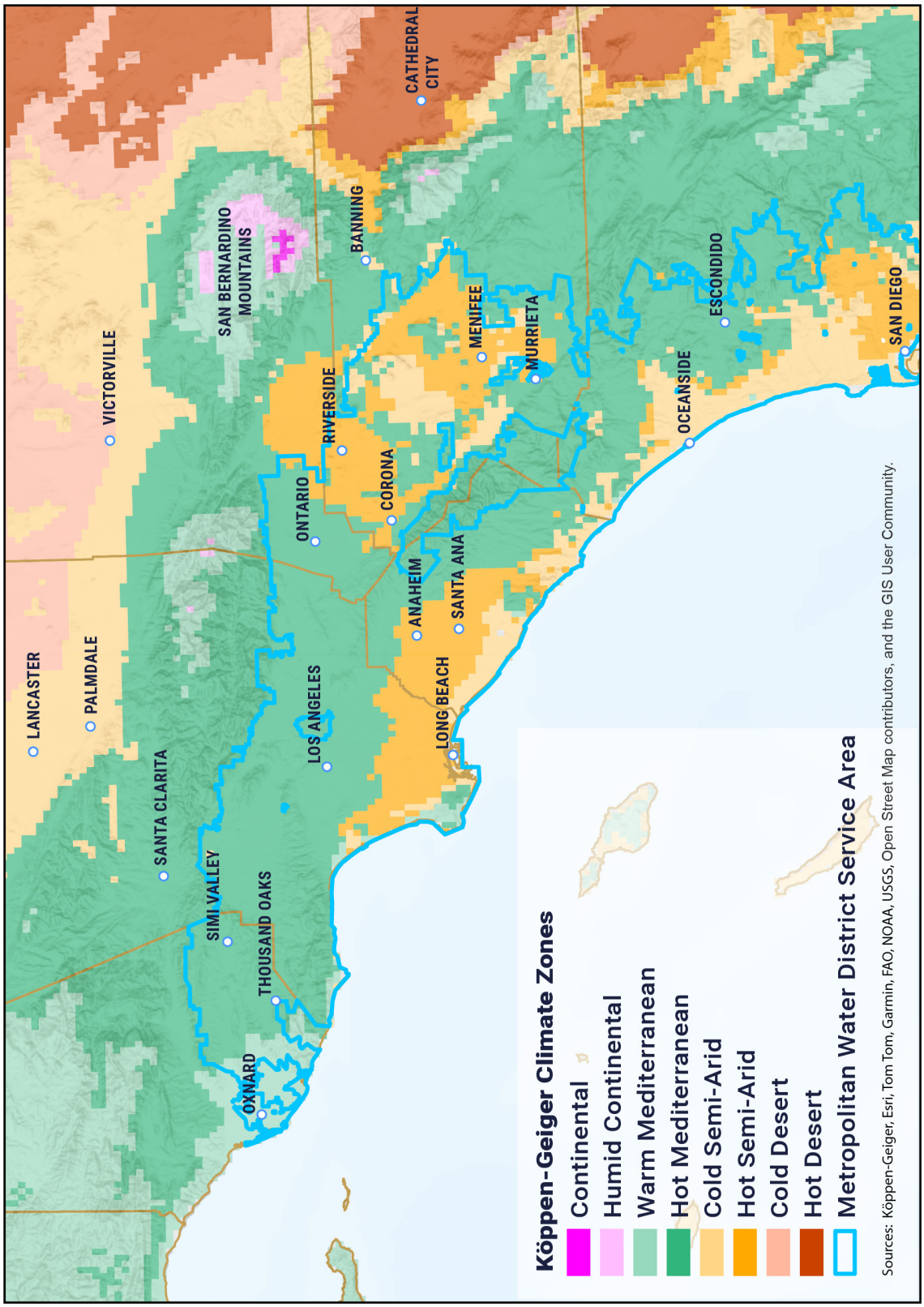


Table 1-4
Weather Variables in Three Zones in Metropolitan's Service Area

30-year Average (1995-2024)

Highest Average Temperature	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Los Angeles[1]	68.0	68.8	70.9	75.2	74.8	76.5	81.3	82.1	85.3	79.7	73.6	67.0	75.3
Riverside[2]	66.1	66.5	69.7	74.7	78.0	82.8	87.7	88.8	88.7	80.4	72.0	65.8	76.8
San Diego[3]	65.3	66.2	67.8	70.8	70.5	72.2	76.0	77.5	80.3	75.4	71.0	64.4	71.5

30-year Average (1995-2024)

Average Precipitation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Los Angeles[1]	3.25	3.53	2.11	0.68	0.33	0.06	0.02	0.10	0.14	0.56	0.82	2.65	14.25
Riverside[2]	1.82	2.16	1.26	0.47	0.18	0.05	0.12	0.12	0.12	0.37	0.65	1.47	8.79
San Diego[3]	1.92	1.99	1.24	0.62	0.28	0.03	0.07	0.07	0.15	0.50	0.80	1.64	9.31

Reference Evapotranspiration (2004-2021)

Et_o[4]	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Los Angeles County	2.5	2.6	3.8	4.6	5.4	6.0	6.8	6.3	5.1	3.8	2.7	2.1	51.6
Riverside County	2.5	2.9	4.6	5.8	7.1	8.1	8.6	7.9	6.3	4.5	3.0	2.2	63.5
San Diego County	2.4	2.7	4.0	4.9	5.7	6.3	6.8	6.4	5.3	4.0	2.8	2.1	53.3

1. Temperature and precipitation data are from the National Oceanic and Atmospheric Administration. Data queried for Jan 1995 - Dec 2024 for 'Los Angeles Downtown'. Last updated June 2025.
2. Temperature and precipitation data are from the National Oceanic and Atmospheric Administration. Data queried for Jan 1995 - Dec 2024 for 'Riverside Area'. Last updated June 2025.
3. Temperature and precipitation data are from the National Oceanic and Atmospheric Administration. Data queried for Jan 1995 - Dec 2024 for 'San Diego International Airport'. Last updated June 2025.
4. Eto values are from the Model Water Efficiency Landscape Ordinance (MWELO), which aggregated Spatial California Irrigation Management Information System (CIMIS) data for the 2004-2021 period.

1.4 Current Conditions

Current Challenges

Metropolitan faces a number of challenges in providing adequate, reliable, and high-quality supplemental water supplies for Southern California. One of those challenges is widely variable hydrologic conditions that can have a significant impact on Metropolitan's imported water supply sources. This chapter offers a brief discussion of Metropolitan's current challenges, current available resources, short-term supply outlook, and recent and near-term actions to meet these challenges.

Dramatic swings in annual hydrologic conditions have characterized the past decade on the State Water Project (SWP). 2014 saw the lowest allocation of contract supplies from the SWP up to that point, and 2015 saw the lowest ever Northern Sierra snowpack. Just two years later in 2017, the SWP watershed experienced the highest-ever Sacramento River runoff. Wet conditions returned in 2019, helping Metropolitan to rebuild dry-year storage reserves. Beginning in the fall of 2019, the SWP watersheds received very low precipitation and runoff. SWP Table A allocations for 2020, 2021, and 2022 were only 20, five, and five percent, respectively. Despite substantial precipitation in late 2021, precipitation in Northern California from January through March 2022 fell to the driest levels on record. In 2022, for the first time in history, DWR used a provision of the SWP Contract to allocate water on a basis other than Table A to meet minimum demands of contractors for human health and safety needs. Despite a low initial allocation for 2023, the extraordinary wet conditions at the end of 2022 into the beginning of 2023 allowed for the 2023 allocation to rise to 100 percent, the highest SWP allocation since 2006. In 2024 and 2025, the SWP watersheds received above-average snowpack, as well as at or above runoff in the Sacramento River, resulting in SWP allocations of 40 and 50 percent, respectively. The wet and above-normal period of 2023-2025 enabled Metropolitan to end calendar years 2023, 2024, and 2025, with record-high amounts of dry-year storage of 3.4, 3.8, and 3.8 MAF, respectively.

SWP deliveries could be impacted by future subsidence. For a discussion of subsidence, please see Chapter 3.2.

The Colorado River Basin has also experienced large swings in annual hydrologic conditions. Metropolitan's water supplies from the Colorado River have largely been buffered from these swings by the large volume of storage on the river, especially in Lake Mead and Lake Powell, the two largest reservoirs in the United States. However, current conditions in the Colorado River Basin remain challenging.

In 1999, Lake Mead, the main water supply reservoir for the Lower Colorado River Basin, was full at an elevation of 1,214 feet. However, the 26-year period that followed (2000-2025) was the driest period in the Basin in over 1,200 years, producing the first-ever Lower Basin shortages to Arizona and Nevada in 2022, 2023, 2024, and 2025. As of August 2025, Lake Mead storage has declined to an elevation of 1,054 feet, or 31 percent full. Based on the results of the United States Bureau of Reclamation's (USBR) 2025 August 24-Month Study, the Lower Basin will experience a shortage again in 2026. Conditions have been similarly challenging for Lake Powell. In 1999, the lake was nearly full at an elevation of 3,695 feet. By May 2022, Lake Powell had dropped to 3,523 feet (24 percent full), and USBR projections showed the possibility of the reservoir dropping below its minimum

power pool (3,490 feet) within the following 24 months. In response, USBR and the Lower Basin States (California, Arizona, and Nevada) initiated activities in 2023 to conserve at least 3 MAF by the end of 2026 under a 2024 Record of Decision to supplement the 2007 Interim Guidelines. The Lower Basin states exceeded the target of conserving half of the 3 MAF by the end of 2024, and as of December 2024, they have more than enough conservation activity under contract to meet the 3 MAF target by the end of 2026.

Conservation efforts and wet hydrology in 2023 helped stave off critical elevations in both reservoirs. However, despite near normal snowpack in water year 2024-25, after a hot and dry spring, the forecasted runoff into Lake Powell is forecasted to be just 50 percent of average for the water year. USBR projections suggest that Lake Powell could approach its lowest level ever by the end of 2026, while Lake Mead could reach its lowest level since initial filling in the spring of 2027.

Further, the 2007 Interim Guidelines governing Lower Basin shortages and the operations of Lakes Mead and Powell are set to expire in 2026, and new operating guidelines will need to be developed for 2027 and beyond. At the time of this report, negotiations over the successor post-2026 guidelines are ongoing and have added considerable regulatory uncertainty to the already uncertain hydrologic outlook for the Basin.

Sacramento-San Joaquin River Delta Issues

The Sacramento-San Joaquin River Delta (Bay-Delta) is the hub of California's water supply and is critically important to the entire state. About 30 percent of Southern California's water supply moves across the Bay-Delta. The Bay-Delta's declining ecosystem, caused by a number of factors that include agricultural runoff, predation of native fish species, urban and agricultural discharge, changing ecosystem food supplies, and overall system operation, has led to reduction in water supply deliveries. Regulatory and operational constraints will likely continue until a long-term solution to the problems in the Bay-Delta is identified and implemented.

For additional background on current Sacramento–San Joaquin River Delta conditions affecting the State Water Project, including the proposed Delta Conveyance Project, biological opinions and incidental take permits, and updates to the Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary, see Chapter 3.2.

Water Supply Conditions

The water conditions that the region faced leading up to 2025 were characterized by alternating scarcity and abundance. Conditions leading up to 2025 have ranged from the severe drought period of 2020-2022, which resulted in heavy withdrawals from Metropolitan's dry-year storage reserves, to wet and above-normal years between 2023 and 2025 that allowed Metropolitan to rebuild its storage reserves to record-high levels.

The five-year period began with dry hydrologic conditions in 2020, resulting in a 20 percent SWP allocation. The dry conditions continued into 2021, and worsened in 2022, as reservoirs across the state became depleted, leading to five percent allocations during each year. In 2022, for the first time in history, DWR allocated additional water on a basis other than Table A to meet minimum demands of contractors for human health and safety needs. Meanwhile, the Colorado River Basin experienced three of the lowest consecutive years of inflow on record during 2020-2022. During this time, the combined storage of

Lake Powell and Lake Mead declined from about 50 percent to 25 percent of total live capacity. Metropolitan withdrew roughly 1 MAF from its dry-year storage accounts during 2020-2022 and implemented the Emergency Water Conservation Program from late June 2022 to March 2023 to conserve limited SWP supplies. Wet conditions returned in 2023; with a 100 percent allocation, the highest allocation since 2006. Storage reserves increased by 1.2 MAF, ending the year at the then-record-high amount of dry-year storage of 3.4 MAF. In 2024 and 2025, the SWP watersheds received above-average snowpack, and SWP allocations of 40 and 50 percent, respectively. The continuation of favorable hydrologic conditions allowed Metropolitan to increase its dry-year storage even further to end 2024 and 2025 with 3.8 MAF. Through storage and conservation efforts, as well as developing various drought reliability projects, Metropolitan continues to plan for future dry conditions. In particular, Metropolitan aims to develop resources and projects to withstand similar or worse dry conditions seen in 2020-2022.

Investments in storage and flexible operations have prepared Metropolitan to capitalize on available supplies in wet years and manage through drought years. During the wet year of 2023 and the above-normal year of 2024, Metropolitan achieved the following milestones:

- In 2024, Metropolitan achieved the highest amount of storage accessible by areas reliant on SWP supplies including storage within San Luis Reservoir and SWP banking programs;
- The diversion of Colorado River water into the Metropolitan service area in 2023 and 2024 combined was less than the total diversion of Colorado River water in 2022; and
- In 2023, record creation of Intentionally Created Surplus storage in Lake Mead of 450 TAF.

While recent wet conditions along with flexible adaptive management have brought great successes in building Metropolitan’s storage reserves, water supply challenges remain. These include:

- Analysis of historical records suggest a potential change in the relationship between precipitation and runoff in the Colorado River Basin and has contributed to a drying trend over the last two decades. In 2022, after three years with significantly below average runoff, despite near normal snowpacks, the Colorado River system storage reached its lowest level since the filling of Lake Powell. Despite improved conditions, the Colorado River is still operating under shortage conditions under the 2007 Interim Guidelines.
- Groundwater basins and local reservoirs dropped to very low operating levels due to record-dry hydrology in Southern California in 2022. Due to wetter hydrology in 2023 and 2024, the groundwater basins started to recover. However, despite the wetter hydrology, about 20 percent of groundwater basins remain below established healthy storage levels. The basins were estimated to be about 38 percent full in mid-2025. In addition, groundwater production in the service area has remained at low levels.
- Supply availability in the Los Angeles Aqueduct system continues to be affected by both drought and environmental mitigation efforts related to Owens Lake and the Lower Owens River.

In addition, water quality challenges such as golden mussel and other invasive species infestations, algae toxins, PFAS, and the identification of constituents of emerging concern, have a significant impact on the region's water supply conditions and underscore the importance of flexible and adaptive regional planning strategies.

Current Available Resources

Metropolitan's primary purpose is to provide a supplemental supply of water for domestic and municipal uses at wholesale rates to its member public agencies. Metropolitan's principal sources of water are the SWP and the Colorado River. Metropolitan's robust planning strategy continues to balance available local and imported water resources and member agencies' demands within Metropolitan's service area.

A. Imported Supplies

Metropolitan receives water from the Colorado River through the Colorado River Aqueduct (CRA) and from the SWP through the California Aqueduct. Figure 1-6 shows the historical annual deliveries from the SWP and the Colorado River.

Colorado River

The Colorado River was Metropolitan's original source of water after Metropolitan's establishment in 1928. Metropolitan has a legal entitlement to receive water from the Colorado River under a permanent service contract with the Secretary of the Interior. The CRA, which has a capacity of 1.25 MAF a year, is owned and operated by Metropolitan. It transports water from Lake Havasu, at the border of the state of California with Arizona, approximately 242 miles to its terminus at Lake Mathews in Riverside County.

Over the years, Metropolitan increased reliable supply through the CRA through programs that it helped fund and implement including: farm and irrigation district conservation programs, improved reservoir system operations, land management programs, and water transfers and exchanges through arrangements with agricultural water districts in Southern California, entities in Arizona and Nevada that use Colorado River water, and USBR. A detailed discussion of availability of Colorado River water for delivery to Metropolitan is included in Chapter 3.1. Metropolitan also receives approximately 277,700 AF per year of additional Colorado River supplies pursuant to an exchange agreement with its member agency, San Diego County Water Authority (SDCWA) (the Exchange Agreement). Pursuant to several agreements, SDCWA receives transfers of Colorado River water from Imperial Irrigation District (IID) and water resulting from the Coachella Canal Lining Project and All-American Canal Lining Project. Pursuant to the Exchange Agreement with Metropolitan, SDCWA makes that water available to Metropolitan at Lake Havasu, which Metropolitan then adds to its supplies. In exchange, Metropolitan delivers a like-amount of its own water, from any of its available sources, to SDCWA at the Metropolitan-SDCWA connections.[1]

[1] Prior UWMPs reported these exchanges as SDCWA's local supplies and not as Colorado River water made available to Metropolitan at Lake Havasu with Metropolitan's other Colorado River supplies. This was because Metropolitan reported information in the UWMP as reported by each member agency and SDCWA reported the exchanges as local supplies. Metropolitan has determined that it is most appropriate to report the exchanges here consistently with the transaction, pursuant to Water Code Section 10615. Section 10615 requires that Metropolitan describe and evaluate all sources of supply made available to the district. SDCWA has independently acquired the IID transfer water pursuant to its transfer

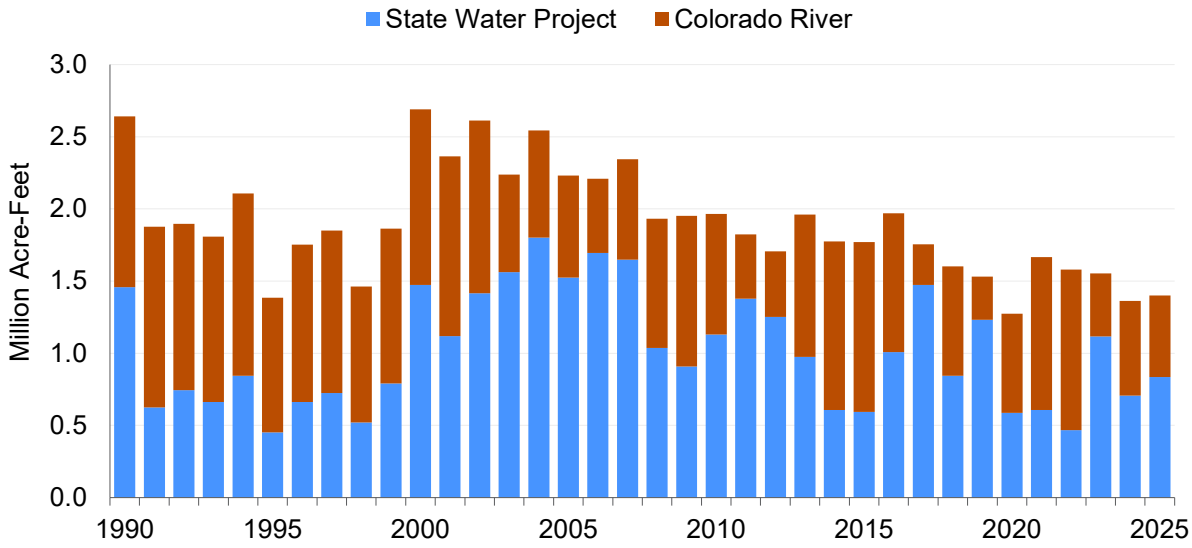
State Water Project

Metropolitan imports water from the SWP in which it has a participation right and is owned by the state of California and operated by DWR. This project transports Feather River water stored in and released from Oroville Dam and conveyed through the Bay-Delta, as well as unregulated flows diverted directly from the Bay-Delta. Metropolitan's SWP supplies are conveyed south of the Bay-Delta via the California Aqueduct to four delivery points— one from the Aqueduct's West Branch at the northwestern portion and three from the East Branch at the northeastern portion of Metropolitan's service area.

In 1960, Metropolitan signed a water supply contract with DWR for participation in the SWP (State Water Contract). Metropolitan is one of 29 agencies that have long-term contracts with DWR (SWP contractors) that are participants in the SWP through State Water Contracts, and is the largest agency in terms of its service area and the number of end users, the share of SWP water that it is allocated pursuant to the State Water Contract (approximately 46 percent), and the percentage of total annual payments made to DWR by agencies with State Water Contracts (approximately 52 percent in 2025, which does not include DCP payments). A more detailed discussion of the SWP supplies is provided in Chapter 3.2.

agreement with IID, and Metropolitan assigned to SDCWA its rights to the canal lining water for 110 years. Under the Colorado River Water Delivery Agreement, the Secretary of the Interior has agreed to deliver this conserved Colorado River water to the Colorado River Aqueduct Intake at Lake Havasu for diversion by Metropolitan. Metropolitan and SDCWA executed the 2003 Exchange Agreement providing for Metropolitan to take possession of the water at Lake Havasu. Metropolitan owns and manages this water at its complete discretion for the benefit of its member agencies. In exchange for the volume made available to Metropolitan at Lake Havasu (at uneven intervals), Metropolitan delivers annually an equal volume to SDCWA from whatever source or sources available to Metropolitan. The parties amended the Exchange Agreement in 2025, but the transactions remain the same for purposes of this analysis. Accordingly, other Metropolitan reports, including the Integrated Water Resources Plan (IRP) and the Annual Report, have accurately not categorized that water as "local supplies." To reflect the transfer of the Colorado River water to Metropolitan at Lake Havasu for its ownership and management, the exchange water is categorized here as water imported from the Colorado River pursuant to the Exchange Agreement and not as a local supply. This is consistent with Section 10615's requirement, and is also consistent with Metropolitan's prior report of the SDCWA exchange water at Section 3.1 of the UWMP and its exclusion from the local supplies at Figure 1-7 of prior UWMP reports.

Figure 1-6
Imported Water Supplies in Metropolitan's Service Area



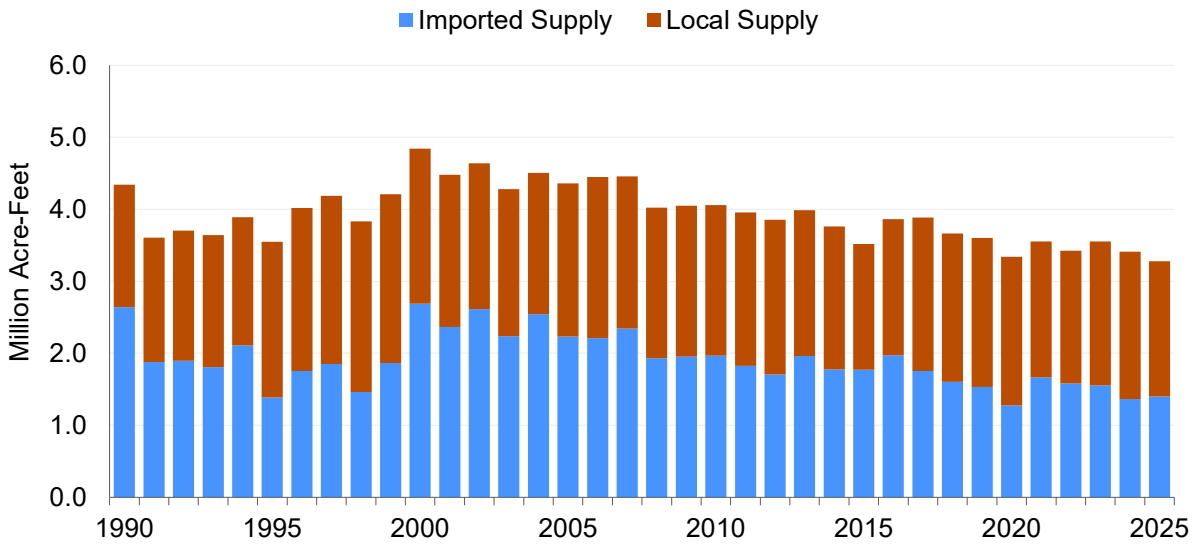
Notes:

1. Calendar year data. All data are subject to revision and reconciliation.
2. SWP Supplies include Table A, Article 21, Article 14(b), Article 12(d), Article 12(e), Article 55, draws from storage & carryover, DWCV & other exchanges, transfers, Drought Water Bank and Dry Year Pool Purchases, Pools A&B, Flood Water, wheeling, Port Hueneme lease, and SBVMWD Purchases.
3. Colorado River supplies are gross Havasu diversions less return flows, deliveries to USBR, Mexico, and storage.

B. Local Supplies

Approximately 55 percent of the region's water demand is met by local water agencies' supplies in the past ten years (2015-2024). Local supplies include water extracted from local groundwater basins, diversions of local surface runoff, treated wastewater for reuse, and the Los Angeles Aqueduct delivery. Figure 1-7 shows the historical annual use of local and imported water supplies within Metropolitan's service area.

Figure 1-7
Imported and Local Water Supplies in Metropolitan's Service Area



Notes:

1. Calendar year data. All data are subject to revision and reconciliation.
2. Local supplies include local groundwater, surface water, recycled water, groundwater recovery, seawater desalination, and the Los Angeles Aqueduct delivery.
3. Imported supplies include Colorado River and SWP.

Groundwater

The groundwater basins that underlie Metropolitan's service area provide an annual average supply of approximately 1.1 MAF (2015-2024 average). Natural recharge of the groundwater basins is supplemented by active recharge of captured stormwater, recycled water, and imported water to support this level of annual production.

Estimates indicate that available storage space in the region's groundwater basins in mid-2025 is approximately 3.0 MAF, which equates to 38 percent full. Successive wet years have resulted in groundwater storage increases across the service area. Many groundwater basin managers and water suppliers have taken steps to store water in advance of dry years to soften the potential impact on groundwater aquifers and to maintain reliable local water supplies during dry years.

However, despite the wetter conditions over the past couple of years, about 20 percent of the groundwater basins continue to have storage levels below their established operating ranges. These basins will need to be replenished with natural recharge during wet years and active spreading of captured stormwater, recycled water, and imported water to increase groundwater basin storage. Without increased storage, these basins may not be able to maintain pumping levels during future drought conditions.

Recycling, Groundwater Recovery, and Seawater Desalination

Recycling and groundwater recovery are local resources that add balance to Southern California's diverse water portfolio. In addition to replenishment of groundwater basins as described above, water recycling provides extensively treated wastewater for applicable

municipal and industrial uses. Common uses of recycled water include landscape irrigation, agricultural irrigation, and commercial and industrial applications. Groundwater recovery employs additional treatment techniques to effectively use degraded groundwater supplies that were previously not considered viable due to high salinity or other contamination.

While water recycling and groundwater recovery projects in the Southern California region are primarily developed by local water agencies, many newer projects have been developed with financial incentives provided through Metropolitan's Local Resources Program (LRP). The LRP is a performance-based program that provides incentives to expand water recycling and support recovery of degraded groundwater, among other types of projects. In fiscal year ending 2025, the regional water production from water recycling and groundwater recovery totaled approximately 584 TAF, of which 93 TAF was developed with Metropolitan funding assistance. A detailed discussion of recycling and groundwater recovery is presented in Chapter 3.5.

Seawater desalination represents a significant opportunity to diversify the region's water resource mix with a new, locally controlled, reliable potable supply. Metropolitan supports seawater desalination to its member agencies by providing technical assistance, regional facilitation of research and information exchanges, and financial incentives through the LRP.

The Claude "Bud" Lewis Carlsbad Seawater Desalination Plant (Carlsbad Plant) is the region's first and only seawater desalination facility in operation and is capable of producing up to 56 TAF per year of potable water. In December 2015, pursuant to its Water Purchase Agreement with the San Diego County Water Authority (SDCWA), Poseidon Resources began operation of the Carlsbad Plant. During calendar years 2016 through 2023, the facility produced an annual average of 45 TAF, meeting nearly 9 percent of SDCWA's service area demands. The Carlsbad Plant does not receive funding through Metropolitan's LRP. Seawater desalination is discussed in more detail in Chapter 3.5.

In April 2024, Metropolitan's Board authorized the first seawater desalination project to receive financial incentives through the LRP. Owned by South Coast Water District (SCWD), the Doheny Ocean Desalination Project will produce up to 5,600 acre-feet per year (AFY) and is expected to become operational in 2030. Currently, Metropolitan, the Municipal Water District of Orange County (MWDOC), and SCWD are in the process of finalizing the LRP agreement.

Surface Water

In addition to the groundwater basins, local agencies maintain surface reservoir capacity to capture local runoff. The average yield captured from local watersheds is estimated at approximately 93 TAF per year (2015-2024 average). The majority of this supply comes from reservoirs within the service area of the SDCWA.

Los Angeles Aqueduct

Although the Los Angeles Aqueduct (LAA) imports water from outside the region, Metropolitan classifies water provided by the LAA as a local resource because it is developed and imported by the Los Angeles Department of Water and Power (LADWP). The LAA has delivered approximately 200 TAF per year on average over the last ten years from 2015 to 2024 and has ranged from a dry year of 33 TAF in 2015 and a wet year of 380 TAF in 2017.

Table 1-5 shows the projected local supplies for a normal water year and under five consecutive years of drought for 2030, 2040, and 2050.

Table 1-5
Local Supplies for Normal and Five-Consecutive Drought Years
(acre-feet)

	2030		2040		2050	
	Normal Year[1]	Dry Year[2]	Normal Year[1]	Dry Year[2]	Normal Year[1]	Dry Year[2]
Local Groundwater						
From Natural Recharge[3]	956,000	974,000	953,000	962,000	950,000	954,000
Replenishment	272,000	248,000	286,000	282,000	288,000	287,000
Local Projects						
Groundwater Recovery	150,000	143,000	157,000	156,000	160,000	160,000
Recycling	564,000	520,000	644,000	641,000	660,000	656,000
Seawater Desalination	56,000	57,000	56,000	62,000	56,000	62,000
Local Runoff Stored	83,000	76,000	70,000	70,000	70,000	72,000
Los Angeles Aqueduct[4]	215,000	97,000	211,000	96,000	208,000	94,000
IID-SDCWA Transfer and Canal Lining[5]	278,000	278,000	278,000	278,000	278,000	278,000
Total	**2,574,000**	**2,394,000**	**2,655,000**	**2,546,000**	**2,669,000**	**2,562,000**

Notes: Total may not sum due to rounding.

1. Normal Year is based on 1922-2021 hydrologic conditions.
2. Dry Year is based on five consecutive years of drought (1988-1992).
3. Natural recharge is based on basin balance including projected local groundwater production and replenishment deliveries to the groundwater basins.
4. The LADWP's Los Angeles Aqueduct supply is considered by Metropolitan as local supply.
5. The SDCWA's Conserved Water and Canal Lining Water per SDCWA-IID Transfer Agreement supply is considered by Metropolitan as local supply.

Metropolitan's Actions to Address Supply Challenges

Metropolitan progressively addressed the challenges of water shortages caused by the dramatic swings in annual hydrologic conditions that have characterized the past decade on the SWP. Metropolitan took actions that include: (1) Increasing water conservation by expanding outreach, adding devices, and increasing incentives to residents, (2) Increasing local resources by providing incentives for on-site recycled water hook-up and increasing incentives for the LRP, (3) Augmenting water supplies through water transfers and

exchanges, (4) Improving return capability of storage programs, (5) Modifying Metropolitan's distribution system to enhance the use of Colorado River water, and (6) Implementing shortage allocations to distribute the limited imported supplies and preserve storage reserves.

Increasing Water Conservation

Metropolitan supports financial incentives, education, outreach programs, and appliance/plumbing standards at both the regional and local levels to ensure water conservation meets this goal.

On January 1, 2025, the Making Conservation a California Way of Life regulation went into effect following the passing of Assembly Bill (AB) 1668 and Senate Bill (SB) 606 in 2018, superseding state legislation that had previously identified percentage-based water efficiency targets. This regulation sets forth a framework (Framework) for retail water providers to more accurately gauge water use in their service area, submit annual water use reports to the SWRCB, and implement performance measures to reach urban water use objectives. While Metropolitan as a water wholesale agency is not subject to compliance with this new legislation, its conservation efforts are designed to help its member agencies and their retailers meet their water use efficiency and reporting requirements.

In response to historically dry conditions, Metropolitan's Board has authorized as much as $450 million in annual funding for its Conservation Credits Program (CCP), which encompasses the suite of Metropolitan's conservation incentive programs. More recently, annual funding for conservation incentives has fluctuated around $50 million per year, and the programs continue to garner strong participation. In order to assist retail agencies in the service area, Metropolitan has continued to subsidize member agency local projects under the CCP to help agencies meet local goals or mandatory state water reduction targets. Frequent swings between drought and wet conditions have established the importance of continuing to encourage water efficiency and conservation efforts, and Metropolitan continues to maintain programs to ensure that water supplies in its service area remain reliable. Potable gallons per capita per day (GPCD), a common indicator of residential water demand, has been falling over the last few decades, and Metropolitan's six-county region achieved a record low 114 GPCD in 2023.

Metropolitan's conservation program has seen numerous changes driven by cycles of higher and lower participation during drought and non-drought periods. Changes to the conservation incentive programs and water conservation activities reflect Metropolitan's efforts to continuously refine and implement programs to meet existing and anticipated needs. Focus has shifted from relying heavily on providing incentives to developing additional training and research programs to supplement conservation activity. This focus was designed to reach a broader audience in order to maintain water demand levels achieved during periods of recent drought. The educational courses teach attendees the numerous benefits of water-efficient landscaping and how to convert their traditional landscaped yards to something more appealing and sustainable, while greatly reducing their outdoor water usage. Ongoing educational efforts include turf replacement, California Friendly native plants, and landscaper training classes.

Recent conservation highlights include the launching of a tree rebate as part of the turf replacement program, expanding water efficiency incentives with energy utilities, enhancing flexibility within member agency project funding, and introducing new eligible devices for the commercial rebate program. Many recent changes Metropolitan has implemented in its water use efficiency programs and incentives help the member and retail agencies to quantify water saving efforts in their service areas to meet the State's urban water use objectives. Other resources include identifying additional funding opportunities, grant funding for local programs, and advocacy for meaningful policies to assist with Framework compliance.

Increasing Local Resources

Since 1982, Metropolitan has assisted local agencies in the development of water recycling and groundwater recovery under the Local Resources Program (LRP). The LRP has evolved over time in an effort to help support the development of local supply projects including the methodology for providing the incentives to member agencies. In October 2014, Metropolitan's Board approved additional LRP refinements to support further development of local resources, which included increasing the maximum incentive amount, offering three incentive payment structures, including on-site recycled water retrofit costs, including other water resources (such as seawater desalination and stormwater), and providing reimbursable services for Metropolitan's technical assistance.

On-site Retrofit Program

In February 2014, Metropolitan's Board approved the On-site Retrofit Pilot Program to offer incentives to convert potable water irrigation or industrial water systems to recycled water use. In April 2016, Metropolitan's Board approved extending the On-site Recycled Water Retrofit Program and authorized additional funding for the program.

Stormwater Pilot Programs

In September 2019, Metropolitan's Board approved the Stormwater for Direct-use Pilot Program to offer incentives for development and monitoring of new and existing direct-use stormwater projects. The purpose of the pilot program was to collect data from several region-wide stormwater projects in order to help evaluate the potential water supply benefits delivered by stormwater capture projects and provide a basis for potential future funding approaches. The pilot program stopped accepting applications on December 31, 2021. In total, three agreements were authorized by Metropolitan's Board. Two projects have completed construction and are currently in the monitoring phase, and one project is currently in the process of being terminated by the agency.

In November 2019, Metropolitan's Board approved the Stormwater for Recharge Pilot Study. The purpose of this study is to evaluate the relationship between stormwater capture and yield to define the water supply benefits of stormwater. Yield for purposes of this study is defined as either increased groundwater production or decrease in imported water needs relative to baseline. The study also requires a minimum of three years of monitoring, both of the amount of stormwater captured and the impact to the groundwater basins via groundwater modeling and monitoring wells or sensors. Agreements were entered into in 2021 for two monitoring projects and in 2022 for one construction project. All data collection for each pilot is still ongoing. The studies will help evaluate the potential water supply

benefits delivered by stormwater capture projects and provide a basis for potential future funding approaches.

Augmenting Water Supplies

Augmenting water supplies through water transfers and exchanges is an element of Metropolitan's IRP to mitigate water shortages during dry periods.

The Colorado River system has experienced a drying trend since 2000, leading to substantially decreased water levels in both Lakes Mead and Powell.

In 2021, in response to two years of runoff conditions that were significantly below normal, USBR, Arizona Department of Water Resources (ADWR), CAWCD, SNWA, and Metropolitan signed a Memorandum of Understanding to facilitate additional conservation in the amount of 1 MAF over a two-year period. This ended up being referred to as the "500+" plan and included joint funding of projects. The water savings from this program became system water and supported lake elevations. Despite being on track to conserve 1 MAF, continued extremely dry conditions led to the development of a new program that started in 2023.

In 2023, Metropolitan began participation in additional activities with other Lower Basin partners to conserve 3 MAF as part of USBR's Lower Colorado River Basin System Conservation and Efficiency Program (LC Conservation Program), a goal which was later documented in a 2024 Record of Decision to supplement the 2007 Interim Guidelines. These activities include measures implemented during the period 2023 through 2026. Metropolitan is participating in the LC Conservation Program by yielding several of Metropolitan's conservation programs with California agricultural partners to USBR for production of system conservation. These programs include the Palo Verde Irrigation District Land Management, Crop Rotation, and Water Supply Program, the Bard Water District Seasonal Fallowing Program, and the Quechan Diversion Forbearance Program. Metropolitan is also participating in USBR-funded conservation activities to be implemented over a longer timeframe (30 years), including an expansion of Metropolitan's urban turf removal program, a new leak detection and repair program, and funding a part of Metropolitan's groundwater storage program with Antelope Valley-East Kern Water Agency which is further described below, and leaving conserved water in Lake Mead. All of these activities are aimed at boosting the levels of Colorado River reservoirs.

Metropolitan also entered into several agreements to improve Metropolitan's operational flexibility on both a short-term and mid-term basis:

- In November 2015, Metropolitan's Board authorized entering into agreements with Antelope Valley-East Kern Water Agency (AVEK) to develop exchange and storage programs for SWP supplies. This would be an uneven exchange: for every two acre-feet provided to Metropolitan, AVEK would receive back one acre-foot in the future. Metropolitan may also store at least 30 TAF of its SWP supplies in wet years in the Antelope Valley groundwater basin.
- In September 2020, Metropolitan's Board authorized five-year price terms for the purchase of transfer supplies under the Yuba Accord. Metropolitan has received around 250 TAF of new supplies before losses under the program. Metropolitan staff engaged in negotiations with DWR, Yuba County Water Agency, and other

participating contractors to extend the Yuba Accord long-term transfer program beyond December 31, 2025. Metropolitan's board authorized an amendment to the agreement in December 2025.

- In March 2021, Metropolitan's Board authorized entering into an agreement with the San Bernardino Valley Municipal Water District to obtain surplus SWP supplies. The program provides improved water supply reliability to Metropolitan and Metropolitan's member agencies within the Santa Ana River Watershed. The program is estimated to provide a long-term average of around 13 TAF per year to the region.
- In December 2021, Metropolitan's Board authorized a two-year pilot seasonal fallowing program with the Quechan Tribe of the Fort Yuma Indian Reservation. In November 2023, Metropolitan's Board authorized extending the program to the end of 2026. Under the program, participating farmers on land they lease from the Quechan Tribe are paid to reduce their water use by not irrigating a portion of this land. A maximum of 1,600 acres can be fallowed in any given year.
- In November 2024, Metropolitan's Board authorized entering into option agreements with Richvale Irrigation District and Western Canal Water District for the first right to purchase up to 54 TAF of their available transfer supplies during 2025 through 2027. Pursuant to the agreements executed in January 2025, Metropolitan paid each agency $250,000 for the first right to purchase the transfer supply at prices of $600 to $965 per AF. The transfer supply would be generated by the fallowing of rice crops in their districts located in the Feather River service area.

Improving Return Capabilities of Storage Programs

Metropolitan has storage programs with water agencies along the California Aqueduct that allow it to store SWP supplies during surplus conditions and to have stored water returned when needed. Metropolitan provided up-front capital costs to its water management program partners to build infrastructure to improve the return capabilities of several storage programs.

- In March 2015, Metropolitan's Board authorized entering into agreement with Kern-Delta Water District to improve the return reliability of the Kern-Delta Water District Water Management Program. The improvement includes a pipeline that would reduce losses when Kern River supplies are delivered for exchange. Metropolitan's up-front costs will be more than offset through an elimination of put regulation fees on the next 20,000 AF delivered into the program. Metropolitan has not incurred any cost to date, as the pipeline has not been constructed. Environmental and regulatory issues have delayed implementation of the pipeline.
- In April 2019, Metropolitan's Board authorized entering into an agreement with AVEK for the High Desert Water Bank. Under the High Desert Water Bank, Metropolitan could store up to 280,000 AF of its SWP Table A or other supplies in the Antelope Valley groundwater basin. Metropolitan will have first priority to 70,000 AF per year of both put and take capacity. Metropolitan will pay AVEK for the capital costs for construction of monitoring and production wells, turnout from the California Aqueduct, underground pipelines, recharge basins, water storage, and

booster pump facilities. In addition, Metropolitan would subsequently pay actual operation and maintenance, energy, and recovery usage fees to recover the water in storage. Phase 1 of High Desert Water Bank was completed in 2023, and deliveries into this storage program began in September of that year.

Modifying Metropolitan's Distribution System

In the severe drought of 2013 and 2014, the SWP allocation for calendar year 2014 was five percent of Table A, which represents about 96,000 acre-feet of water for Metropolitan. During the drought, Metropolitan modified its normal operations in several areas of the system to use Colorado River water to provide service to areas as far west as the cities of Thousand Oaks and Calabasas, as well as other locations within Metropolitan's system, some of which had not received Metropolitan water from the Colorado River for extended periods since the completion of the SWP in the early 1970s.

Following the drought, Metropolitan's Board approved two projects to increase system flexibility to deliver Colorado River water and Diamond Valley Lake (DVL) water to new areas of the system.

- In April 2014, Metropolitan's Board authorized a project that would allow Metropolitan to serve water from multiple sources, such as DVL, to the Mills Treatment Plant in Riverside. The initial phase, construction of an interconnect between the Inland Feeder and the Lakeview Pipeline, near San Jacinto, California, was completed in October 2014, which allowed for an initial flow of water. The second phase of the project, lining of the Bernasconi Tunnel No. 2 was completed in March of 2015 and allowed for increased flows from DVL. The final phase of the project, installation of three large valves to improve flow control was completed in 2018.
- In May 2014, Metropolitan's Board authorized the design of improvements to the Greg Avenue Pump Station to enhance water supply reliability in the West Valley area and construct flow control modifications to the outlet of the Jensen Water Treatment Plant. These projects currently allow the West Valley area and Ventura County, which is served normally with SWP water only, to receive blended supplies from the SWP and the Colorado River. Construction of the Greg Avenue Pump Station improvements to enhance the long-term reliability of the pumps was authorized in February 2019 and was completed in May 2021.

More recently, extraordinary dry conditions throughout the state of California in calendar years 2021 and 2022 resulted in consecutive five percent allocations from the SWP. Although Metropolitan had been utilizing storage reserves to help bridge the gap between the low SWP supplies and its demand for SWP water, multiple operations and drought actions were implemented in late spring of 2021, and continued through the end of 2022, to help preserve the limited SWP supply. In 2021 and 2022, Metropolitan also utilized the Greg Avenue Pump Station and the Inland Feeder-Lakeview Pipeline Interconnection to deliver available Colorado River water and DVL storage supplies to the West Valley area and the Mills Water Treatment Plant service area, respectively. Despite the system modifications and changes to operation, Metropolitan's Board approved supply allocations under a new Emergency Water Conservation Program for member agencies highly dependent on SWP supplies.

As a result of the last drought, additional system modifications have been identified to improve delivery flexibility and enable Metropolitan to utilize Colorado River water and stored DVL supplies over a wider part of its service area. The following projects were presented to the Board in February 2024 as part of a proposed Drought Mitigation Action Portfolio.

- The Diamond Valley Lake to Rialto Pipeline Project was approved by the Board for inclusion in Metropolitan's Capital Investment Plan (CIP) in December 2021. This project involves four individual improvements to accomplish this operation, which include the Wadsworth Pumping Plant bypass, the Badlands Tunnel Surge Protection Facility, the Foothill Pump Station Intertie, and the Inland Feeder Rialto Pipeline Intertie. Construction is currently underway and is anticipated to be completed in 2028.
- The Sepulveda Feeder Pump Stations Project was approved by the Board for inclusion in the CIP in February 2022. Stage 1 of the project would add two new pump stations at the Venice and Sepulveda Canyon Pressure Control Structures on the Sepulveda Feeder to enable pumping of up to 30 cfs of treated Colorado River water or stored DVL water to the West Valley area. The Sepulveda Feeder Pumping Operation (Stage 1) is currently in design and is anticipated to be completed in 2027.

The Drought Mitigation Action Portfolio included additional potential system modifications including flexibility projects and new storage projects. These projects continue to be developed and will be evaluated for their effectiveness within Metropolitan's CIP evaluation and Climate Adaptation Master Plan for Water (CAMP4W) evaluation processes.

In the face of another five percent SWP Table A allocation in upcoming years, Metropolitan is applying the lessons learned from the last drought and will benefit from the distribution system modifications that help minimize the use of limited SWP supplies. Additionally, several Metropolitan member agencies made modifications within their own local systems to maximize the use of more readily available Colorado River water and DVL supplies and to further reduce the use of scarce SWP supplies.

Implementing the Shortage Response Actions, When Needed

Section 10632 of the California Water Code (CWC) requires every urban water supplier prepare and adopt a Water Shortage Contingency Plan (WSCP). The WSCP is a guide for a supplier's intended actions during water shortage conditions. It is meant to improve preparedness for droughts and other impacts on water supplies by describing the process used to address varying degrees of water shortages. While intended to be a stand-alone plan that may be revised outside of the UWMP process, the CWC required suppliers to initially include the WSCP as part of their 2020 UWMP. Metropolitan's Board adopted its WSCP in May 2021. An updated WSCP was adopted in 2026 and is in Appendix 4.

Metropolitan developed its WSCP to be consistent with its existing Water Surplus and Drought Management (WSDM) Plan and Water Supply Allocation Plan (WSAP). Metropolitan's WSDM Plan, approved in 1999, provides policy guidance for managing regional water supplies during surplus and shortage conditions. It provides an overall vision for operational supply management and characterizes a flexible sequence of actions to minimize the probability of severe shortages and reduce the likelihood of extreme shortages. Thus, the WSDM Plan principles guide the specific actions to be taken under WSCP shortage stages. Metropolitan's WSAP, developed in 2008, is integral to the WSCP's shortage response strategy. In the event that Metropolitan determines that shortage response actions through supply augmentation and demand reduction measures are insufficient to meet a projected shortage, the WSAP may be implemented to fairly distribute a limited amount of water supply using a detailed methodology that reflects the range of local conditions and needs of the region's retail water consumers.

Metropolitan's Board authorized the implementation of the WSAP for the period of July 2009 through April 2011 in response to the drought and low storage reserves. During the dry period of 2012 through 2016, Metropolitan managed its operations through significant use of regional storage reserves. It was anticipated that at end of year 2014, total dry year storage reserves would approach levels similar to those when the WSAP was first implemented in 2009. On December 9, 2014, Metropolitan's Board approved adjustments to the formula for calculating member agency supply allocations for future implementation of the WSAP. On April 14, 2015, Metropolitan's Board approved implementation of the WSAP at a Level 3 Regional Shortage Level, effective July 1, 2015, through June 30, 2016. The WSAP allows member agencies the flexibility to choose among various local supply and conservation strategies to help ensure that demands on Metropolitan stay in balance with limited supplies.

In April 2022, Metropolitan's Board declared a Water Shortage Emergency Condition in a portion of Metropolitan's service area that was dependent on SWP supplies because of severe drought conditions and infrastructure constraints that severely limited the delivery of SWP supplies in 2020-2022. During 2022, six of Metropolitan's member agencies were reliant upon water sourced from the SWP. Associated with the Water Shortage Emergency Condition, the Board also approved an Emergency Water Conservation Program (EWCP) that imposed stringent outdoor watering restrictions or volumetric limits on SWP water supply deliveries to the impacted six member agencies in order to reduce non-essential uses of water. The EWCP began implementation on June 1, 2022, and was authorized through June 30, 2023. However, following the improved hydrologic conditions in the

beginning of 2023, Metropolitan's Board removed the Water Shortage Emergency Condition and terminated the EWCP in March 2023.

Improved supply conditions in 2023, 2024, and 2025 allowed Metropolitan to rebuild its storage reserves. Metropolitan's regional dry-year storage was 3.8 MAF at the end of 2025. In addition, Metropolitan also has 750 TAF of stored supplies reserved to meet service area demands during emergency conditions. Metropolitan's comprehensive shortage response planning, combined with improved storage reserves, puts the region in a better position to withstand future dry conditions. Metropolitan's WSCP, WSDM Plan, and WSAP are described in detail in Chapter 2 and Appendix 4.

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Planning for the Future

2

The purpose of this section is to show the approach and extent to which Metropolitan plans to meet Southern California's water supply needs in the future. In its role as supplemental supplier to its 26 member agencies in Southern California, Metropolitan faces ongoing challenges in meeting its member agencies' needs for water supply reliability and quality in the region. Increased environmental regulations and competition for water from outside the region have resulted in changes in delivery patterns and timing of imported water supply availability. At the same time, the Colorado River has experienced a drying trend since 2000, resulting in reservoir levels that are reduced from historical levels.

As described in the previous chapter, the water used in Southern California comes from a number of sources. Metropolitan provides, on average, about half of the water needs in its service area from the Colorado River via the Colorado River Aqueduct (CRA), and from the Sacramento-San Joaquin Delta via the State Water Project (SWP). As Metropolitan continues to face various water supply challenges, the development of adaptable resource management strategies must meet a range of possible future conditions.

Metropolitan's continued progress in developing a diverse resource mix enables the region to meet its water supply needs. The investments that Metropolitan has made and its ongoing efforts in many different areas coalesce toward its goal of long-term regional water supply reliability. Metropolitan's actions have been focused on the following:

- Continuing water conservation
- Developing water supply management programs outside of the region
- Developing storage programs related to the SWP and the Colorado River
- Developing storage and groundwater management programs throughout California
- Increasing water recycling, groundwater recovery, stormwater, and seawater desalination
- Pursuing long-term solutions for the ecosystem and regulatory and water supply issues in the Sacramento-San Joaquin Delta and Colorado River

Metropolitan has undertaken a number of planning initiatives over the years. This chapter summarizes past and current efforts, which include the 1996 Integrated Water Resources Plan (IRP) and its three updates in 2004, 2010, and 2015; the 2020 IRP Regional Needs Assessment; the Water Shortage Contingency Plan; the Water Surplus and Drought Management Plan; the Water Supply Allocation Plan; Metropolitan's Emergency Storage Objective; Seismic Risk Assessment and Mitigation Plan; and most recently the Climate Adaptation Master Plan for Water (CAMP4W). Collectively, they provide a policy framework, operating guidelines, and resource targets for Metropolitan to ensure regional

water supply reliability. While Metropolitan coordinates regional supply planning through its inclusive IRP process, Metropolitan's member agencies also conduct their own planning analyses—including their own urban water management plans—and may develop projects independently of Metropolitan.

Appendix 5 shows a list of existing and potential local projects provided to Metropolitan by its member agencies.

2.1 Integrated Water Resource Planning

In 1993, Metropolitan commenced an Integrated Water Resources Planning process as the beginning of a new era of regional reliability planning for its Southern California service area. As this planning process began, Metropolitan held a series of three regional assemblies from 1993 through 1995 addressing strategic planning issues. Attendance at these regional assemblies included Metropolitan's Board, Metropolitan's senior management, member agency managers, local retail water providers, groundwater basin managers, and invited public representatives. The purpose of these regional assemblies was to gain consensus on resource policy issues, provide direction for future work, and to endorse regional objectives, principles, and strategies.

A key outcome of the regional assemblies was the establishment and adoption of water supply principles, which provided critical policy guidance for the development and adoption of future Metropolitan IRPs. In summary, these principles state:

- No water supplier in Southern California is an isolated, independent entity unto itself, and all, to varying degrees, are dependent upon a regional system of water importation, storage, and distribution.
- Metropolitan plays a leading role in Southern California's regional water management, having the responsibility for importing water from outside the region and convening dialogues on regional water issues, encouraging local water development and conservation, advocating the region's interests to the state and federal governments, and leading the region's water community.
- Water suppliers at all levels have a responsibility to promote a strong water ethic both within the water community and among the public, developing plans through open processes, committing to achieving adopted regional goals and strategies, and committing to a policy of equity and fairness in development and implementation of water management programs.

These regional assemblies laid the foundation for Metropolitan's integrated regional planning path from 1996 to the present. This path has guided Metropolitan's water resources strategy from the initial adoption of the Metropolitan's IRP in 1996 to successive IRP updates in 2004, 2010, and 2015, and the 2020 IRP Regional Needs Assessment.

The 1996 IRP

Metropolitan's inaugural IRP established a long-term, comprehensive water resources strategy to provide the region with a reliable and affordable water supply. One of the fundamental outcomes of the 1996 IRP was the identification and subsequent implementation of a diverse portfolio of resource investments in both imported and in-region supplies, and in water conservation measures. The 1996 IRP further emphasized

the construction and creation of a network of water storage facilities, both below and above ground. It also set a regional water supply reliability goal of providing full capability to meet all retail-level water demands under all foreseeable hydrologic events.

The 1996 IRP process identified cost-effective solutions that offered long-term reliability to the region. Having identified the need for a portfolio of diversified supplies to meet its demands, the 1996 IRP analyzed numerous resource portfolios seeking to find a preferred resource mix that would provide the region with reliable and affordable water supplies through 2020. The analysis determined the preferred mix of resources based on cost-effectiveness, diversification, and reliability. Establishing the preferred resource mix was an integral part of the 1996 IRP, and subsequent updates have continued to focus on how best to diversify Metropolitan's water portfolio and establish the broad resource targets for the region that helped to meet IRP objectives.

The 2004 IRP Update

The 2004 IRP Update was the first major review and update in the IRP process. The 2004 IRP Update reviewed the goals and achievements of the 1996 IRP, identified the changed conditions for water resource development, and updated resource development targets through 2025. These targets included increased conservation savings and planned increases in local supplies. The 2004 IRP Update also explicitly recognized the need to handle uncertainties inherent in any planning process. Some of these uncertainties include:

- Fluctuations in population and economic growth
- Changes in water quality regulations
- Discovery of new chemical contaminants
- Regulation of endangered species affecting sources of supplies
- Changes in climate and hydrology

To address these uncertainties, a key component of the 2004 IRP Update was the addition of a ten percent planning buffer. The planning buffer identified additional supplies, both imported and locally developed, that could be implemented to address uncertainty in future supplies and demands.

The 2010 IRP Update

In keeping with the reliability goal established under the original 1996 IRP of meeting full-service demands at the retail level under all foreseeable hydrologic conditions, the 2010 IRP Update sought to stabilize Metropolitan's traditional imported water supplies and establish additional water resources to withstand California's inevitable dry cycles and growth in water demand. The 2010 IRP Update marked the first time that Metropolitan and its member agencies explicitly acknowledged the increasing impact that emerging challenges and uncertainties such as environmental regulations, threats to water quality, climate change, and economic unknowns would have on planning for a reliable, high-quality, and affordable water supply. By 2010, the Colorado River had experienced below-average precipitation conditions for most of the previous decade, and the SWP was facing historic regulatory cutbacks that significantly reduced its supplies that pass through the Sacramento-San Joaquin Delta in Northern California. Recognizing that the conditions for

developing and maintaining water supply reliability had changed, Metropolitan set out not only to update the IRP, but also to examine how best to adapt to the new water supply paradigm.

Adaptive Management Strategy

The 2010 IRP Update specifically planned for uncertainty with a range of adaptive management strategies that both meets demands under observed hydrologic conditions and responds to future uncertainty. The plan provided solutions by developing diverse and flexible resources that perform adequately under a wide range of future conditions. Specifically, the adaptive management strategy was a three-component plan that included the following:

Core Resources Strategy – Designed to maintain reliable water supplies under known conditions. The Core Resources Strategy represented baseline efforts to manage water supply and demand conditions. This strategy was based on "what we know today," including detailed planning assumptions about future demographic scenarios, water supply yields, and a range of observed historical weather patterns. Under this strategy, Metropolitan and its member agencies would advance water use efficiency through conservation and recycled water, along with further local supply development such as groundwater recovery and seawater desalination. Metropolitan would also stabilize traditional imported supplies from the Colorado River and Northern California.

Uncertainty Buffer – A suite of actions which help to mitigate short-term changes. The 2010 IRP Update set goals for a range of potential buffer supplies to protect the region from possible shortages in a cost-effective manner, starting with a further expansion of water use efficiency on a region-wide basis. The buffer would enable the region to adapt to future circumstances and foreseeable challenges that were not assumed under the Core Resources Strategy, such as short-term loss of local supplies or regulatory restrictions.

Foundational Actions – Strategies for additional water resources to augment the core or buffer supplies. Foundational Actions were designed to prepare the region by determining viable alternative supply options for long-range planning. These preparatory actions, including feasibility studies, technological research and regulatory review, were designed to lay the foundation for potential alternative resource development.

The 2015 IRP Update

Following the 2010 IRP, drought in California and across the southwestern United States had put the IRP adaptive management strategy to the ultimate stress test. Dry conditions in California persisted into 2015, resulting in a fourth consecutive year of drought. The year 2015 began with the driest January on record, resulting in the earliest and lowest snowpack peak in recorded history at only 17 percent of the traditional snowpack peak on April 1st. In the ten years since 2006, there were only two wet years, with the other eight years having been below normal, dry, or critically dry. Within Southern California, continuing dry conditions impacted the region's local supplies, including its groundwater basins.

Throughout 2015, Metropolitan engaged in a comprehensive process with its Board of Directors and member agencies to review how conditions had changed since the 2010 IRP Update and to establish targets for achieving regional reliability, taking into account known opportunities and risks. Areas reviewed in the 2015 IRP Update include demographics,

hydrologic scenarios, water supplies from existing and new projects, water supply reliability analyses, and potential resource and conservation targets. Metropolitan's Board of Directors adopted the 2015 IRP Update on January 12, 2016.

The 2015 IRP Update reaffirmed Metropolitan's adaptive approach, revised resource targets, identified transfers and exchanges to address short-term risk, and reaffirmed the importance of taking action to accelerate the development of new water supplies through future supply actions. Additionally, the 2015 IRP Update developed approaches for how Metropolitan could advance conservation and local resources development and maximize its storage reserves in a future at risk for more severe and frequent droughts. The 2015 IRP Update also included Future Supply Actions (renaming the Foundational Actions component of the 2010 IRP Update to better reflect the attention on developing future supplies) that would advance a new generation of local supplies through public outreach, development of legislation and regulation, technical studies and support, and land and resource acquisitions.

The 2020 IRP Regional Needs Assessment

After the 2015 IRP Update, the region received a brief respite from drought. From 2016 to 2020, Metropolitan leveraged its prior investments in conservation, local projects, regional storage, distribution, and treatment infrastructure to improve its water supply position. Despite record amounts of storage at the end of 2020, consecutive low SWP allocations in 2020 and 2021 highlighted vulnerability within Metropolitan's system and water supply reliability. The extreme changes in hydrologic conditions since the 2015 IRP Update underscored the need to examine a wider range of outcomes.

The 2020 IRP Regional Needs Assessment provides a broader look and concept than the previous IRP updates. The 2020 IRP strengthens the adaptive management approaches employed in prior updates through the incorporation of an explicit scenario planning step. Coming on the completion of a full "planning cycle" with reaching the end of the planning horizon of the 1996 IRP, the 2020 IRP benefited from a fuller understanding of the lessons learned from the previous 25 years. The key lesson is that the future is not predictable and is a function of many diverse drivers that are out of the control of the water community. The purpose of scenario planning is to broaden the understanding of plausible, but uncertain, future conditions affecting both supplies and demands. On the demand side, uncertainties surrounding future economic conditions, the extent to which local supplies are developed, and water use behavior will guide member agency dependence on Metropolitan in meeting their retail demands. On the supply side, factors like climate change impacts and regulatory uncertainty are expected to affect future supply availability in unpredictable ways.

With these uncertainties in mind, scenario planning helps to improve the understanding of a broader range of potential outcomes. In turn, those outcomes allow a greater understanding of potential challenges to water supply reliability and the impacts of possible policy direction, helping to inform actions.

While prior IRP updates have addressed uncertainty, adaptation, and preparedness, the addition of a scenario planning element to the process further explores the plausible futures that Metropolitan may confront. Since retaining the ability to adapt through investments in preparedness can be expensive, the scenario planning element should support informed

decisions regarding affordable levels of preparedness, as well as identify unacceptable consequences of inaction.

The process of developing scenarios was built on a comprehensive identification of those drivers of change that affect supply stability and demands on Metropolitan. Building on input received from the Board, member agencies, and the public, four scenarios were developed within a framework that examined the drivers of change over a range of future demands on Metropolitan and imported supply stability. This exercise provided four sets of logical, quantified assumptions resulting in unique supply demands gaps against which various investment options can be tested.

The 2020 IRP Regional Needs Assessment outcomes can be summarized through a set of findings grounded in the scenario reliability analysis. Grouped by topic, the findings of the 2020 IRP were as follows:

SWP Dependent Areas

- Vulnerabilities in Metropolitan's SWP Dependent Areas are more severe given reduced reliability of SWP supplies and Metropolitan distribution system constraints under certain conditions. Actions identified in the implementation phase must prioritize addressing the SWP Dependent Area's reliability challenge.
- New core supplies must be accessible to Metropolitan for delivery to the SWP Dependent Areas. Greater access to existing core supplies can also increase SWP Dependent Area reliability.
- Enhanced accessibility to core supplies and storage, both existing and new, will improve Metropolitan's service to the SWP Dependent Area and overall reliability. This includes improvements to Metropolitan's distribution system and capacity to deliver non-SWP supply and storage.
- Storage capacity, put/take capabilities, and accessibility are critical considerations for Metropolitan's system in the SWP Dependent Area. New storage capacity and put/take capabilities should be consistent with the portfolio analysis. New storage must be accessible for delivery to the SWP Dependent Areas.

Storage

- Storage capacity, put/take capabilities, and accessibility are critical considerations in maintaining reliability under the region's current and future conditions, especially for delivery to the SWP Dependent Areas.
- Maintaining Metropolitan's existing storage portfolio is critical, including the consideration of re-negotiating contracts when they expire.
- Expanding existing or developing new storage programs and investments in Metropolitan's distribution system can reduce the need for new core supply development to meet potential future shortages and adapt to climate change.
- When evaluating storage options, put/take capabilities are essential; even storage programs with modest put/take capabilities help reduce the need for flexible supply.

Retail Demand/Demand Management

- Metropolitan's future supply reliability may fluctuate based on demand increases and decreases.
- Variability in retail demand largely comes from changes in outdoor water use. Outdoor water use behavior is complex, influenced by weather and climate and by awareness of water scarcity and other conservation measures.
- It is important to pay attention to demand rebound, demand growth, and demand reductions, and take appropriate regional measures as necessary.
- Managing long-term demands through the efficient use of water reduces dependency on supplies, helps preserve storage, and helps reduce the need for extraordinary conservation measures.

Metropolitan Imported Supplies

- Existing imported supplies are at risk from various drivers of uncertainty.
- Maintaining existing imported supply reliability reduces the need for new core supply development and leverages years of investments.
- SWP supplies are highly susceptible to varying hydrologic conditions, climate change, and regulatory restrictions.
- Variability and capacity in SWP supplies provide opportunities to store water during wet periods for use in dry years, including Colorado River storage. Metropolitan's ability to distribute or store SWP supplies when they materialize will enhance the region's reliability, particularly in its SWP Dependent Areas. The Colorado River system and Colorado River Aqueduct capacity do not offer the same opportunities concerning SWP storage.
- Shortages on the Colorado River will limit the reliability of Colorado River Aqueduct deliveries as a core supply in the future.

Local Supply

- Maintaining existing and developing new local supplies is critical in helping manage demands on Metropolitan.
- Impacts to reliability occur if local supply assumptions are not achieved; therefore, it is important to track the progress of local supply development.
- Additional actions may be needed should existing and future local supply levels deviate from IRP assumptions.

As a decision support method, scenario planning provides Metropolitan a means to consider and adapt to uncertain futures with choices that increase preparedness, improve resiliency, and manage vulnerabilities across a broad range of plausible outcomes.

Climate Adaptation Master Plan for Water (CAMP4W)

In February 2023, Metropolitan's Board directed staff to integrate water resources, climate considerations, and financial planning into a comprehensive Climate Adaptation Master

Plan for Water (CAMP4W), for the second phase of Metropolitan's long-term IRP planning process. CAMP4W incorporates the results and findings of the 2020 IRP Regional Needs Assessment into a collaborative process to identify and evaluate integrated regional solutions. The intent of CAMP4W is to translate the high-level portfolio analysis from the Regional Needs Assessment into guidance for specific policies, programs, and projects to address the findings, and mitigate the potential shortages.

CAMP4W comprises multiple components which together form an ongoing master planning program. Foundational inputs to the planning process and implementation decisions include the 2020 IRP Regional Needs Assessment, climate risk and vulnerability assessments, ongoing infrastructure studies and assessments, and regular public and partner engagement.

In April 2025, Metropolitan's Board approved a CAMP4W Implementation Strategy that outlines steps for implementing and institutionalizing climate adaptation at Metropolitan. The components of the CAMP4W Implementation Strategy include: (1) resource-based and policy-based time-bound targets to guide investment decisions; (2) a Climate Adaptation Policy Framework, which comprises five high-level policy statements, which support the Board-identified priority areas of reliability, resilience, financial sustainability, affordability, and equity; (3) a Decision-Making Framework that defines a consistent, stepwise process for assessing projects and programs; (4) an adaptive management approach to monitoring, reporting, and adjusting, including a CAMP4W annual report to track trends and adjust time-bound targets as needed; and (5) implementation timelines, which will lay out key milestones over the next five years. The 2020 IRP scenarios and related reliability assessments are periodically updated and reaffirmed for use in support of the CAMP4W process.

Planning Approach for UWMP

The UWMP, along with the original IRP and its subsequent updates, used a single set of assumptions for the uncertainties that drive supply and demands. In the 2020 IRP Regional Needs Assessment and CAMP4W, Metropolitan explicitly acknowledges that the future is unpredictable and that a scenario planning approach can expand critical thinking by examining multiple plausible futures. This approach will better prepare Metropolitan's service area for the uncertainties that lie ahead. Metropolitan believes this is an improvement over the single outcome approach taken in past IRPs and the UWMP requirements. It is important to emphasize that the scenario planning element of the 2020 IRP complements the IRP planning approach that has evolved since 1996. It is also important to note that the UWMP assumptions fall within the plausible futures contemplated in the IRP. This means that, while the reliability assessments in the UWMP comply with the Act, Metropolitan and its member agencies are contemplating and comparing future conditions that are beyond the requirements of the Act and thus will be prepared for a wider range of conditions than shown in the UWMP assessments. The following sections describe the methodology and assumptions being applied for the purposes of the UWMP.

2.2 Estimating Demands on Metropolitan

The Urban Water Management Planning Act requires suppliers to conduct three key basic planning analyses to evaluate supply reliability. The first is a water service reliability assessment that compares the total water supply sources available to the water supplier with the long-term projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The second is a drought risk assessment (DRA) that evaluates a drought period that lasts five consecutive water years, starting from the year following when the assessment is conducted. And third, a Water Shortage Contingency Plan (WSCP) that includes a detailed proposal for how the supplier intends to act during actual water shortage conditions. Suppliers need to present the WSCP as part of their UWMP. However, the WSCP is its own independent plan that shall be adopted and provided to customers, cities, and counties within the supplier's service area, and may be amended independent of a supplier's UWMP. These required assessments and planning are included in Chapters 2.3, 2.4, and 2.5.

The 2025 UWMP presents Metropolitan's water reliability assessments from 2030 through 2050. As specified in the Act, there are three-year types that must be included in the water service reliability assessment for the UWMP. To simulate hydrologic conditions for the required reliability assessments, Metropolitan assumed the following:

- Normal Year – The average of historical years 1922 to 2021 most closely represents the water supply conditions that Metropolitan considers available during a normal year.
- Single Dry Year – The conditions for the year 1977 represent the lowest water supply available to Metropolitan.
- Five-Consecutive-Year Drought – The five consecutive years of 1988 to 1992 represent the driest five-consecutive year historical sequence for Metropolitan's water supply. This five-year sequence is used to complete both Metropolitan's water service reliability and drought risk assessments.

Metropolitan developed estimates of future demands and supplies from local sources and from Metropolitan sources based on 100 years (1922-2021) of historic hydrologic conditions. The 100-year period starting in 1922 was chosen because the CalSim 3 model used in the 2025 SWP Delivery Capability Report began in 1922. Supply and demand analyses for the single-dry year and five-year drought cases were based on conditions affecting the SWP as this supply availability fluctuates the most among Metropolitan's sources of supply. Using the same 100-year period of the SWP supply availability, 1977 is the single driest year, and 1988 through 1992 are the five consecutive driest years for SWP supplies to Metropolitan. In addition, staff analysis of the 8-River Index indicated that 1977 is the single driest year and 1988 through 1992 were the lowest five consecutive dry years from 1922 through 2021. The 8-River Index is used widely by the California Department of Water Resources (DWR) and other water agencies as an estimate of the unimpaired runoff (or natural water production) of the Sacramento and San Joaquin River basins, which are sources of water for the SWP.

Demand Projection for the UWMP

Metropolitan developed its demand projections for the UWMP by first estimating total retail demands for its service area and then factoring out water savings attributed to conservation.[1] Projections of local supplies were then derived using data from current and expected local supply programs. The resulting difference between total demands net of savings from conservation and local supplies is the expected regional demands on Metropolitan supplies. These various estimates are shown in Tables 2-1 through 2-3. Major categories used in these tables are defined below.

Total Demands

Total demands are the sum of retail demand for M&I and agricultural, seawater barrier demand, and replenishment demand. Total demands represent the total amount of water needed by the member agencies. Total demands include:

- Retail Municipal and Industrial (M&I) Demand – Retail M&I demands represent urban water use. These include residential, commercial, industrial, and institutional. Demographic and economic factors are the major drivers behind M&I water demands. The demographic and economic data used in developing these projections for the UWMP were from the Southern California Association of Governments' (SCAG) 2024-2050 Regional Transportation Plan/Sustainable Communities Strategy and from the San Diego County Association of Governments' (SANDAG) 2025 Regional Transportation Plan Series 15. The SCAG and SANDAG regional growth forecasts are the core assumptions that drive the estimating equations in Metropolitan's Econometric Demand Model (MWD-EDM).

  SCAG's and SANDAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are backed by Environmental Impact Reports. Both SCAG and SANDAG prepare demographic forecasts based on land use data for their respective regions through extensive processes that emphasize input from local planners and are done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. These growth forecasts are used to guide the development of regional plans and strategies mandated by federal and state governments. Metropolitan's use of SCAG and SANDAG projections is consistent with CWC Section 10631's requirement for suppliers to include current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning. Impacts of potential annexation are not included in the demand projections for the 2025 UWMP.

- Retail Agricultural Demand – Retail agricultural demands consist of water use for irrigating crops. Member agencies with agricultural demand estimate water use based on many factors, including farm acreage, crop types, historical water use, and land use conversion. Each member agency estimates its agricultural demand differently, depending on the availability of information. Metropolitan relies on member agencies' estimates of agricultural demands for the 2025 UWMP. Agricultural demands are considered consumptive demands for modeling purposes.

[1] Information generated as part of this analysis is contained in Appendix 1.

- Seawater Barrier Demand – Seawater barrier demands represent the amount of water needed to hold back seawater intrusion into the coastal groundwater basins. Groundwater management agencies determine the barrier requirements based on groundwater levels, injection wells, and regulatory permits. Seawater barrier demands are not included as part of consumptive demands for modeling purposes.
- Replenishment Demand – Replenishment demands represent the amount of water member and groundwater agencies plan to use to replenish their groundwater basins or surface reservoirs in order to maintain sustainable basin/reservoir health and production. Replenishment deliveries are not included as part of consumptive demands for modeling purposes.

Climate impacts to M&I and agricultural demands are captured using climate adjustment factors called weather bumps. These factors were estimated using the observed range of impacts that weather variables like precipitation and temperature had on consumptive demands. Metropolitan uses hydrologic conditions from 1922 to 2021, consistent with modeling assumptions used with the Integrated Water Resources Plan Simulation Model (IRPSIM) described below. By incorporating these factors, Metropolitan's demand projections capture the range of plausible outcomes based on water use responses to different climate outcomes.

For additional information on Metropolitan's demand forecast, see Appendix 1.

Accounting for Water Conservation

Water savings from conservation reduces total retail demand.[2] Conservation savings consists of the following:

- Code-Based Conservation – Water savings resulting from plumbing codes and water efficiency measures. Code-based conservation occurs as a matter of course without financial incentives from water agencies.
- Active Conservation – Water saved as a direct result of programs and practices directly funded by a water utility like Metropolitan's Conservation Credits Program (CCP). Active conservation is unlikely to occur without agency action.
- Price Effect Conservation – Reductions in customer water use attributed to changes in the cost of water – customer uses less water as water becomes more expensive.
- Pre-1990 Savings – Conservation savings are estimated from a base-year water-use profile. 1980 serves as the base year for estimating conservation savings because it marked the effective change of the plumbing code in California requiring toilets in new construction to be rated at 3.5 gallons per flush (GPF) or less (from 5 to 7 GPF). Within Metropolitan's planning framework, the pre-1990 savings refers to a period between 1980 and 1990, where in Metropolitan's service area, it is estimated to have saved approximately 250 TAF per year as the result of the 1980 plumbing code and water rate increases.

Conservation savings estimates include savings from active conservation (Metropolitan's CCP), code-based conservation, price effect conservation, and pre-1990 device retrofits.

[2] Additional information is contained in Appendix 6.

The savings estimates do not include savings from member agencies' conservation programs that do not participate in Metropolitan's CCP. The estimates also do not include savings from the implementation of future conservation activities.

Local Supplies

Local supplies represent water produced or imported independently by the member agencies and other local water agencies within Metropolitan's service area. Local supplies are a key component in determining how much Metropolitan supply is needed. Projections of local supplies relied on information gathered from several sources including Metropolitan's annual local supply survey, and communications between Metropolitan and member agency staff, and their urban water management plans. Local supplies include:

- Groundwater – Groundwater consists of extractions from local groundwater basins. Groundwater production is supported by captured stormwater and active recharge of recycled and imported water.
- Surface Water – Surface water comes from stream diversions and rainwater captured in rivers and reservoirs.
- Los Angeles Aqueduct – A major source of imported water is conveyed from the Owens Valley via the Los Angeles Aqueduct (LAA) by the Los Angeles Department of Water and Power (LADWP). Although LADWP imports water from outside of Metropolitan's service area, Metropolitan classifies water provided by the LAA as a local resource because it is developed and controlled independently by a local agency.
- Seawater Desalination – Seawater treated to potable standards through advanced desalination processes.
- Recycled Water – Wastewater treated for non-potable consumptive use or indirect potable use through groundwater replenishment and reservoir augmentation.
- Groundwater Recovery – Projects that treat groundwater degraded by pollutants or naturally high salinity to restore it to potable standards.

The local supply projections presented in the demand tables were compiled through the extensive coordination process between Metropolitan and its member agencies for their respective UWMPs.[3,4] Information regarding the member agencies' local supply projections was compiled through the extensive coordination process between Metropolitan and its member agencies. Additionally, Metropolitan maintains an inventory of member agency local supply projects that have been identified within Metropolitan's service area. Appendix

[3] One variation from the member agency local supply reporting is the Colorado River conserved water SDCWA secured from IID, Coachella Canal Lining Project and All-American Canal Lining Project, because SDCWA exchanges that water with Metropolitan pursuant to the parties' Exchange Agreement for an equal amount of Metropolitan water deliveries (exchange water deliveries). (See Chapter 1.) In that exchange, SDCWA transfers the conserved water to Metropolitan at Lake Havasu where it becomes Metropolitan water like all other Metropolitan Colorado River water. In exchange, SDCWA is entitled to Metropolitan water deliveries, which can be from any source like all other Metropolitan full-service water deliveries.

[4] Another variation from the member agency local supply reporting is the hydrology used for projecting future Los Angeles Aqueduct supply. For the 2025 UWMP, LADWP uses a 30-year median hydrology from fiscal years 1990-91 to 2019-20, while Metropolitan uses calendar years 1922 to 2021 hydrology provided by LADWP, consistent with Metropolitan's modeling framework. In a single dry year, LADWP uses fiscal year 2020-21 hydrology while Metropolitan uses calendar year 1977 hydrology. For five consecutive dry years, LADWP uses fiscal years 2011-12 to 2015-16 hydrology while Metropolitan uses calendar years 1988 to 1992 hydrology.

5 contains the inventory of local supply projects by type of supply and includes a classification that shows the current stage of development for each supply in the inventory. The stages of development included in Appendix 5 are: Existing, Under Construction, CEQA Complete, CEQA In Progress, and Conceptual projects. The project inventory in Appendix 5 was updated and completed as part of the annual local supply survey completed by Metropolitan's member agencies in 2025.

Determining Demands on Metropolitan

Metropolitan serves imported water to its 26 member agencies. Most member agencies have other sources of water produced locally from groundwater basins, surface reservoirs, the LAA, recycled water projects, groundwater recovery projects, and seawater desalination projects. When local supplies are not enough to meet retail demands, member agencies purchase supplemental water from Metropolitan.

In determining demands for imported water, Metropolitan developed its Sales Model to calculate the difference between total forecasted retail demands and local supply projections on a per-member agency basis. The balance is the demand on Metropolitan's imported water supply. The Sales Model calculates the difference between forecasted demands and projected local supplies after factoring in climate impacts to both demand and local supply. The Sales Model employs a modeling method using historical hydrologic conditions from 1922 to 2021 to simulate the expected demands on Metropolitan supplies based on hydrologic conditions. Each hydrologic condition results in one possible outcome for the forecast year in the planning horizon. For example, each forecast year, such as 2030, has 100 possible outcomes, one for each historical hydrology year during the period 1922 to 2021. This method of modeling produces a distribution of outcomes ranging from the driest to the wettest years within this historical period.

The Sales Model forecasts three types of demands on Metropolitan:

1. Consumptive Use – Metropolitan's supplies that are used to meet retail M&I and agricultural demand.
2. Seawater Barrier – Imported water needed to prevent seawater intrusion into the coastal groundwater basins.
3. Replenishment – Water for groundwater or reservoir replenishment, when available, to meet imported replenishment demands.

Due to differences in data and modeling methodology, the results of Metropolitan's forecast are not directly comparable to member agencies' forecasts. Differences from the member agencies' forecasts are not cumulative and can offset each other on the regional level. The overall impact is within the range of Metropolitan's supply capability under all year types.

Table 2-1
Metropolitan Regional Water Demands
Normal Year
(acre-feet)

		2030	2035	2040	2045	2050
A.	**Total Demands[1]**	**4,982,000**	**5,120,000**	**5,226,000**	**5,316,000**	**5,412,000**
	Retail Municipal and Industrial[2]	4,507,000	4,639,000	4,740,000	4,833,000	4,921,000
	Retail Agricultural	123,000	119,000	114,000	114,000	114,000
	Seawater Barrier	65,000	67,000	67,000	67,000	67,000
	Groundwater Replenishment	288,000	296,000	305,000	303,000	310,000
B.	**Total Conservation**	**1,171,000**	**1,223,000**	**1,289,000**	**1,357,000**	**1,419,000**
	Existing Active (through 2025)[3]	71,000	42,000	31,000	21,000	5,000
	Code-based	607,000	644,000	673,000	695,000	711,000
	Price-Effect	244,000	286,000	335,000	392,000	454,000
	Pre-1990 Conservation[4]	250,000	250,000	250,000	250,000	250,000
C.	**Total Local Supplies**	**2,584,000**	**2,661,000**	**2,676,000**	**2,682,000**	**2,702,000**
	Groundwater	1,223,000	1,240,000	1,248,000	1,254,000	1,260,000
	Surface Water	90,000	74,000	76,000	76,000	76,000
	Los Angeles Aqueduct[5]	204,000	202,000	200,000	198,000	197,000
	Seawater Desalination	56,000	56,000	56,000	56,000	56,000
	Groundwater Recovery	142,000	143,000	144,000	144,000	144,000
	Total Recycling[6]	574,000	652,000	657,000	661,000	675,000
	Other Imported Supplies[7]	294,000	294,000	294,000	294,000	294,000
D.	**Total Metropolitan Demands**	**1,228,000**	**1,237,000**	**1,261,000**	**1,277,000**	**1,291,000**
	Consumptive Use	1,151,000	1,161,000	1,175,000	1,190,000	1,204,000
	Seawater Barrier	6,000	6,000	6,000	6,000	6,000
	Replenishment	70,000	70,000	80,000	80,000	80,000

Notes:
All units are acre-feet unless specified, rounded to the nearest thousand. Totals may not sum due to rounding.

1. Total Demands is pre-conservation.
2. Retail M&I Demand projections are based on SCAG RTP/SCS 2024 and SANDAG Series 15 demographic growth forecasts.
3. Active conservation base year is 1990. Savings do not include future active conservation after 2025.
4. Pre-1990 conservation captures savings from changes to the Plumbing Code requiring toilets in new construction to be rated at 3.5 gallons per flush or less (from 5 to 7 GPF).
5. Los Angeles Aqueduct Projection uses 1922-2021 hydrology.
6. Excludes Santa Ana River base flow, which is used for recharge of the Orange County Groundwater Basin and reflected in the groundwater production numbers.
7. Conserved Water and Canal Lining Water per SDCWA-IID Transfer Agreement and San Luis Rey Indian Water Rights Settlement Act supplemental water.

Table 2-2
Metropolitan Regional Water Demands
Single Dry Year
(acre-feet)

		2030	2035	2040	2045	2050
A.	**Total Demands[1]**	**4,973,000**	**5,110,000**	**5,215,000**	**5,306,000**	**5,402,000**
	Retail Municipal and Industrial[2]	4,496,000	4,628,000	4,730,000	4,822,000	4,910,000
	Retail Agricultural	122,000	118,000	113,000	113,000	113,000
	Seawater Barrier	65,000	67,000	67,000	67,000	67,000
	Groundwater Replenishment	289,000	297,000	306,000	305,000	311,000
B.	**Total Conservation**	**1,171,000**	**1,223,000**	**1,289,000**	**1,357,000**	**1,419,000**
	Existing Active (through 2025)[3]	71,000	42,000	31,000	21,000	5,000
	Code-based	607,000	644,000	673,000	695,000	711,000
	Price-Effect	244,000	286,000	335,000	392,000	454,000
	Pre-1990 Conservation[4]	250,000	250,000	250,000	250,000	250,000
C.	**Total Local Supplies**	**2,450,000**	**2,521,000**	**2,538,000**	**2,546,000**	**2,567,000**
	Groundwater	1,226,000	1,235,000	1,241,000	1,247,000	1,254,000
	Surface Water	89,000	75,000	80,000	79,000	79,000
	Los Angeles Aqueduct[5]	62,000	61,000	61,000	60,000	60,000
	Seawater Desalination	62,000	62,000	62,000	62,000	62,000
	Groundwater Recovery	142,000	143,000	144,000	144,000	144,000
	Total Recycling[6]	574,000	652,000	657,000	661,000	675,000
	Other Imported Supplies[7]	294,000	294,000	294,000	294,000	294,000
D.	**Total Metropolitan Demands**	**1,352,000**	**1,366,000**	**1,389,000**	**1,403,000**	**1,415,000**
	Consumptive Use	1,274,000	1,289,000	1,301,000	1,315,000	1,328,000
	Seawater Barrier	6,000	6,000	6,000	6,000	6,000
	Replenishment	71,000	71,000	81,000	81,000	81,000

Notes:
All units are acre-feet unless specified, rounded to the nearest thousand. Totals may not sum due to rounding.

1. Total Demands is pre-conservation.
2. Retail M&I Demand projections are based on SCAG RTP/SCS 2024 and SANDAG Series 15 demographic growth forecasts.
3. Active conservation base year is 1990. Savings do not include future active conservation after 2025.
4. Pre-1990 conservation captures savings from changes to the Plumbing Code requiring toilets in new construction to be rated at 3.5 gallons per flush or less (from 5 to 7 GPF).
5. Los Angeles Aqueduct Projection uses 1977 hydrology.
6. Excludes Santa Ana River base flow, which is used for recharge of the Orange County Groundwater Basin and reflected in the groundwater production numbers.
7. Conserved Water and Canal Lining Water per SDCWA-IID Transfer Agreement and San Luis Rey Indian Water Rights Settlement Act supplemental water.

Table 2-3
Metropolitan Regional Water Demands
Drought Lasting Five Consecutive Years
(acre-feet)

		2030	2035	2040	2045	2050
A.	**Total Demands[1]**	**4,878,000**	**5,141,000**	**5,263,000**	**5,361,000**	**5,452,000**
	Retail Municipal and Industrial[2]	4,444,000	4,656,000	4,777,000	4,874,000	4,962,000
	Retail Agricultural	130,000	123,000	118,000	116,000	116,000
	Seawater Barrier	64,000	66,000	67,000	67,000	67,000
	Groundwater Replenishment	240,000	296,000	301,000	304,000	307,000
B.	**Total Conservation**	**1,171,000**	**1,223,000**	**1,289,000**	**1,357,000**	**1,419,000**
	Existing Active (through 2025)[3]	71,000	42,000	31,000	21,000	5,000
	Code-based	607,000	644,000	673,000	695,000	711,000
	Price-Effect	244,000	286,000	335,000	392,000	454,000
	Pre-1990 Conservation[4]	250,000	250,000	250,000	250,000	250,000
C.	**Total Local Supplies**	**2,394,000**	**2,531,000**	**2,570,000**	**2,580,000**	**2,595,000**
	Groundwater	1,212,000	1,237,000	1,249,000	1,255,000	1,261,000
	Surface Water	83,000	79,000	76,000	77,000	77,000
	Los Angeles Aqueduct[5]	92,000	92,000	91,000	90,000	89,000
	Seawater Desalination	57,000	62,000	62,000	62,000	62,000
	Groundwater Recovery	136,000	143,000	144,000	144,000	144,000
	Total Recycling[6]	520,000	625,000	655,000	659,000	669,000
	Other Imported Supplies[7]	294,000	294,000	294,000	294,000	294,000
D.	**Total Metropolitan Demands**	**1,314,000**	**1,388,000**	**1,404,000**	**1,423,000**	**1,437,000**
	Consumptive Use	1,259,000	1,312,000	1,322,000	1,337,000	1,352,000
	Seawater Barrier	8,000	6,000	6,000	6,000	6,000
	Replenishment	46,000	70,000	76,000	80,000	80,000

Notes:
All units are acre-feet unless specified, rounded to the nearest thousand. Totals may not sum due to rounding.

1. Total Demands is pre-conservation.
2. Retail M&I Demand projections are based on SCAG RTP/SCS 2024 and SANDAG Series 15 demographic growth forecasts.
3. Active conservation base year is 1990. Savings do not include future active conservation after 2025.
4. Pre-1990 conservation captures savings from changes to the Plumbing Code requiring toilets in new construction to be rated at 3.5 gallons per flush or less (from 5 to 7 GPF).
5. Los Angeles Aqueduct Projection uses 1988-1992 hydrology.
6. Excludes Santa Ana River base flow, which is used for recharge of the Orange County Groundwater Basin and reflected in the groundwater production numbers.
7. Conserved Water and Canal Lining Water per SDCWA-IID Transfer Agreement and San Luis Rey Indian Water Rights Settlement Act supplemental water.

2.3 Water Reliability Assessment

After estimating demands for a normal year, a single dry year, and droughts lasting at least five years, the water reliability assessment for the UWMP requires urban water suppliers to identify projected supplies to meet these demands. Table 2-4 summarizes the sources of supply for a normal year, while Table 2-5 summarizes the sources of supply for the single dry year (1977 hydrology). Table 2-6 shows the region's ability to respond in future years under a repeat of the 1988-92 drought period lasting five consecutive years and provides results for the average of the five consecutive dry-year period rather than a year-by-year detail. Over the years, Metropolitan has developed numerous programs to increase its water supply capabilities, dry-year supplies, and regional storage. These programs may be exercised in conjunction with effective demand management measures during drought years. Under this reliability planning, if a five consecutive year drought sequence were to repeat, Metropolitan could exercise similar supply augmentation and demand management options for each of the five drought years at the appropriate level to meet demands. This methodology best captures Metropolitan's complex demand and supply planning with appropriate flexibility. Table 2-4 reports assessment under a normal year represented by the average of the 100 historical hydrologies from 1922-2021. Appendix 2 provides a detailed description of the existing regional water supplies, and Appendix 3 contains detailed justifications for the sources of supply used for this analysis.

Metropolitan's supply capabilities are evaluated using the following assumptions:

Colorado River Supplies

Colorado River supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA (also a QSA-related agreement). The QSA established the baseline water use for each of the agreement parties and facilitates the transfer of water from agricultural agencies to urban uses. Since the QSA, additional programs have been implemented to increase Metropolitan's supplies. These include the Palo Verde Irrigation District (PVID) Land Management, Crop Rotation, and Water Supply Program, as well as the Lower Colorado River Water Supply Project. The 2007 Interim Guidelines provided for the coordinated operation of Lake Powell and Lake Mead, as well as the Intentionally Created Surplus (ICS) program that allows Metropolitan to store water in Lake Mead. These stored supplies can be used to supply additional water to ensure that, when needed, Metropolitan can deliver up to the CRA capacity of 1.25 MAF. A detailed discussion of the QSA is included in Chapter 3.1 and Appendix 3.1.

In light of declining reservoir levels, the Lower Basin Drought Contingency Plan (DCP) was signed in 2019. This agreement incentivizes storage in Lake Mead and requires certain volumes of water be stored in Lake Mead under certain Lake Mead elevation levels through 2026. Metropolitan is to store certain volumes of water in Lake Mead as DCP ICS once Lake Mead is below elevation 1,045 feet. This agreement also increases Metropolitan's flexibility to take delivery of water stored as ICS at Lake Mead elevations below 1,075 feet. The goal of this agreement is to keep Lake Mead above critical elevations, and overall, it

increases Metropolitan's flexibility to store water in Lake Mead in greater volumes and to take delivery of stored water to fill the CRA as needed.

The 2007 Interim Guidelines governing Lower Basin shortages and the operations of Lakes Mead and Powell are set to expire in 2026, and new operating guidelines will need to be developed for 2027 and beyond. At the time of this report, negotiations over the successor post-2026 guidelines are ongoing, and the outcome is highly uncertain. However, it is anticipated that California will likely be required to reduce its supplies from the Colorado River, on average, under the new guidelines, and that as the junior priority, Metropolitan is at risk. A final EIS with a Selected Alternative is expected in the summer of 2026 with a record of decision to follow.

Colorado River supplies for the 2025 UWMP are modeled using the same primary logic as the United States Bureau of Reclamation's (USBR) Colorado River Simulation System (CRSS) model. For this reliability assessment, Metropolitan used the Lake Mead and Lake Powell inflows USBR included in its official August 2023 CRSS run, which is the latest available at the time of production of this plan. A moderate climate change factor was then applied that reduces Lake Mead and Lake Powell inflows through the life of the forecast. This climate change factor is equivalent to a 9.3 percent decrease in flows for every degree Celsius increase. This methodology was adopted during the 2020 IRP Regional Needs Assessment process, and the climate change impacts are consistent with the modeled impacts to SWP deliveries. The 2025 UWMP assumes continuation of current operating agreements through the planning horizon.

State Water Project Supplies

DWR prepares a biennial SWP Delivery Capability Report (DCR) to assist SWP contractors and local planners in assessing the availability of supplies from the SWP. DWR issued its most recent update, the draft 2025 DCR, in December 2025. In this update, DWR provided SWP supply estimates for SWP contractors to use in their planning efforts, including for use in their 2025 UWMPs. The draft 2025 DCR includes DWR's estimates of SWP water supply availability under both existing (2025) and future conditions (2043).

DWR's estimates of SWP deliveries are based on the CalSim 3 computer model that simulates monthly operations of the SWP and Central Valley Project (CVP) systems. Key inputs to the model include the facilities included in the system, hydrologic inflows to the system, regulatory and operational constraints on system operations, and contractor demands for both CVP and SWP water. In conducting its model studies, DWR must make assumptions regarding each of these key inputs.

In the draft 2025 DCR for its model study under existing conditions, DWR assumed: existing facilities, hydrologic inflows to the model based on 100 years of adjusted historical inflows (1921 through 2021) recent changes to climate, current regulatory and operational constraints including 2018 COA Amendment, 2024 biological opinions and 2024 SWP Incidental Take Permit, and SWP contractor demands at maximum Table A Amounts. The long-term average allocation reported in the draft 2025 DCR for the existing conditions study provides an appropriate estimate of the SWP water supply availability under current conditions.

To evaluate SWP supply availability under future conditions, the draft 2025 DCR included three model studies representing hydrologic and sea level rise conditions at 2043. The future condition studies used all of the same model assumptions as the study under existing conditions, but reflected changes expected to occur from climate change, specifically, projected temperature and precipitation changes centered around 2043 (2028 to 2057) and sea level rise. The three risk-informed climate scenarios (50 percent, 75 percent, and 95 percent level of concern) for the year 2043 included in the draft 2025 DCR provide explicit representation of climate change uncertainties and improved transparency and information for local planners. The level of concern is defined based on projected climate-informed system performance levels of April-to-July unimpaired runoff (Eight River Index) in the Delta watershed. The 50 percent level of concern scenario represents a middle-of-the-road or central tendency future at 2043 for the SWP. The 75 percent level of concern scenario represents a worse-than-average future for the SWP, and the 95 percent level of concern represents much worse. In other words, a 95 percent level of concern scenario depicts a future condition in which 95 percent of model-informed climate outcomes result in better SWP system reliability. For the long-term planning purposes of this UWMP, the long-term average allocations reported for the 50 percent level of concern 2043 study from the draft 2025 DCR is the most appropriate estimate of average future SWP water supply availability. The 75 percent and 95 percent level of concern studies can be used to further understand the sensitivity of the water supply portfolio to the projected changes in the future SWP supplies.

Since this UWMP uses DWR's draft 2025 DCR to estimate future SWP supplies, any changes in supply reliability that would result from new facilities proposed under the Delta Conveyance Project and Sites Reservoir are not included in the following tables. These estimates incorporate restrictions on SWP and Central Valley Project (CVP) operations in accordance with water quality objectives established by the State Water Resources Control Board, the biological opinions of the U.S. Fish and Wildlife Service issued on November 8, 2024, biological opinions of the National Marine Fisheries Service issued on December 6, 2024, and the Incidental Take Permit issued by the California Department of Fish and Wildlife on November 4, 2024. In addition, these estimates incorporate amendments to the Coordinated Operations Agreement between the Central Valley Project and the State Water Project made in 2018. Under the 2025 DCR—climate-adjusted current condition scenario—the delivery estimates for the SWP for 2025 conditions as a percentage of Table A amounts are 54 percent, equivalent to 1,034 TAF for Metropolitan under a long-term average condition, and 5 percent under a single dry-year (1977) condition, equivalent to 97 TAF for Metropolitan. To ensure consideration of climate change impacts, the 50 percent Level of Concern (50LOC) future condition as described in the 2025 DCR was also utilized in the analysis. The 50LOC scenario represents a 2043 middle-of-the-road or central tendency future for the SWP and includes: a 1.5 degrees Celsius temperature increase over current average temperatures, 1.5 percent wetter than average, and 15 centimeters (cm) of sea level rise. The 50LOC delivery estimates for the SWP for 2025 conditions as a percentage of Table A amounts are 48 percent, equivalent to 926 TAF for Metropolitan under a long-term average condition, and one percent under a single dry-year (1977) condition, equivalent to 28 TAF for Metropolitan. The development of the future climate change scenarios is fully described in the Risk-Informed Future Climate Scenario

Development for SWP DCR (California Department of Water Resources, 2023). Detailed descriptions of SWP supply programs are included in Chapter 3.2 and Appendix 3.2.

In May 2025, DWR published a technical addendum to the 2023 DCR describing the impact of subsidence to future SWP deliveries. The study showed that SWP deliveries could be significantly reduced by future subsidence. DWR recommends using the 2025 DCR to support long-term planning efforts because DWR has planned near-term fixes and is committed to restore the conveyance capacity of the California Aqueduct. Metropolitan will continue to stay informed and incorporate any suitable subsidence modeling in the future. For a discussion of subsidence, please see Chapter 3.2.

In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs. Over the years, under the pumping restrictions of the SWP, Metropolitan has collaborated with the other contractors to develop numerous voluntary Central Valley/SWP storage and transfer programs. The goal of these storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the California Aqueduct during dry hydrologic conditions and regulatory restrictions. Descriptions of these storage and transfer programs are included in Chapter 3.3 and Appendix 3.2.

Lowest SWP Water Supply Allocation Assumption

DWR's 2023 DCR indicated that the modeled single dry year SWP water supply allocation is four percent, and the draft 2025 Delivery Capability Report indicated six percent under the existing conditions. Historically the lowest SWP allocations were at five percent in 2014, 2021, and 2022. Due to extraordinarily dry conditions in 2021 and 2022, the initial 2022 SWP allocation was a historically low zero percent of Table A amounts, but was ultimately increased to five percent in March 2022, the lowest ever final total SWP water supply allocation. Historic dry conditions led to the low SWP water supply allocations in 2021 and 2022. Such conditions, although possible, likely have a low probability of occurrence. The draft 2025 Delivery Capability Report, which takes into account the recent changes in the climate, indicates an 11 percent probability of annual SWP Table A deliveries between 0–500 TAF, which translates to allocations of 12 percent or less.

Each year by October 1, SWP contractors submit their requests for SWP supplies for the following calendar year. By December 1, DWR estimates the available water supply for the following year and sets an initial supply allocation based on the total of all contractors' requests, current reservoir storage, forecasted hydrology through the next year, and target reservoir storage for the end of the next year. The most uncertain of these factors is the forecasted hydrology. In setting water supply allocations, DWR uses a conservative 90 percent hydrologic forecast, where nine out of ten years will be wetter and one out of ten years drier than assumed. DWR reevaluates its estimate of available supplies throughout the runoff season of winter and early spring, using updated reservoir storage and hydrologic forecasts, and revises SWP supply allocations as warranted. Since most of California's annual precipitation falls in the winter and early spring, by the end of spring the supply available for the year is much more certain, and in most years DWR issues its final SWP allocation by this time. While most of the water supply is certain by this time, runoff in the late fall remains somewhat variable as the next year's runoff season begins. A drier-

than-forecasted fall can result in not meeting end-of-year reservoir storage targets, which means less water available in storage for the following year.

California is known to experience the highest inter-annual variability in hydrology across the entire United States. While droughts occur, with science-based adjustments to regulatory requirements and better water management to take advantage of the wetter periods that occur, even in drought years SWP water supply reliability is expected to improve. Thus, the assumption for SWP contractors, including Metropolitan, is that a five percent allocation represents a reasonable planning representation of a low probability, worst-case scenario.

Storage

A key component of Metropolitan's water supply capability is the amount of water in storage facilities accessible to Metropolitan. Since the 1990s, Metropolitan has developed a large regional storage portfolio that includes both dry-year and emergency storage capacity. Storage is a key component of water management. Storage enables the capture of surplus amounts of water in normal and wet hydrologic conditions when it is plentiful for supply and environmental uses. Stored water can then be used in dry years and in conditions where augmented water supplies are needed to meet demands. Metropolitan's resource analysis model considers all the capacities and constraints of its storage facilities and programs and simulates the fill and withdrawal of these facilities through the 100 hydrologic conditions from 1922 to 2021. In-region storage and supply programs are discussed in detail in Chapter 3.6 and Appendix 3.3.

Interpreting Metropolitan's Reliability Assessment and Supply Capabilities in the UWMP

Metropolitan's long-term water service reliability assessment performed for the UWMP shows that, under required and stated assumptions and the conditions required by the Act, there would be supply and storage capabilities, and projected surplus supplies, sufficient to meet projected demands from 2030 to 2050. This assessment applies under a normal year, a single dry year, and five consecutive drought year conditions as specified by the Act. However, this assessment should be considered as addressing the specific conditions and assumptions stated in the UWMP and is not inclusive of a fuller range of assumptions and conditions that are considered in the 2020 IRP Regional Needs Assessment and CAMP4W, which are Metropolitan's primary long-term water supply reliability planning processes. To address the uncertainties and planning parameters in the IRP and CAMP4W, additional supply and demand management measures may be identified and developed and implemented that are outside of the needs and capabilities indicated by the UWMP reliability assessments.

Table 2-4
Normal Year
Supply Capability[1] and Projected Demands
Average of 1922-2021 Hydrologies
(acre-feet per year)

Forecast Year	2030	2035	2040	2045	2050
Current Programs					
In-Region Supplies and Programs	791,000	774,000	744,000	730,000	857,000
California Aqueduct[2]	1,723,000	1,694,000	1,668,000	1,641,000	1,641,000
Colorado River Aqueduct					
Total Supply Available[3]	1,334,700	1,358,200	1,336,000	1,323,500	1,345,500
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**3,764,000**	**3,718,000**	**3,662,000**	**3,621,000**	**3,748,000**
Demands					
Total Demands on Metropolitan[5]	1,244,000	1,253,000	1,277,000	1,293,000	1,307,000
Exchange with SDCWA	278,000	278,000	278,000	278,000	278,000
Total Metropolitan Deliveries	**1,522,000**	**1,531,000**	**1,555,000**	**1,571,000**	**1,585,000**
Surplus	**2,242,000**	**2,187,000**	**2,107,000**	**2,050,000**	**2,163,000**
Programs Under Development					
In-Region Supplies and Programs	0	0	0	0	0
California Aqueduct	0	0	0	0	0
Colorado River Aqueduct					
Total Supply Available[3]	0	0	0	0	0
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**0**	**0**	**0**	**0**	**0**
Potential Surplus	**2,242,000**	**2,187,000**	**2,107,000**	**2,050,000**	**2,163,000**

Notes:
1. Represents Supply Capability for resource programs under listed year type.
2. California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.
3. Colorado River Aqueduct includes programs and Exchange with SDCWA conveyed by the aqueduct.
4. Maximum CRA deliveries limited to 1.25 MAF including Exchange with SDCWA.
5. Total demands include 16 TAF per year of San Luis Rey Indian Water Rights Settlement Act supplemental water.

Table 2-5
Single Dry Year
Supply Capability[1] and Projected Demands
Repeat of 1977 Hydrology
(acre-feet per year)

Forecast Year	2030	2035	2040	2045	2050
Current Programs					
In-Region Supplies and Programs	791,000	774,000	744,000	730,000	857,000
California Aqueduct[2]	662,000	649,000	635,000	622,000	622,000
Colorado River Aqueduct					
Total Supply Available[3]	1,334,700	1,358,200	1,336,000	1,411,000	1,433,000
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	1,250,000
Colorado River Aqueduct Capability	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Capability of Current Programs	**2,703,000**	**2,673,000**	**2,629,000**	**2,602,000**	**2,729,000**
Demands					
Total Demands on Metropolitan[5]	1,368,000	1,382,000	1,405,000	1,419,000	1,431,000
Exchange with SDCWA	278,000	278,000	278,000	278,000	278,000
Total Metropolitan Deliveries	**1,646,000**	**1,660,000**	**1,683,000**	**1,697,000**	**1,709,000**
Surplus	**1,057,000**	**1,013,000**	**946,000**	**905,000**	**1,020,000**
Programs Under Development					
In-Region Supplies and Programs	0	0	0	0	0
California Aqueduct	0	0	0	0	0
Colorado River Aqueduct					
Total Supply Available[3]	0	0	0	0	0
Aqueduct Capacity Limit[4]	*0*	*0*	*0*	*0*	*0*
Colorado River Aqueduct Capability	0	0	0	0	0
Capability of Proposed Programs	**0**	**0**	**0**	**0**	**0**
Potential Surplus	**1,057,000**	**1,013,000**	**946,000**	**905,000**	**1,020,000**

Notes:

1. Represents Supply Capability for resource programs under listed year type.
2. California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.
3. Colorado River Aqueduct includes programs and Exchange with SDCWA conveyed by the aqueduct.
4. Maximum CRA deliveries limited to 1.25 MAF including Exchange with SDCWA.
5. Total demands include 16 TAF per year of San Luis Rey Indian Water Rights Settlement Act supplemental water.

Table 2-6
Drought Lasting Five Consecutive Years
Supply Capability[1] and Projected Demands
Repeat of 1988-1992 Hydrology
(acre-feet per year)

Forecast Year	2030	2035	2040	2045	2050
Current Programs					
In-Region Supplies and Programs	160,000	154,000	149,000	146,000	172,000
California Aqueduct[2]	733,200	719,400	690,400	659,400	591,400
Colorado River Aqueduct					
Total Supply Available[3]	1,190,200	1,241,700	1,203,500	1,196,000	1,256,500
Aqueduct Capacity Limit[4]	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*	*1,250,000*
Colorado River Aqueduct Capability	1,190,200	1,241,700	1,203,500	1,196,000	1,250,000
Capability of Current Programs	**2,083,400**	**2,115,100**	**2,042,900**	**2,001,400**	**2,013,400**
Demands					
Total Demands on Metropolitan[5]	1,330,000	1,404,000	1,420,000	1,439,000	1,453,000
Exchange with SDCWA	278,000	278,000	278,000	278,000	278,000
Total Metropolitan Deliveries	**1,608,000**	**1,682,000**	**1,698,000**	**1,717,000**	**1,731,000**
Surplus	**475,400**	**433,100**	**344,900**	**284,400**	**282,400**
Programs Under Development					
In-Region Supplies and Programs	0	0	0	0	0
California Aqueduct	0	0	0	0	0
Colorado River Aqueduct					
Total Supply Available[3]	0	0	0	0	0
Aqueduct Capacity Limit[4]	*59,800*	*8,300*	*46,500*	*54,000*	*0*
Colorado River Aqueduct Capability	*0*	*0*	*0*	*0*	*0*
Capability of Proposed Programs	**0**	**0**	**0**	**0**	**0**
Potential Surplus	**475,400**	**433,100**	**344,900**	**284,400**	**282,400**

Notes:

1. Represents Supply Capability for resource programs under listed year type.
2. California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.
3. Colorado River Aqueduct includes programs and Exchange with SDCWA conveyed by the aqueduct.
4. Maximum CRA deliveries limited to 1.25 MAF including Exchange with SDCWA.
5. Total demands include 16 TAF per year of San Luis Rey Indian Water Rights Settlement Act supplemental water.

2.4 Drought Risk Assessment

CWC Section 10635(b) requires every urban water supplier to include, as part of its urban water management plan, a drought risk assessment (DRA) for its water service as part of information considered in developing its demand management measures and water supply projects and programs. The DRA analysis allows suppliers to consider how to manage their water supplies during stressed hydrologic conditions in relation to variations in demand. The DRA helps a supplier to evaluate the functionality of its WSCP shortage response actions and understand the type and degree of response that is appropriate for managing water supplies. This evaluation can help the supplier to identify risks and take proactive steps before the next actual drought lasting at least five consecutive years.

CWC Section 10612 requires the DRA to be based on the driest five-year historical sequence for the agency's water supply. Furthermore, CWC Section 10635 also requires that the analysis consider plausible changes on projected supplies and demands due to climate change, anticipated regulatory changes, and other locally applicable criteria, and that the DRA start from the year following when the assessment is conducted. For the 2025 UWMP, DRA is developed for years 2026-2030. Accordingly, the 2025 UWMP Guidebook suggests that the historical five driest consecutive years on record may be considered a starting point in the analysis which is informed by other factors and considerations. Suppliers may then use these estimated supply conditions to prepare the DRA analysis, assuming they occur over the next five years.

For Metropolitan, the five consecutive years of 1988-1992 represent the driest five-consecutive year historical sequence for Metropolitan's water supply. Thus, Metropolitan used this five-year historical sequence to complete its DRA. Metropolitan developed estimates of future demands and supplies from local sources and from Metropolitan sources based on 100 years (1922-2021) of historical hydrology. Supply and demand analyses for droughts lasting at least five consecutive years were based on conditions affecting the SWP, as this supply availability fluctuates the most among Metropolitan's sources of supply. Using the same 100-year period of the SWP supply availability, 1988-1992 is the driest five-year historical sequence that represents the lowest water supply available for SWP supplies to Metropolitan. In addition, staff analysis of the 8-River Index indicates that the period 1988-1992 represents the lowest five consecutive dry years from 1922-2021. The 8-River Index is used by DWR and other water agencies as an estimate of the unimpaired runoff (or natural water production) of the Sacramento and San Joaquin River basins, which are sources of water for the SWP.

Water Use Characterization

Metropolitan developed its demand forecast by first estimating total retail demands for its service area and then factoring out water savings attributed to conservation, as shown in Appendix 1. Projections of local supplies were then derived using data from current and expected local supply programs. The resulting difference between total demands net of savings from conservation and local supplies is the expected regional demands on Metropolitan supplies. As explained in detail in Chapter 2.2, Metropolitan used its Sales Model to calculate the difference between total forecasted retail demands and local supply projections. The balance is the demand on Metropolitan that will be met by supplies from Colorado River, SWP, and in-region storage.

Based on the 100 years of historical hydrologic conditions (1922-2021), the five consecutive years of 1988-1992 represent the driest five-consecutive year historical sequence for Metropolitan's water supply and the five consecutive driest years for SWP supplies. Thus, Metropolitan used a repeat of the historical condition of 1988-1992 to assess the near-term drought risk for years 2026-2030. Under this assessment, the historical condition for 1988 is used to forecast the water use for the first year 2026, the historical condition for 1989 is used to forecast the water use for the second year 2027, and so on up to year 2030. Metropolitan's projected water use is presented annually for the next five years in Table 2-7, including the year-by-year change in projected use.

Climate impacts to M&I and agricultural demands are captured using climate adjustment factors. These factors were estimated using observed range of weather variables, precipitation and temperature, on historical consumptive demands. Metropolitan updated these factors to include the most recent weather and climate outcomes and recent changes in water use and irrigation demands. By incorporating these factors, Metropolitan's demand projections are calibrated to more recent water use behaviors and better reflect current climate change impacts.

Supply Characterization

Metropolitan's assumptions for its supply capabilities are discussed and presented in five-year increments under its water reliability assessment in Chapter 2.3. For Metropolitan's DRA, these supply capabilities are further refined and presented annually for the years 2026-2030 by assuming a repeat of historical conditions from 1988 to 1992. This historical five-year sequence represents the lowest water supply available for SWP supplies to Metropolitan.

For its DRA, Metropolitan assessed the reliability of each individual water supply source over the five consecutive year drought through a modeling method using the same historical hydrologic conditions from 1922 to 2021. Also, as part of this DRA, the expected quantity of each water supply source for each year of the five-year drought was evaluated and included within the tabulated capability of each supply category. Metropolitan's supply sources under the Colorado River, SWP, and in-region supply categories are individually listed and discussed in detail in Chapter 3. Future supply capabilities for each of these supply sources are also individually tabulated in Appendix 3, with consideration for plausible changes on projected supplies under climate change conditions, anticipated regulatory changes, and other factors, as explained in Chapter 2.6.

Metropolitan used DWR's analyses of SWP delivery capability which includes climate change impacts to deliveries at a 2043 emission level and 15 cm of sea level rise. This resulted in adjusted delivery capability. These estimates incorporate restrictions on SWP and Central Valley Project (CVP) operations in accordance with water quality objectives established by the State Water Resources Control Board, the biological opinions of the U.S. Fish and Wildlife Service issued on November 8, 2024, biological opinions of the National Marine Fisheries Service issued on December 6, 2024, and the Incidental Take Permit issued by the California Department of Fish and Wildlife on November 4, 2024. In addition, these estimates incorporate amendments to the Coordinated Operations Agreement between the Central Valley Project and the State Water Project made in 2018.

Colorado River supplies for the 2025 UWMP are modeled using the same primary logic as the United States Bureau of Reclamation's (USBR) Colorado River Simulation System (CRSS) model. For this reliability assessment, Metropolitan used the Lake Mead and Lake Powell inflows USBR included in its official August 2023 CRSS run, which is the latest available at the time of production of this plan. A climate change factor was applied to the inflows into Lakes Powell and Mead, characterized by a decrease of inflows associated with increasing temperature in a moderate climate change future.

The supply capabilities presented in Table 2-7 are based on Metropolitan's core supplies of programs within the Colorado River and SWP. Metropolitan's core water supplies are listed in Appendix 4 WSCP Table A.4-3. In addition, Metropolitan has numerous flexible supplies and storage programs within the Colorado River, SWP, and in-region that may be exercised as supply augmentation actions, if needed, consistent with the shortage response actions identified in Metropolitan's WSCP. The supply capabilities of Metropolitan's core, flexible, and storage programs for 2026-2030 are presented in detail in Appendix 3, Table A.3-8.

Total Water Supply and Use Comparison

Metropolitan's DRA is presented in Table 2-7 and provides a comparison of Metropolitan's total water supply and use for the next five years. This table is based on and is an abridged version of DWR's optional Planning Tool. Table 2-7 also includes the DWR Submittal Table 7-5, Five-Year Drought Risk Assessment Table to Address Water Code Section 10635(b). Metropolitan's DRA uses annual total comparisons of its water supply and use. For large wholesale suppliers, like Metropolitan, it is more practicable to use annual rather than monthly values. Core supply sources are annually assessed and depend on unpredictable hydrology, such as the SWP, Colorado River, and availability of water transfers, among others.

Metropolitan's near-term assessment reveals that there could be a potential shortfall of core supplies in four of the next five years. This shortfall is largely triggered by the assumed low supply conditions from the SWP under a repeat of the historical condition of 1988-1992, which is modeled at eight percent of Table A allocation for 2026, seven percent for 2028, eight percent for 2029, and 13 percent for 2030. Actual supply conditions for the next five years may prove different from these historic supply conditions. This DRA illustrates Metropolitan's potential shortage response actions if such a shortfall were to happen.

As detailed in Chapter 2.5 and Appendix 4, Metropolitan has a robust Water Shortage Contingency Plan and comprehensive shortage response planning that include demand reduction measures and supply augmentation actions. For years 2026, 2028, 2029, and 2030, the estimated shortfalls from the Colorado River and SWP core supplies are 542 TAF (Level 4), 559 TAF (Level 4), 370 TAF (Level 3) and 288 TAF (Level 2), respectively, with the corresponding WSCP shortage levels indicated in parentheses. Appendix 4 Table A.4-5 presents Metropolitan's response actions for the different shortage levels, which include take from storage, execute flexible supplies, implement voluntary demand reduction, and implement the Water Supply Allocation Plan. Appendix 4 Table A.4-6 further identifies

Metropolitan's supply augmentation actions that may be exercised to mitigate any potential shortage, including withdrawal from available flexible supplies and storage programs.

As detailed in Chapter 3 and Appendix 3, Metropolitan has built its dry-year and emergency storage through partnerships with various entities and investments in infrastructure. As of January 1, 2025, Metropolitan has 3.8 MAF in storage that may be used for dry-year needs. Because dry-year storage is at a record high, Metropolitan may only need to implement supply augmentation actions to meet the potential core supply shortfall. Supply augmentation actions may include exercising Metropolitan's flexible supplies and storage from the Colorado River, SWP, and in-region. In addition to supply augmentation, Metropolitan may also implement demand reduction and operational flexibility as part of its shortage response actions, to preserve storage or under scenarios where dry-year storage levels are not high. The factual shortage response actions, combination of actions selected, and volume of take from supply programs exercised, all depend on the shortage that needs to be met, storage balance of the supply programs, program constraints, and other supply management considerations.

This DRA shows, under the assumptions described in this UWMP, that Metropolitan's total core, flexible, and storage supplies exceed the projected demand on Metropolitan for 2026-2030. This demonstrates Metropolitan's water service reliability for each year of the next five years under a repeat of the driest five-year historical sequence of Metropolitan's water supply. A graphical representation of the DRA is presented in Figure ES-2, as part of the Executive Summary. A portion of Table 2-7 is also presented in Appendix 11 as DWR Submittal Table 7-5.

Table 2-7
Metropolitan's Drought Risk Assessment
Water Use, Supply, and Risk Assessment for 2026 – 2030
(also included as Appendix 11 DWR Submittal Table 7-5)

Submittal Table 7-5 Wholesale: Five-Year Drought Risk Assessment Water Code Section 10635(b)(3)		
2026		**Total**
Total Water Use	(AF)	1,515,000
Total Supplies	(AF)	973,000
Surplus/Shortfall w/o WSCP Action		(542,000)
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit	(AF)	542,000
WSCP - use reduction savings benefit	(AF)	0
Revised Surplus/(shortfall)		0
2027		**Total**
Total Water Use	(AF)	1,639,000
Total Supplies	(AF)	2,267,000
Surplus/Shortfall w/o WSCP Action		628,000
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit	(AF)	0
WSCP - use reduction savings benefit	(AF)	0
Revised Surplus/(shortfall)		628,000
2028		**Total**
Total Water Use	(AF)	1,728,000
Total Supplies	(AF)	1,170,000
Surplus/Shortfall w/o WSCP Action		(558,000)
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit	(AF)	558,000
WSCP - use reduction savings benefit	(AF)	0
Revised Surplus/(shortfall)		0
2029		**Total**
Total Water Use	(AF)	1,567,000
Total Supplies	(AF)	1,197,000
Surplus/Shortfall w/o WSCP Action		(370,000)
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit	(AF)	370,000
WSCP - use reduction savings benefit	(AF)	0
Revised Surplus/(shortfall)		0
2030		**Total**
Total Water Use	(AF)	1,588,000
Total Supplies	(AF)	1,301,000
Surplus/Shortfall w/o WSCP Action		(287,000)
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit	(AF)	287,000
WSCP - use reduction savings benefit	(AF)	
Revised Surplus/(shortfall)		0
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.		
NOTES: Totals may not foot due to rounding. See 2025 UWMP discussion in 2.4 Drought Risk Assessment regarding supply augmentation actions that may be exercised to meet demands through 2030.		

2.5 Water Shortage Contingency Plan

In addition to the water supply reliability analysis addressing normal, dry, and multiple dry years, CWC Section 10632 requires urban suppliers to prepare and adopt a water shortage contingency plan, which includes the shortage response actions that they would take in response to six standard water shortage levels based on water supply conditions and shortages resulting from catastrophic supply interruptions. The Water Shortage Contingency Plan (WSCP) is Metropolitan's plan in the case of an actual water shortage condition. As illustrated in the preceding section's service reliability assessment, Metropolitan has the supply capabilities to meet projected demands during various hydrologic conditions. With such service reliability, Metropolitan's WSCP is part of its resiliency strategy to improve preparedness for droughts and other impacts on water supplies. In fulfillment of the Act's requirements, described below are the WSCP reporting elements that show how Metropolitan will manage and mitigate a water shortage. A copy of Metropolitan's WSCP is provided in Appendix 4.

Water Supply Reliability Analysis

CWC Section 10632(a)(1) directs the WSCP to include an "analysis of water supply reliability conducted pursuant to Section 10635." As shown in the water reliability assessment in Chapter 2.3, Metropolitan anticipates being able to meet water demands with adequate supplies across the single driest year and droughts lasting five consecutive years scenarios through the year 2050. Metropolitan's DRA in Chapter 2.4. anticipates no water service reliability concerns or shortfall mitigation measures will be needed over the next five years, under a repeat of the historical driest five-year sequence of Metropolitan's water supply.

Annual Water Supply and Demand Assessment Procedures

Pursuant to CWC Section 10632(a)(2), Metropolitan must include in its WSCP the procedures used for conducting an annual Water Supply and Demand Assessment (Annual Assessment). The Annual Assessment is a determination of Metropolitan's annual outlook for water supply reliability, and how a perceived shortage may relate to WSCP shortage stage response actions in the current calendar year. This determination will be based on information available to Metropolitan at the time of the analysis. The Annual Assessment is due by July 1 of every year. CWC Section 10632.1 states: "An urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later." The Annual Assessment and related reporting are conducted based on the procedures described in the WSCP.

The Annual Assessment determination is based on considerations of available core water supplies, unconstrained water demand, planned water use, and infrastructure conditions. The difference between projected core water supplies and anticipated unconstrained demand are used to determine what, if any, shortage stage is expected under the WSCP framework. CWC Section10632(a)(2)(B)(ii) requires the Annual Assessment to determine "current year available supply, considering hydrological and regulatory conditions in the current year and one dry year." The Annual Assessment includes two separate estimations of Metropolitan's annual water supply and unconstrained demand using: (1) current year conditions and (2) assumed dry-year conditions based on best-available data. Accordingly,

the Annual Assessment's shortage analysis presents separate sets of findings for the current year and dry year scenarios. The CWC does not specify the characteristics of a dry year, allowing discretion to the Supplier. Metropolitan uses this discretion to refine and update its assumptions for a dry-year scenario in each Annual Assessment as information becomes available. The standard shortage percentage will be calculated by dividing the difference between core supplies and unconstrained demand by unconstrained demand, and will be calculated separately for the anticipated current year condition and the assumed dry-year condition.

By June, Metropolitan staff provides a completed Annual Assessment for approval by the Board's authorized designee with delegated authority for approval of Annual Assessment determinations. Upon approval, Metropolitan staff submits the Annual Assessment to the California Department of Water Resources by July 1.

Six Standard Water Shortage Levels

As required by CWC 10632(a)(3)(A), the WSCP is framed around six standard shortage levels that correspond to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortages. Each of the six shortage levels represents an increasing gap between Metropolitan's estimated core supplies and unconstrained demand as determined in the Annual Assessment. The shortage levels are defined in terms of the percent shortfall of supplies against demand. Shortage levels also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other emergency events.

Shortage Response Actions

CWC 10632(a)(4) directs the WSCP to contain shortage response actions that align with the defined shortage levels, and include:

- Supply Augmentation Actions
- Demand Reduction Actions
- Operational Changes
- Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions (not applicable to Metropolitan as a wholesaler with no retail customers)
- An estimate of the extent to which the gap between supplies and demand will be reduced by implementation of each action.

Metropolitan has invested extensively in a diverse portfolio of supply sources and system resiliency to prepare for a wide range of possible challenging conditions. Metropolitan follows the principles of its Water Surplus and Drought Management (WSDM) Plan, which was adopted in 1999 and provides policy guidance for managing regional water supplies to achieve reliability.

Shortage responses will be customized to meet the circumstances for the particular shortage. Because circumstances can change at any time, Metropolitan's shortage response actions will be adjusted accordingly throughout the year. To determine specific actions that would be taken at each standard shortage level, Metropolitan will evaluate

conditions specific to cost, timing, distribution needs and capabilities, and other variables that include SWP allocation, Colorado River conditions, preexisting demand reduction measures, supply program take capacities, and storage balances.

Supply augmentation actions are comprised of Metropolitan's portfolio of water storage reserves and flexible supply sources that are available on an as-needed basis, such as water from its storage facilities and from transfer and exchange programs. Demand reduction actions are temporary measures that can constrain demand in the current year, such as public information campaigns and mandatory allocations. Operational flexibility actions are an acknowledgement that Metropolitan will adjust its operations as needed during shortages. These adjustments may include temporarily deferring or accelerating scheduled maintenance and planned shutdowns or adjusting the distribution system to compensate for limitations in Colorado River or State Water Project water.

Shortages are characterized not merely by shortfalls in annual core water supplies, but also by the water balances in Metropolitan's storage programs. Thus, a ten percent or even a 50 percent shortfall in core supplies could be met entirely with stored water if storage levels are sufficient to meet demand. If storage levels are already depleted, the same shortfall in core supplies could potentially require a more complex mix of supply augmentation and demand reduction actions. During most years, Metropolitan anticipates that it can meet all or most shortages with supply augmentation actions. Depending on intensity, voluntary demand reduction measures are estimated to reduce retail water usage by up to 20 percent. In the most severe situations, supply allocations to member agencies would address any remaining shortages not already mitigated by supply augmentation and lesser demand reduction actions.

Communication Protocols

Metropolitan's WSCP Communication Plan details Metropolitan's action-oriented strategy for education, outreach, and coordination during each WSCP standard shortage stage and in response to a catastrophic loss of supply. The WSCP Communications Plan provides messaging strategies that would be implemented at each level, leading up to more focused crisis communication strategies. It emphasizes the need for plans to be adaptable and that Metropolitan management and/or Board of Directors could also call for specific messaging strategies that address unique shortage scenarios.

Compliance and Enforcement

This WSCP reporting element is required for urban retail suppliers only.

Legal Authorities

Metropolitan is a wholesale water provider organized as a cooperative of 26 voluntary members. Metropolitan was formed pursuant to the Metropolitan Water District Act, Statutes 1969, chapter 209, as amended, codified at California Water Code, Appendix Section 109 (the "MWD Act"). Pursuant to the MWD Act, Metropolitan has the express and implied statutory authority to "[p]rovide, sell, and deliver water at wholesale for municipal and domestic uses and purposes," among other powers. (MWD Act, §§ 120, 130.) To accomplish the provision of water, Metropolitan is also expressly authorized to promote and implement conservation programs, including during times of water shortage. (MWD Act, § 130.5.)

Metropolitan also has authority under the California Water Code to implement supply shortage programs. (Cal. Water Code, §§ 350-359, 375-378.) For example, Section 375(a) of the Water Code provides:

> *Notwithstanding any other provision of the law, any public entity which supplies water at retail or wholesale for the benefit of persons within the service area or area of jurisdiction of the public entity may, by ordinance or resolution adopted by a majority of the members of the governing body after holding a public hearing upon notice and making appropriate findings of necessity for the adoption of a water conservation program, adopt and enforce a water conservation program to reduce the quantity of water used by those persons for the purpose of conserving the water supplies of the public entity.*

Cal. Water Code, § 375(a). Water Code Section 375(b) also provides the authority for pricing to encourage water conservation.

Metropolitan's Board of Directors has approved many policies and rules, codified in Metropolitan's own Administrative Code, which further provide Metropolitan the authority to ensure the availability of its water during times of shortages. For example, Administrative Code Section 3107 requires that any territory annexed to Metropolitan comply with Metropolitan's water use efficiency guidelines.

The Board has also ratified various policies and rules to implement a Water Supply Allocation Plan (WSAP) to address shortage conditions. Metropolitan's WSAP provides a standardized methodology for allocating supplies during times of shortage. The WSAP is authorized pursuant to the following Board actions:

- By Minute Item 43514, dated April 13, 1999, the Board adopted the Water Surplus and Drought Management Plan.
- By Minute Item 44005, dated June 17, 2000, the General Manager has the authority to reduce Interim Agriculture Water Program deliveries up to 30 percent prior to imposing any mandatory allocation under the Water Surplus and Drought Management Plan.
- By Minute Item 47393, dated February 12, 2008, the Board adopted the Water Supply Allocation Plan.
- By Minute Item 48376, dated August 17, 2010, the Board approved adjustments to the Water Supply Allocation Plan.
- By Minute Item 48803, dated September 12, 2011, the Board approved adjustments to the Water Supply Allocation Plan.
- By Minute Item 74526, dated February 11, 2014, the Board adopted the Water Supply Alert Resolution.
- By Minute Item 49979, dated December 9, 2014, the Board approved adjustments to the Water Supply Allocation Plan.

In addition to the statutes and other legal authorities set forth above, Metropolitan is empowered to implement and enforce its shortage response actions pursuant to various resolutions. For example, on April 11, 2016, Metropolitan's Board voted to adopt Metropolitan's 2015 UWMP and authorized its submittal to the State of California as stated

in Resolution 9209. Metropolitan's 2015 UWMP contains Metropolitan's December 2014 Water Supply Allocation Plan in Appendix 4. Metropolitan's 2015 UWMP also describes in Chapter 2.4 Metropolitan's WSAP and Water Surplus and Drought Management (WSDM) Plan, which guide Metropolitan's planning and operations during both shortage and surplus conditions. On May 11, 2021, Metropolitan's Board voted to adopt Metropolitan's 2020 UWMP and WSCP as stated in Resolutions 9279 and 9281, respectively. On May XX, 2026, Metropolitan's Board voted to adopt Metropolitan's 2025 UWMP and WSCP as stated in Resolutions XXXX and XXXX, respectively. These two Resolutions authorize Metropolitan to implement and enforce its shortage response actions contained in the WSCP, which is attached as Appendix 4 to the UWMP.

Additionally, numerous agreements allow Metropolitan to take its shortage response actions. Supply augmentation actions are authorized by the agreements shown in Appendix 3 of the 2025 UWMP: Justifications for Supply Projections.

If necessary, Metropolitan shall declare a water shortage emergency in accordance with CWC Chapter 3 (commencing with Section 350) of Division 1. In addition, Metropolitan shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Government Code Section 8558.

Financial Consequences of WSCP

A water shortage may be created by either a reduction in water supply, or an increase in water demand, or a combination of both. Metropolitan's shortage response actions include supply augmentation, demand management, and operational flexibility, all of which could impact Metropolitan financially. From these financial effects, there is a potential for expenditures exceeding revenues more than budgeted, thereby requiring unanticipated draws from reserves.

Variation in the amount of revenues is already part of Metropolitan's financial planning. Revenues vary according to regional weather and the availability of statewide water supplies. In dry years, local demands increase, and Metropolitan may receive higher than anticipated revenues due to increased sales volumes. In contrast, in wet years, demands decrease, and revenues drop due to lower sales volumes. In addition, statewide supply shortages such as those in 2009, 2015, and 2022 also affect Metropolitan's revenues. Such revenue surpluses and shortages could cause instability in water rates. To mitigate this risk, Metropolitan implements various financial strategies including maintaining financial reserves, with a minimum and target balance, to stabilize water rates during times of reduced water sales. The reserves hold revenues collected during times of high water sales and are used to offset the need for revenues during times of low sales. Metropolitan's practice of using reserves to buffer unexpected increases or decreases in budgeted revenue also applies to unexpected expenditure increases or decreases resulting from shortage responses.

Metropolitan uses its financial reserves to mitigate the impacts of water shortages. This policy applies to each of the six shortage levels described in the WSCP. Financial reserves create a buffer to reduce the financial impact of the water shortage. Other mitigation actions such as reducing O&M expenses, deferring Capital Improvement Projects, and

rates/charges increases are part of Metropolitan's biennial budget and rate design cycle, and are not used routinely to mitigate financial impacts of water shortage response actions.

Metropolitan's reserve policy establishes minimum and target balances for unrestricted reserves at June 30 of each year. Under the refinements adopted by the Board in July 2025, the minimum and target reserve levels are now linked to the exceedance level used for water-demand forecasting and exclude variable costs and uncertain or one-time revenues. Treatment-related revenue requirements are now incorporated into these reserve calculations through consolidation of the Treatment Surcharge Stabilization Fund into Unrestricted Reserves.

Reserves are one-time resources and are not to be used to support ongoing operational expenditures. Funds above the target reserve level may only be used at the direction of the Board and are limited to capital spending in lieu of debt issuance, redemption or defeasance of outstanding debt, funding pension and Other Post-Employment Benefit liabilities, or other legal or financial obligations as determined by the Board.

Consistent with the Administrative Code, the fixed-charge coverage ratio requirement remains unchanged. When the fixed-charge coverage ratio is at or above 1.2 and reserve levels meet or exceed minimum policy requirements, reserves remain available to support Metropolitan's shortage response actions and associated financial consequences. The updated policy framework, including exceedance-based reserve sizing and Board oversight of reserve uses, reinforces long-term financial resilience and rate stability while preserving access to reserves during shortage conditions.

Monitoring and Reporting

This WSCP reporting element is required for urban retail suppliers only.

WSCP Reevaluation and Improvement

The WSCP will be periodically re-evaluated to ensure that its shortage response actions are effective and up to date based on lessons learned from implementing the WSCP. The WSCP may be revised and updated during the UWMP update cycle to incorporate updated and new information. For example, new supply augmentation actions may be added, and actions that are no longer applicable for reasons such as program expiration may be removed. However, if significant revisions are warranted before the UWMP is updated, the WSCP will be updated outside of the UWMP update cycle. In the course of preparing the Annual Assessment each year, Metropolitan staff will routinely consider the functionality of the overall WSCP and will prepare recommendations for Metropolitan's Board of Directors if changes are found to be needed.

The WSCP was readopted on May 12, 2026.

Relationship with Other Metropolitan Shortage Planning

The WSCP is designed to be consistent with the Water Surplus and Drought Management (WSDM) Plan, Water Supply Allocation Plan (WSAP), and other emergency planning efforts as described below. WSDM Plan principles guide the specific actions to be taken under WSCP shortage stages. Data collection, continual analysis, and monthly reporting processes of WSDM Plan implementation is the basis for Metropolitan's Annual Water Supply and Demand Assessment that is provided annually to the state. The WSAP is

integral to the WSCP's shortage response strategy in the event that Metropolitan determines that supply augmentation (including storage) and voluntary demand reduction measures would not be sufficient to meet a projected shortage.

Water Surplus and Drought Management Plan

Metropolitan's Board adopted the WSDM Plan in April 1999, which provides policy guidance for 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 reduce the possibility of extreme shortages and shortage allocations. Unlike Metropolitan's previous shortage management plans, the WSDM Plan recognizes the link between surpluses and shortages, and it integrates a flexible sequence of planned operational actions with respect to both conditions.

WSDM Plan Development

Metropolitan and its member agencies jointly developed the WSDM Plan during 1998 and 1999. This planning effort included more than a dozen half-day and full-day workshops and more than three dozen meetings between Metropolitan and member agency staff. The result of the planning effort is a consensus plan that addresses a broad range of regional water management actions and strategies.

WSDM Plan Principles and Goals

The guiding principle of the WSDM Plan is to manage Metropolitan's water resources and management programs to maximize management of wet year supplies and minimize adverse impacts of water shortages to retail customers. From this guiding principle came the following supporting principles:

- Encourage efficient water use and economical local resource programs
- Coordinate operations with member agencies to make available as much surplus water as possible for use in dry years
- Pursue innovative transfer and banking programs to secure more imported water for use in dry years
- Increase public awareness about water supply issues

The WSDM Plan also declared that if mandatory imported water allocations become necessary, they would be calculated on the basis of need, as opposed to any type of historical purchases. The WSDM Plan contains the following considerations that would go into an allocation of imported water:

- Impact on retail consumers and regional economy
- Investments in local resources, including recycling and conservation
- Population growth
- Changes and/or losses in local supplies
- Participation in Metropolitan's non-firm (interruptible) programs

- Investment in Metropolitan's facilities

WSDM Plan Implementation

Each year, Metropolitan evaluates the level of supplies available and existing levels of water in storage to determine the appropriate management stage. Each stage is associated with specific resource management actions designed to: (1) avoid an Extreme Shortage to the maximum extent possible; and (2) minimize adverse impacts to retail customers if an Extreme Shortage occurs. The current sequencing outlined in the WSDM Plan reflects anticipated responses based on detailed modeling of Metropolitan's existing and expected resource mix.

Surplus Stages

Metropolitan's supply situation is considered to be in surplus as long as net annual deliveries can be made to water storage programs. The WSDM Plan further defines four surplus management stages that guide the storage of surplus supplies in Metropolitan's storage portfolio. Deliveries for storage in DVL and in SWP terminal reservoirs continue through each surplus stage provided there is available storage capacity. Withdrawals from DVL for regulatory purposes or to meet seasonal demands may occur in any stage. Deliveries to other storage facilities may be interrupted, depending on the amount of the surplus.

Shortage Stages

The WSDM Plan distinguishes between Shortages, Severe Shortages, and Extreme Shortages. Within the WSDM Plan, these terms have specific meanings relating to Metropolitan's ability to deliver water to its member agency customers.

Shortage: Metropolitan can meet full-service demands and partially meet or fully meet interruptible demands, using stored water or water transfers as necessary.

Severe Shortage: Metropolitan can meet full-service demands only by using stored water, transfers, and possibly calling for extraordinary conservation.

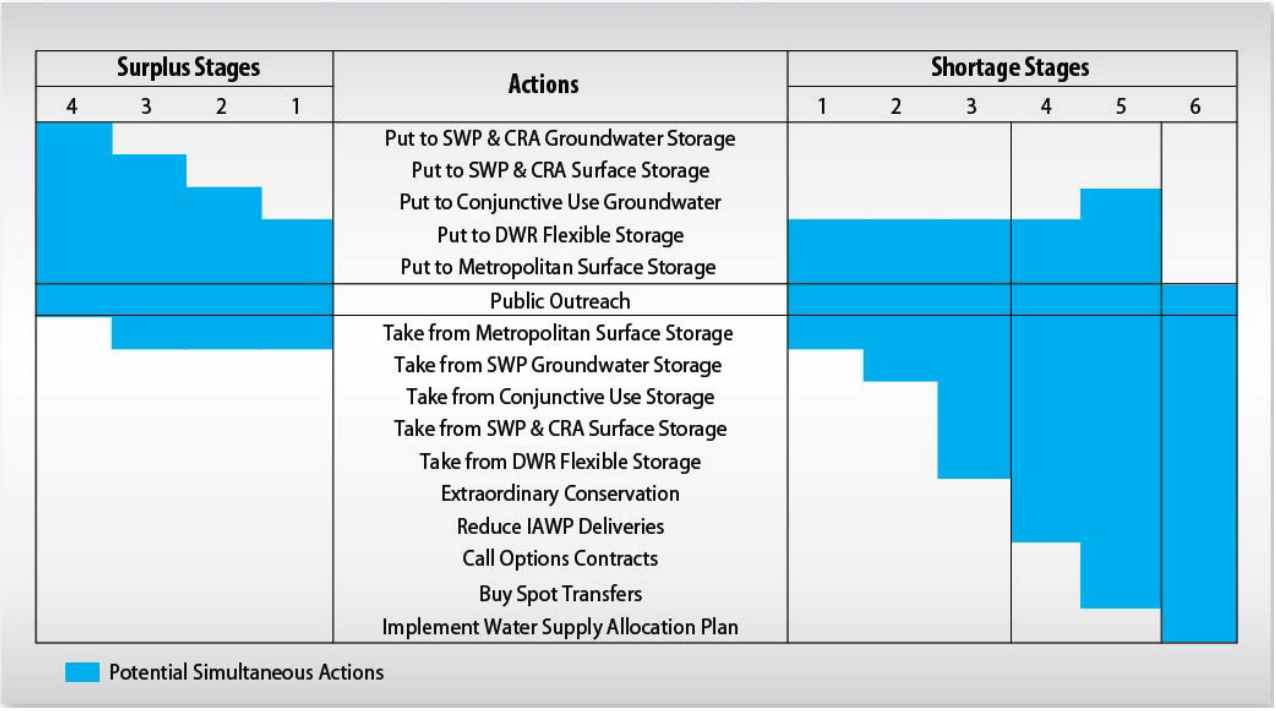
Extreme Shortage: Metropolitan allocates available supply to full-service customers.

The WSDM Plan also defines six shortage management stages to guide resource management activities. These stages are not defined merely by shortfalls in imported water supply, but also by the water balances in Metropolitan's storage programs. Thus, a ten percent shortfall in imported supplies could be a stage one shortage if storage levels are high. If storage levels are already depleted, the same shortfall in imported supplies could potentially be defined as a more severe shortage.

When Metropolitan must make net withdrawals from storage to meet demands, it is considered to be in a shortage condition. Under most of these stages, Metropolitan is still able to meet all end-use demands for water. For shortage stages 1 through 3, Metropolitan will meet demands by withdrawing water from storage. At shortage stages 4 and 5, Metropolitan may undertake additional shortage management steps, including issuing public calls for extraordinary conservation and exercising water transfer options, or purchasing water on the open market.

Figure 2-1 shows the actions under surplus and shortage stages and when an allocation plan would be necessary to enforce mandatory cutbacks. The overriding goal of the WSDM Plan is to avoid reaching Shortage Stage 6, an Extreme Shortage.

Figure 2-1
Resource Stages, Anticipated Actions, and Supply Declarations from the WSDM Plan



Water Supply Allocation Plan

The WSAP provides a formula for equitably allocating available water supplies to the member agencies in case of extreme water shortages within Metropolitan's service area. The WSAP was approved by Metropolitan's Board in February 2008 and has since been implemented three times, most recently in April 2015. The WSAP was developed in consideration of the principles and guidelines described in the WSDM Plan, with the objective of creating an equitable needs-based allocation. The WSAP formula seeks to balance the impacts of a shortage at the retail level for shortages of Metropolitan supplies of up to 50 percent. The formula takes into account growth, local investments, changes in supply conditions, and the demand hardening aspects of non-potable recycled water use and the implementation of conservation savings programs. In rare cases where system supplies are unable to meet location-specific demands, such as in 2022-2023, when there was insufficient SWP system water to meet SWP-dependent demands, a region-wide allocation through the WSAP may not be appropriate. In such cases, Metropolitan may consider other measures, such as the Emergency Water Conservation Program (EWCP), described below, to address the specific problem.

Water Supply Allocation Plan Development

Between July 2007 and February 2008, Metropolitan staff worked jointly with Metropolitan's member agencies to develop the WSAP. Throughout the development process, Metropolitan's Board was provided with regular progress reports on the status of the WSAP. The WSAP was adopted at the February 12, 2008, Board meeting. Since the WSAP's adoption in 2008, Metropolitan has worked extensively with the member agencies to periodically review the WSAP formula. Following Board-directed formal review of the WSAP at 12 months after initial implementation and at three years after initial adoption, the Board approved adjustments to the WSAP formula on August 17, 2010, and September 13, 2011. In light of drought conditions, Metropolitan staff convened a member agency working group between July and November 2014 to revisit the WSAP before possible implementation in 2015. On December 9, 2014, the Board approved additional adjustments to the formula.

The WSAP Formula

The WSAP formula is calculated in three steps: base period calculations, allocation year calculations, and supply allocation calculations. The first two steps involve standard computations, while the third step contains specific methodology developed for the WSAP.

Step 1: Base Period Calculations

The first step in calculating a water supply allocation is to estimate water supply and demand using a historical base period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from fiscal years (July through June) ending 2013 and 2014.

Step 2: Allocation Year Calculations

The next step in calculating the water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population growth and changes in local supplies.

Step 3: Supply Allocation Calculations

The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. There are a number of adjustments that go into a member agency's water supply allocation. Each element and its application in the allocation formula are discussed in detail in Metropolitan's WSAP.

Annual Reporting Schedule on Supply/Demand Conditions

Managing Metropolitan's water supply resources to minimize the risk of shortages requires timely and accurate information on changing supply and demand conditions throughout the year. To facilitate effective resource management decisions, the WSDM Plan includes a monthly schedule for providing supply/demand information to Metropolitan's senior management and Board, and for making resource allocation decisions. Table 2-8 shows this schedule.

Table 2-8
Schedule of Reporting and Water Supply Allocation Decision-Making

Month	Information Report/Management Decision
January	Initial supply/demand forecasts for the year
February - March	Update supply/demand forecasts for the year
April - May	Finalize supply/demand forecasts Management decisions re: Contractual Groundwater and Option Transfer Programs Board decision re: Need for Extraordinary Conservation
October - December	Report on Supply and Carryover Storage

Emergency Water Conservation Program

In April 2022, Metropolitan's Board declared a Water Shortage Emergency Condition for Metropolitan's SWP-dependent area and adopted a framework for a new program called the Emergency Water Conservation Program (EWCP). The EWCP preserved supplies by reducing non-essential uses of water delivered to the SWP-dependent area. Six member agencies were affected by the EWCP in 2022, serving approximately six million people. The EWCP began implementation on June 1, 2022, and was authorized through June 30, 2023. The EWCP allowed two paths for compliance involving either enforced restrictions on outdoor watering or adherence to the volumetric limits subject to monetary penalties per acre-feet for using SWP water over the limits. The first compliance path required member agencies to restrict outdoor irrigation to one day per week beginning June 1, 2022. The second path gave member agencies discretion to comply with monthly volumetric limits directly and to tailor their water management responses appropriately to their local circumstances. Due to improved water supply conditions in 2023, the EWCP was rescinded in March 2023.

Catastrophic and Emergency Planning

As part of the WSCP, the CWC requires urban suppliers to plan for catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other potential emergency events. In addition, CWC Section 10632.5 further requires urban water suppliers to develop a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. For Metropolitan, these required planning elements are captured in the analyses that went into developing its Emergency Storage Objective, Seismic Resiliency Reports, and Emergency Response Plans. Elements of these Metropolitan analyses are summarized below.

Emergency Storage Objective

Metropolitan established its original criteria for determining emergency storage requirements in the October 1991 Final Environmental Impact Report for the Eastside Reservoir, which is now named Diamond Valley Lake. These criteria were again discussed in the 1996 IRP. Metropolitan's Board approved both of these documents. Emergency

storage requirements are based on the potential of a major earthquake that would damage all supply aqueducts isolating Southern California from its imported water sources.

In 2019, Metropolitan and its member agencies completed a collaborative process to update the regional planning estimate of Metropolitan's Emergency Storage Objective. This emergency storage represents the amount of water that Metropolitan would store for the region in preparation for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California, including: the Colorado River Aqueduct, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct.

The emergency storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service. The Emergency Storage Objective considers a six- and twelve -month outage period for the imported supply aqueducts incorporating latest seismic information and operational flexibility of Metropolitan's system, a retail water demand cutback ranging from 25 to 35 percent considering the level of conservation that the region achieved during the recent drought, and an aggregated loss of 10 to 20 percent of local supplies accounting for factors that could affect local production during emergency conditions.

Under this update, Metropolitan's Emergency Storage Objective was set to 750 TAF, as this level of storage would prevent severe water shortages to the region given new information on expected recovery durations. The emergency storage volume represents a planning estimate for the amount of water that Metropolitan would store for the region in preparation for a catastrophic earthquake or other disaster. It is not intended to set a basis or a policy for allocating or apportioning storage for any individual member agency. The detailed description of Metropolitan's Emergency Storage Objective is included in Appendix 7.

Emergency Freshwater Pathway (Sacramento-San Joaquin Delta)

It has been estimated by the California Department of Water Resources (DWR) that in the event of a major earthquake in or near the Delta, water supplies could be interrupted for up to three years, posing a significant and unacceptable risk to the California business economy. A post-event strategy would provide necessary water supply protections to avert this catastrophe. Such a plan has been coordinated through DWR, U.S. Army Corps of Engineers (Army Corps), Bureau of Reclamation, California Office of Emergency Services (Cal OES), Metropolitan, and the State Water Contractors.

DWR Delta Flood Emergency Management Plan

The Delta Flood Emergency Management Plan (DWR, 2018) provides strategies for response to Delta levee failures, up to and including earthquake-induced multiple island failures during dry conditions when the volume of flooded islands and saltwater intrusion are large, resulting in curtailment of export operations. Under these severe conditions, the plan includes a strategy to establish an emergency freshwater pathway from the central Delta along the Middle River and Victoria Canal to the export pumps in the south Delta. The plan includes the prepositioning of emergency construction materials at existing and new stockpile and warehouse sites in the Delta, and development of tactical modeling tools

(DWR Emergency Response Tool) to predict levee repair logistics, timelines of levee repair and suitable water quality to restore exports. The Delta Flood Emergency Management Plan has been extensively coordinated with state, federal, and local emergency response agencies. DWR, in conjunction with local agencies, the Army Corps and Cal OES, conduct tabletop and field exercises to test and revise the plan under real-time conditions

DWR and the Army Corps provide vital Delta region response to flood and earthquake emergencies, complementary to Cal OES operations. These agencies perform under a unified command structure and response and recovery framework. The Northern California Catastrophic Flood Response Plan (Cal OES, 2018) incorporates the DWR Delta Flood Emergency Management Plan. The Delta Emergency Operations Integration Plan (DWR and Army Corps, 2019) integrates personnel and resources during emergency operations.

Pathway Implementation Timeline

The Delta Flood Emergency Management Plan has found that by using pre-positioned stockpiles of rock, sheet pile and other materials, multiple earthquake-generated levee breaches and levee slumping along the freshwater pathway can be repaired in less than six months. A supplemental report (Levee Repair, Channel Barrier and Transfer Facility Concept Analyses to Support Emergency Preparedness Planning, M&N, August 2007) evaluated among other options, the placement of sheet pile to close levee breaches, as a redundant method if availability of rock is limited by possible competing uses. The stockpiling of sheet pile is vital should more extreme emergencies warrant parallel and multiple repair techniques for deep levee breaches. Stockpiles of sheet pile and rock to repair deep breaches and an array of levee slumping restoration materials are stored at DWR and Army Corps stockpile sites and warehouses in the Delta.

Emergency Stockpile Sites and Materials

DWR has acquired lands at Rio Vista and Stockton as major emergency stockpile sites, which are located and designed for rapid response to levee emergencies. The sites provide large loading facilities, open storage areas and new and existing warehousing for emergency flood-fighting materials, which augment existing warehousing facilities throughout the Delta. These sites in Rio Vista and Stockton have significant stockpiles of flood response materials, including riprap and sheet piles. The Army Corps maintains large warehousing facilities in the Delta to store materials for levee freeboard restoration, which can be augmented upon request of other stockpiles in the United States. Pre-positioned rock and sheet pile are used for closure of deep levee breaches. Warehoused materials for rapid restoration of slumped levees include muscle (k-rail) walls, super sacks, caged rock containers, sandbags, stakes, and plastic tarp. Stockpiles will be augmented as materials are used.

Emergency Response Drills

Earthquake-initiated multiple island failures will mobilize DWR and Army Corps resources to perform Delta region flood fight activities within an overall Cal OES framework. In these events, DWR and the Army Corps integrate personnel and resources to execute flood fight plans through the Delta Emergency Operations Integration Plan (DWR and Army Corps, 2019). DWR, the Army Corps and local agencies perform emergency exercises focusing on communication readiness and the testing of mobile apps for information collection and

dissemination. The exercises train personnel and test the readiness of emergency preparedness and response capabilities under unified command, and provide information to help to revise and improve plans.

Levee Improvements and Prioritization

The DWR Delta Levees Subventions and Special Projects Programs have prioritized, funded, and implemented levee improvements along the emergency freshwater pathway and other water supply corridors in the central and south Delta. These efforts are complementary to the Delta Flood Emergency Management Plan, which along with pre-positioned emergency flood-fighting materials, ensures reasonable seismic performance of levees and timely pathway restoration after a seismic event. These programs have been successful in implementing a coordinated strategy of emergency preparedness to the benefit of SWP and CVP export systems.

Urban agencies, including Metropolitan, Contra Costa Water District, East Bay Municipal Utility District, and others, have participated in levee improvement projects along or near the Old and Middle River corridors. Overall, as indicated above, there are robust plans and measures in place to respond to earthquake and flood-induced levee failures.

SWP Seismic Resiliency

DWR's SWP seismic resiliency efforts are managed within the SWP Dam Safety Program. The Dam Safety Program was established in 2018. Sixteen Dam Safety Program initiatives were established with input from external industry experts and recommendations from the 2017 Oroville Spillway incident reports. The initiatives aimed to set internal roles, responsibilities, and expectations for implementing standardized procedures for inspections, including inspection frequency, documentation, and reporting. A key component of the SWP Dam Safety Program is the use of Potential Failure Mode Analysis, including seismic risks, to prioritize projects based on risk, which aligns with dam safety industry best practices and Federal Energy Regulatory Commission guidelines. In 2023, DWR completed its first Dam Safety Program audit, which is to be performed every five years. The audit determined that DWR's program is on par with its peers, and DWR is a leader in some areas.

DWR is conducting Seismic Walkdowns of all SWP plants. A Seismic Walkdown consists of visual assessment of vulnerable components and review of design drawings and documents. The first Seismic Walkdown was performed at Hyatt Powerplant in Oroville, as recommended by the Dam Safety Director's Safety Review Board. Of the 30 items identified for further analysis, only two will require an anchorage retrofit/redesign at Hyatt Powerplant. Seismic Walkdowns have also been completed at Devil Canyon Power Plant and Pearblossom Pumping Plant.

The most prominent seismic project DWR is implementing is the joint USBR/DWR Sisk Dam Safety of Dam Project corrective action, which will result in major seismic stability improvements. Construction of the Sisk Dam modifications began in 2022 and is expected to be completed in 2032. Other prominent SWP Dam Safety Projects being implemented are Oroville Dam Coreblock and Grout Gallery Piezometers, Parish Camp Saddle Dam Raise, Del Valle Dam Conservation Outlet Works Seismic Stability Investigation, and Castaic Dam Low-level Gate Dogging and New Outlet Works Planning Study.

DWR has also developed several plans and instructions related to post-earthquake response that contain instructions for initial observation, validation inspections, and technical assessments. DWR operates and relies on 112 seismic stations across the SWP for its seismic warning system. Additionally, DWR partnered with the California Office of Emergency Services (Cal OES) and the operators of the California Integrated Seismic Network (USGS, Berkeley Seismological Laboratory, Caltech) to update its seismic warning system. Since 2021, DWR has replaced 51 seismic stations and obsolete communication modems and plans to replace the remaining stations by 2029. The SWP also has 13 seismic switches to prevent loss of water and reduce impacts downstream of the switch if triggered by ground acceleration greater than 0.1g, the commonly used pseudostatic acceleration factor for seismic design of SWP plants. Overall, DWR is engaged in extensive seismic resiliency efforts to protect the SWP.

In March of 2025, DWR hosted a Seismic Resilience Water Supply Task Force Seminar and Workshop. Metropolitan and LADWP, among others, were present at the Workshop. Key topics of discussion included: sharing concepts of resource sharing during a major emergency, reviewing the Southern California Catastrophic Earthquake Plan with Cal OES, and discussing updates of the Joint Agency Emergency Response Plan. The Joint Agency Emergency Response Plan is in the process of being updated in 2026. In Spring 2026, a joint agency tabletop exercise related to seismic event response and SWP reliability will be coordinated by DWR.

Electrical Outages

Metropolitan has also developed contingency plans that enable it to deal with both planned and unplanned electrical outages. These plans include the following key points:

- In event of power outages, water supply can be maintained by gravity feed from regional reservoirs such as DVL, Lake Mathews, Castaic Lake, and Silverwood Lake.
- Maintaining water treatment operations is a key concern. As a result, all Metropolitan treatment plants have at least two emergency generators capable of operating the treatment plant in the event of supply failure on the main electrical grid. These generators will automatically operate when power from the grid is interrupted, and annual testing is conducted to ensure they are operational and reliable. In addition, within the water treatment plants, there are also dual electrical systems for all critical facilities (e.g., chemical feed systems) to provide redundancy and resiliency.
- Valves at Lake Skinner can be operated by the backup generation at the Lake Skinner treatment plant.
- Metropolitan owns mobile generators that can be transported quickly to key locations, such as reservoir intake/outtake structures, if necessary.
- The CRA electric transmission system can supply power to the five CRA pumping plants from three independent power sources: Mead 230 kilovolt (kV) substation located near Hoover Dam; Parker Dam 230 kV substation near Gene; and from interconnections with Southern California Edison. These multiple locations where Metropolitan's 230 kV transmission system interconnects to the regional transmission grid provide a redundant path to bring 230 kV power to Hinds, Eagle Mountain, Iron Mountain, and Gene Pumping Plants. In addition to redundant paths of power to each

CRA pumping plant, the CRA electric transmission system has dual lines from the 230 kV Mead substation and multiple disconnect switches and circuit breakers. This improves the flexibility of the CRA electric transmission system to isolate portions of the system for maintenance or repairs and re-route power from the three independent power sources to the pumping plants while repairs are underway.

Seismic Risk Assessment and Mitigation Plan

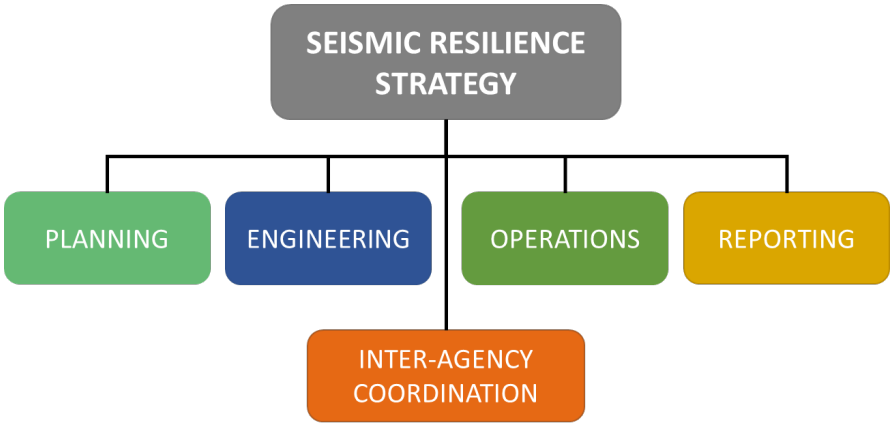
CWC Section 10632.5 mandates UWMPs to include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. For Metropolitan, the required assessment and plan are accomplished as part of developing its resilience strategy and are presented in detail in its seismic resiliency reports. This section provides a summary of the various components of Metropolitan's resilience strategy. These components are described in detail in Metropolitan's Seismic Resilience Report First Biennial Report (February 2018) and subsequent updates in 2020 and 2025. The 2025 Seismic Resilience Report is presented as part of Appendix 8.

Over its nearly 100-year history, Metropolitan has been proactive in mitigating seismic risks posed to its expansive infrastructure, as well as improving its ability to maintain (or quickly restore) water deliveries following a major earthquake. This ability to mitigate seismic risks and maintain (or quickly restore) water deliveries following a seismic event is referred to as seismic resilience. Metropolitan's holistic strategy for seismic resilience follows a defense-in-depth, multi-layered approach for managing risk. Metropolitan's Seismic Resilience Strategy has three primary objectives:

1. Provide a diversified water supply portfolio, system flexibility, and emergency storage.
2. Prevent damage to water delivery infrastructure in probable seismic events and limit damage in extreme events.
3. Minimize water delivery interruptions through a dedicated emergency response and recovery organization.

Metropolitan's Seismic Resilience Strategy is implemented through four components that encompass the various internal functions that promote Metropolitan's seismic resilience objectives. These components are supplemented by Metropolitan's commitment to inter-agency coordination when preparing and responding to a seismic event and other emergencies. The strategy is shown below in Figure 2-2.

Figure 2-2
Seismic Resiliency Strategy



A brief description of the components of Metropolitan's Seismic Resilience Strategy and examples of their implementation are provided below.

Planning

The goals of the planning component are to develop and maintain a diversified water resource portfolio; provide a flexible system that allows for operational changes to handle variations in water supply, planned or unplanned system outages; and to maintain adequate emergency storage supplies. Metropolitan has developed a diverse water resource portfolio through the enactment of various exchange and water banking programs. These water supply programs are described in detail in Chapter 3 and Appendix 3. In addition to existing supply programs, development of the potential Regional Recycled Water Program (which is now called Pure Water Southern California) would provide Metropolitan with an additional water resource and would be strategically located on the coastal side of the San Andreas Fault. Metropolitan also strives for regional seismic resilience by incentivizing local agencies to develop increased conservation, recycling, storage, and other water management programs.

As Metropolitan expanded its system over the years, it has continually improved the flexibility of the system to handle changes in water supply or pipeline or facility outages. One example of Metropolitan's system flexibility is the Common Pool service area, which can be supplied by the Jensen, Weymouth, or Diemer water treatment plants. Additionally, Metropolitan has constructed its system such that most of the service area can be supplied by either Colorado River or State Water Project supplies.

Metropolitan's imported water supplies from the CRA and SWP East and West Branches cross the San Andreas Fault (SAF) Zone prior to reaching Metropolitan's service area. A major earthquake on the SAF has the potential of damaging all three aqueducts and disrupting imported supplies for up to six months. Metropolitan constructed Diamond Valley Lake (DVL) on the coastal side of the fault to mitigate the potential impacts of a major SAF earthquake to its service area. Completion of DVL nearly doubled Metropolitan's available surface water storage in the region and, along with other local reservoirs, is used to

maintain six to twelve months of emergency water storage supply. Water from DVL can supply four of Metropolitan's five regional water treatment plants.

More recently, Metropolitan has implemented several projects to improve delivery flexibility in response to drought. These projects also improve the seismic resilience of the system. For example, the Lakeview Pipeline/Inland Feeder Intertie allows delivery of water from DVL to the Mills Water Treatment Plant, normally supplied by the SWP East Branch, which is vulnerable to damage from a San Andreas Fault earthquake. Other projects currently being implemented include the DVL Storage to Rialto Pipeline project and the Sepulveda Feeder Pumping Project Stage 1. Both projects will enable delivery of Colorado River water or stored DVL water to areas highly dependent on SWP supplies in case of damage to the SWP East or West Branches.

Engineering

The goal of the engineering component is to assess and mitigate seismic risk to individual facilities and the system. This is accomplished through Metropolitan's Seismic Resilience of Structures Program, the Seismic Resilience of Pipelines Program, the Dam Safety Program, and through special seismic assessments.

Seismic Resilience of Structures

Metropolitan's program to increase the seismic resilience of structures is an ongoing program with the goal of protecting life safety and critical infrastructure to minimize water delivery interruptions following a seismic event. The initial program focused on evaluating the seismic risk of above-ground structures (e.g., water treatment plants) constructed prior to 1990 and upgrading structures to mitigate the risk when found to be seismically deficient. The program has expanded to include post-1990 structures due to the progress made on the initial list of structures. Examples of recent seismically upgraded facilities include the Union Station Headquarters building, the Diemer Wash Water Reclamation Plant No. 2, the Lake Mathew Disaster Recovery Facility, and the Weymouth East and West Wash Water Tanks.

Seismic Resilience of Pipelines

Metropolitan's conveyance and distribution system has been built in conformance with standards and practices at the time of design. In keeping with the goals of the Seismic Resilience Strategy, Metropolitan is developing seismic design criteria for new pipelines based on the current state of practice, geotechnical and seismicity criteria, operating conditions, and asset management strategies. The planned design approach for new pipelines will be to establish performance criteria, identify seismicity and ground conditions along the alignment, and design the pipeline to resist damage from ground shaking and deformation. Specialized pipe joints and sections can be designed to accommodate ground deformation from fault displacement or liquefaction. For existing pipelines, seismic resilience will be incorporated as a component of pipeline rehabilitation projects. Metropolitan will evaluate each upgrade individually to balance risk, performance, and cost.

Metropolitan's Casa Loma Siphon Barrel No. 1 Seismic Upgrade Project is an example of Metropolitan incorporating seismic design in the rehabilitation of existing pipelines. The existing siphon, which crosses a segment of the San Jacinto Fault Zone and is subject to long-term subsidence, have been replaced with earthquake-resistant ductile iron pipe. The

pipe joints are designed to accommodate ground displacement without failure to allow for continued service following an earthquake.

Metropolitan's Prestressed Concrete Cylinder Pipe (PCCP) Rehabilitation Program is a long-term effort to line Metropolitan's PCCP portions of its conveyance system with a welded steel liner to address the aging pipes. The welded steel liner will also improve a pipeline's performance against seismic hazards. Additionally, for pipeline segments subject to fault rupture, Metropolitan is evaluating possible improvements to the design to mitigate the impacts of a fault rupture. Possible improvements include improved joint construction and modifications to the grout material between the liner and the PCCP to achieve higher seismic performance.

Dam Safety Program

Metropolitan has an ongoing Dam Safety Initiatives Program that has initiated several plans to improve Metropolitan's dam seismic safety and earthquake readiness. These initiatives are being coordinated with the California Division of Safety of Dams (DSOD) and Office of Emergency Services and include the following:

- Ongoing preparation of Emergency Action Plans, including inundation maps
- Performing potential failure modes analysis and dam safety risk assessments for Metropolitan's dams and identifying risk reduction measures
- Performing training exercises at the dam site to test processes during a seismic event
- Providing training and guidance on overall dam safety
- Reviewing operation and maintenance methods for reservoir drawdown and operations after a seismic event
- Updating guidelines and procedures on protection against seismic risk
- Establishing a strong communications system on seismic information
- Performing structural strengthening of dams, including rehabilitation and improvement of spillways and inlet/outlet towers, such as the Lake Skinner Outlet Tower
- Modernizing dam safety instrumentation systems for enhanced monitoring and reporting capabilities

Special Seismic Assessments

Metropolitan conducts special seismic assessments to increase understanding of the vulnerability of Metropolitan's assets and operations to various seismic hazards. The studies focus on hazards specific to individual facilities or the system as a whole and identify options to mitigate the risks posed by the hazards. In addition, the studies support emergency response training and planning for future earthquake events by estimating the magnitude of damage that may occur from various seismic events. The following is a list of some of the reports that Metropolitan has completed.

- Liquefaction Susceptibility Mapping for the Metropolitan Water District of Southern California's Feeder System (Report No. 1625), Carollo Engineers, Inc., 2019.

- Colorado River Aqueduct – San Gorgonio Pass Seismic Event Vulnerability Study (Report No. 1484), GeoPentech, July 2014.
- Potential Effects of Southern California Seismic Events on Metropolitan Water Deliveries (Report No. 1335), Metropolitan Facility Planning staff, January 2009.

Metropolitan is currently reassessing its conveyance and distribution system against seismic hazards. The study is being conducted in collaboration with the University of California, Berkeley Center for Smart Infrastructure. Unlike previous studies, which assessed Metropolitan's risk against specific earthquake events, the current effort will utilize a probabilistic approach to evaluate the potential impacts to Metropolitan's system considering earthquakes with varying ranges of magnitude and rupture length at different faults in the region. This approach will provide a more comprehensive understanding of the relative risk, considering uncertainties in estimating hazard level and damage extent, for different pipelines. The findings will inform the prioritization process and result in a more effective mitigation effort.

Operations

The goal of the operations component is to maintain effective emergency planning and response capabilities. This is accomplished through maintaining an effective Emergency Response Organization, conducting routine emergency response training exercises and maintaining emergency construction capabilities.

Metropolitan's Emergency Response Organization (ERO) is comprised of over 200 predesignated employees who work in the Emergency Operations Center (EOC), the Incident Command Posts, or in the field during emergencies. ERO staff has completed specialized training that meets state and federal requirements. Metropolitan's emergency response structure follows the National Incident Management System (NIMS) and the State of California's Standardized Emergency Management System (SEMS).

In addition to specialized SEMS/NIMS training, Metropolitan staff routinely participate in emergency exercises that are often based on a simulated seismic event. In 2025, Metropolitan started a new five-year emergency exercise plan that will allow all member agencies to participate in at least one of Metropolitan's annual emergency exercises over the next five years.

Metropolitan also maintains Incident Command Posts (ICPs) at strategic locations throughout the district. These ICPs manage the response to local incidents when necessary. Each ICP is required to complete at least three exercises per year. In total, the EOC, ICPs and member agencies complete over 40 exercises each year.

Metropolitan maintains the necessary staffing, materials, and equipment to respond to two simultaneous pipeline breaks. The Machine Shop and Coating Shop at La Verne are available to fabricate pipe sizes up to 12 feet in diameter, and Metropolitan's construction forces have the necessary equipment and expertise to make the repairs in-house. In addition, Metropolitan has upgraded its satellite phones to ensure communication ability following a seismic event. Metropolitan has installed Starlink units at all 12 ICPs and EOC and has mobile units available for use during an emergency.

Reporting

Metropolitan has committed to providing annual updates to its Board of Directors on its seismic resilience strategy and its progress toward identified short-term and long-term goals. Metropolitan has also committed to providing a formal report on a five-year interval summarizing accomplishments related to seismic resilience and changes in directives to the Seismic Resilience Strategy.

Inter-Agency Coordination

Improving the region's seismic resilience requires that member agencies understand the seismic risks to the imported water supplies so that they may appropriately plan on the local level. Opportunities for inter-agency coordination are provided through the Local Resources Program, where Metropolitan incentivizes the development of local groundwater, recycling, and other supply resources to offset imported demands. As stated previously, Metropolitan provides member agencies the opportunity to participate in emergency response exercises. Metropolitan has developed maps that define the relative liquefaction susceptibility of the region, inclusive of the conveyance and distribution system and has made these maps available to member agencies. Metropolitan updated the emergency storage goals through several workshops in coordination with member agencies.

Metropolitan is also a member of the Seismic Resilience Water Supply Task Force, along with the California Department of Water Resources (DWR) and the Los Angeles Department of Water and Power (LADWP). As the owners of the three conveyance facilities that provide imported water to the region, Metropolitan, DWR, and LADWP recognize the importance of coordinating responses following a major seismic event that disrupts the imported water supplies. Each agency has provided an overview of the seismic risk to their respective systems and have agreed to use the existing California Water/Wastewater Agency Response Network (CalWARN) agreement to coordinate efforts following a major earthquake that disrupts service to the imported water supplies.

Emergency Response Plans

Metropolitan maintains an Emergency Response Plan (ERP) that meets the requirements of the American Water Infrastructure Act of 2018. This plan was certified with the Environment Protection Agency (EPA) in 2019, and it was certified again in September 2025. The ERP is updated periodically and provides guidance on how Metropolitan activates and operates its Emergency Operations Center (EOC), Incident Command Posts (ICPs) and Duty Officer program. Metropolitan's EOC follows the Standardized Emergency Management System (SEMS) model, and the ICPs use the Incident Command System (ICS) to manage local incident responses. The plan utilizes a multi-hazard approach and provides a strategy with various types of incidents. The plan also includes coordination with outside jurisdictions such as other utilities, cities, counties, state and federal governments.

2.6 Other Supply Reliability Risks

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. These challenges include the following:

Supplies

- The Colorado River Basin experienced a severe 5-year drought from 2000 to 2004, with both precipitation and runoff significantly below average. Since that time, precipitation has been, on average, near normal while runoff has been less than average in two out of every three years. Overall, a potential change in the precipitation to runoff relationship may be resulting in conditions in which less runoff is generated from a given level of precipitation, pushing the system toward a drying trend that is often characterized as a long-term drought.
- The current operational guidelines that govern operations on the Colorado River expire in 2026. Negotiations to determine operational guidelines to replace them remain ongoing, and the outcome is highly uncertain.
- California will likely be required to reduce its supplies from the Colorado River, on average, under the new guidelines. As the junior priority water user, Metropolitan is at risk of reduced supplies.
- Endangered species protection and conveyance needs in the Sacramento-San Joaquin River Delta System have resulted in operational constraints that are particularly important because pumping restrictions impact many water resources programs, including SWP supplies and additional voluntary transfers, Central Valley storage and transfers, and in-region groundwater and surface water storage programs. Regulatory requirements governing State Water Project operations, including recent Biological Opinions and Incidental Take Permits, are discussed in Chapter 3.2.
- Changing climate patterns are predicted to shift precipitation patterns and possibly affect water supply.
- Historical and ongoing subsidence in the San Joaquin Valley threatens the delivery capability of the SWP; significant investments are needed to restore reduced California Aqueduct capacity caused by subsidence.
- 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.
- Opposition to local seawater desalination projects from environmental groups and community organizations. New regulations and permitting uncertainty are also barriers to seawater desalination supplies.

Operations and Water Quality

- The cost and use of energy and greenhouse gas emissions.
- Water quality regulations and issues, such as algae toxins, PFAS, and the identification of constituents of emerging concern, have a significant impact on the region's water supply conditions and underscore the importance of flexible and adaptive regional planning strategies.
- Invasive mussel effects on maintenance and delivery operations.
- Salt and concentrate balance from a variety of sources.

Demand

- Fluctuations in population and economic growth.
- Uncertain location of growth.
- Uncertain housing stock and density.
- Changes in outdoor water use patterns.

Distribution System Water Losses

California Water Code Section 10631(d)(3) requires that urban retail suppliers quantify distribution system water loss for each of the five years preceding the plan update based on the water system balance methodology developed by the American Water Works Association (AWWA).

Wholesale suppliers like Metropolitan are not required to perform water loss audits and are not subject to the UWMP distribution system loss reporting required for retail suppliers under California Water Code Sections 10630(d)(1) or 10630(d)(3). Furthermore, AWWA's water system balance methodology was developed for retail suppliers, and it is thus not practicable for Metropolitan to voluntarily quantify distribution system water loss using that methodology.

Climate Change

Climate change adds its own uncertainties to the challenges of planning. Metropolitan's water supply planning has been fortunate in having 100 years of hydrological data regarding weather and water supply. This history of rainfall data has provided a sound foundation for forecasting both the frequency and the severity of future drought conditions, as well as the frequency and abundance of above-normal rainfall. But 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 causes of increasing concentrations of greenhouse gases. As a major steward of the region's water supply resources, Metropolitan is committed to performing its due diligence with respect to climate change.

Potential Impacts

While uncertainties remain regarding the exact timing, magnitude, and regional impacts of these temperature and precipitation changes, researchers have identified several areas of concern for California water planners. These include:

- Reduction in snowpack;
- Increased intensity and frequency of extreme weather events;
- Prolonged drought periods;
- Water quality issues associated with an increase in wildfires;
- Changes in runoff pattern and amount; and
- Rising sea levels resulting in
    - Impacts to coastal groundwater basins due to seawater intrusion;
    - Increased risk of damage from storms, high-tide events, and the erosion of levees; and
    - Potential pumping cutbacks on the SWP and Central Valley Project (CVP)

Other important issues of concern due to global climate change include:

- Effects on local supplies such as groundwater;
- Changes in urban and agricultural demand levels and patterns;
- Increased evapotranspiration from higher temperatures;
- Impacts to human health from water-borne pathogens and water quality degradation;
- Declines in ecosystem health and function;
- Alterations to power generation and pumping regimes; and
- Increases in ocean algal blooms affecting seawater desalination supplies.

Metropolitan's Activities Related to Climate Change Concerns

Resource Planning

Under the 2020 IRP Regional Needs Assessment, Metropolitan recognizes additional risks and uncertainties from a variety of sources:

- Water quality
- Climate change
- Regulatory and operational changes
- Project construction and implementation issues
- Infrastructure reliability and maintenance
- Demographic and growth uncertainty

Any of these risks and uncertainties, should they occur individually or collectively, may result in a negative impact to water supply reliability. While it is impossible to know how much risk and uncertainty to guard against, the region's reliability will be more secure with a long-term plan that recognizes risk and provides resource development to offset that risk.

Metropolitan has established an intensive, comprehensive technical process to identify key vulnerabilities to regional reliability. This Robust Decision Making (RDM) approach was used in both the 2015 and 2010 IRP Updates. The 2015 RDM approach utilized the Delta Method to examine climate change impacts to Metropolitan's water supplies across its three basins. The Delta Method is a technique that downscales data from a suite of global climate models and creates climate perturbation factors, in this case temperature and precipitation changes, and applies them to Metropolitan's baseline Integrated Water Resources Plan Simulation Model (IRPSIM) assumptions. This methodology can show how vulnerable the region's reliability is to longer-term risks such as climate change and can also establish signposts that can be monitored to see when critical changes may be happening. For example, if observed climate data shows we are trending toward more severe change and the results of the RDM analysis show an unacceptable level of reliability in this future, Metropolitan can use this as a signpost to take action. Signposts include monitoring the direction of ever-changing impacts from improved Global Climate Models, and housing and population growth patterns.

The RDM analysis was not only valuable in identifying vulnerabilities to Metropolitan's 2015 IRP approach to long-term reliability, but it was also pivotal in understanding how climate change would best be incorporated into the 2020 IRP Regional Needs Assessment and IRPSIM modeling. On the Colorado River Aqueduct, the RDM analysis helped determine that the most appropriate way to look at climate change impacts would be to alter the inflow hydrologies within the Colorado River Simulation System (CRSS) model, which would then serve as inputs to Metropolitan's IRPSIM model. On the SWP side, climate change impacts were included by altering SWP water deliveries provided in the 2019 Delivery Capability Report and derived by CalSim 2. Metropolitan assembled a panel of climate change experts to translate how specific climate change impacts, such as changes to runoff timing, would be quantified and to what degree in the IRP scenario approach.

Knowledge Sharing and Research Support

Metropolitan is an active and founding member of the Water Utility Climate Alliance (WUCA). WUCA consists of twelve nationwide water providers collaborating on climate change adaptation. As a part of this effort, WUCA pursues a variety of activities on multiple fronts.

Member agencies of WUCA annually share individual agency actions on climate change adaptation and greenhouse gas mitigation strategies and collaborate on projects aimed at advancing adaptation in the water sector. WUCA also monitors development of climate change-related research, technology, programs, and federal legislation.

In addition to supporting federal and regional efforts, WUCA has released numerous white papers and reports. In 2025, WUCA co-produced "How Do North American Water Agencies Define Water Supply Level of Service?" This report presented a framework for water supply level of service evaluation using five core elements—system dynamics, future scenarios, performance indicators, risk tolerance, and equity. In 2024, WUCA published "CMIP6

Frequently Asked Questions: A Resource for Water Managers.” This guide addresses 13 key questions designed to enhance understanding and practical application of Coupled Model Intercomparison Project, Phase 6 (CMIP6) datasets, focusing on the contiguous United States and provides clear, accessible responses to help water managers navigate and interpret these complex datasets with confidence.

In 2021, the WUCA Sea Level Rise (SLR) Committee held a virtual forum titled "Sea Level Rise Adaptation Exchange: Leading Practices for Moving from Assessment to Action." The forum gathered over 60 leaders from around the country to discuss sea level rise adaptation opportunities and barriers, including the unique challenges faced by water utilities and other infrastructure managers. The forum was part of a larger project called A Field Guide to Sea Level Rise Adaptation for the Water Sector: Moving Beyond Risk Assessment to Implementation, intended to document the leading practices in SLR adaptation for the water sector. In recent years, WUCA has created a training that rotates around the country and aims to build a community of smart consumers of climate information proactively pursuing climate adaptation in the water sector. The training sessions include learning different methods for incorporating climate change information into water resource planning, guiding principles for resilience planning, communication strategies, tactics for decision making under conditions of uncertainty, and more.

WUCA continues to pursue opportunities and partnerships with water providers, climate scientists, federal agencies, research centers, academia, and key stakeholders. Metropolitan also continues to pursue knowledge sharing and research support activities outside of WUCA. Metropolitan regularly provides input and direction on California legislation related to climate change issues. Metropolitan is active in collaborating with other state and federal agencies, as well as non-governmental organizations, on climate change-related planning issues. The following list provides a sampling of entities that Metropolitan has recently worked with on a collaborative basis:

- RAND Corporation
- U.S. Bureau of Reclamation
- U.S. Army Corps of Engineers
- American Water Works Association Research Foundation
- National Center for Atmospheric Research
- California Energy Commission
- California Department of Water Resources

Quantification of Current Research

Metropolitan continues to incorporate current climate change science into its planning efforts. A major component of the IRP scenario planning is to explicitly reflect uncertainty in Metropolitan’s future water management environment. This involves evaluating a wider range of water management strategies and seeking 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, have been incorporated into

the 2020 IRP Regional Needs Assessment and CAMP4W. Overall, Metropolitan's planning activities strive to support the Board-adopted policy principles on climate change by:

- Supporting reasonable, economically viable, and technologically feasible management strategies for reducing impacts on water supply,
- Supporting flexible "no regret" solutions that provide water supply and quality benefits while increasing the ability to manage future climate change impacts, and
- Evaluating staff recommendations regarding climate change and water resources under the California Environmental Quality Act (CEQA) to avoid adverse effects on the environment.

Implementation of Programs and Policies

Metropolitan has made great efforts to implement greenhouse gas (GHG) mitigation programs and policies for its facilities and operations. Similar to Metropolitan's approach to managing water resources, effectively reducing GHG emissions requires a portfolio approach that looks at all sources and implements strategies to reduce emissions over time. To date, these programs and policies have focused on:

- Implementing Metropolitan's Climate Action Plan (adopted by the Board in 2022), which sets the goal for carbon neutrality by 2045 and guides actions to reduce emission levels, pursuant to CEQA guidelines (See Chapter 3.8 for Metropolitan's Climate Action Plan);
- Developing Metropolitan's Energy Sustainability Plan, which identifies ways to contain energy costs, move toward energy independence, and reduce price volatility through cost-effective alternative energy partnerships and projects;
- Exploring water supply/energy relationships and opportunities to increase efficiencies;
- Participating in The Climate Registry, a nonprofit GHG emissions registry for North America that provides organizations with the tools and resources to help them calculate, verify, report, and manage their GHG emissions in a publicly transparent and credible way;
- Acquiring zero-emission fleet vehicles and supporting an employee Rideshare program;
- Installing 3.5 megawatt (MW) battery storage systems at the Jensen, Skinner, and Weymouth treatment plants;
- Developing solar power at the Jensen, Skinner, and Weymouth treatment plants;
- Identifying and pursuing development of green renewable water and energy programs that support the efficient and sustainable use of water;
- Developing a sustainable procurement policy to meet Metropolitan's commitment to procuring sustainable goods and services, supporting sustainability and climate priorities (e.g., Metropolitan's Climate Action Plan), and facilitating compliance with environmental laws and regulations; and
- Exploring carbon sequestration and developing nature-based solutions to reducing GHG emissions.

Metropolitan also continues to be a leader in efforts to increase regional water use efficiency. Metropolitan has worked to increase the availability of incentives for local conservation and recycling projects, as well as supporting conservation Best Management Practices for industry and commercial businesses. Many of Metropolitan's water use efficiency incentives also reduce customer electricity and natural gas use. In recognition of this fact, Metropolitan has Memoranda of Understanding (MOUs) with regional energy utilities to jointly implement water use efficiency programs that save energy and reduce GHG emissions.

2.7 Rate Structure

Revenue Sources and Management

A significant portion of Metropolitan's revenues is derived from volumetric water rates. In fiscal year 2025-26, water transaction revenues are projected to account for approximately 66 percent of Metropolitan's total revenues. Because volumetric revenues fluctuate with water sales, Metropolitan's financial performance is sensitive to regional weather conditions, the availability of statewide water supplies, the availability of local supplies to its member agencies, economic factors, and other variables. For example, during dry years, local demands tend to increase, resulting in higher than anticipated revenues due to increased sales volumes. Conversely, in wet years, demands tend to decline, and revenues fall with reduced sales volumes. In addition, statewide supply shortages also affect Metropolitan's revenues. Such revenue surpluses and shortages could cause instability in water rates. To mitigate this risk, Metropolitan implements various financial strategies including maintaining financial reserves, with a minimum and target balance, to help stabilize water rates during times of reduced water sales. The reserves hold revenues collected during times of high water sales and are used to offset revenues during times of low water sales.

Metropolitan also reduces rate volatility by generating a portion of revenues from fixed sources. Currently, Metropolitan has two fixed charges: the Readiness-to-Serve Charge (RTS) and the Capacity Charge. On July 8, 2025, the Board also took action to direct staff to add Treatment Fixed Charges to the proposed budget and rates the Board will consider for fiscal years 2026-27 and 2027-28. Metropolitan additionally receives tax revenue from taxable property within its service area. The revenues from fixed charges are projected to represent approximately 25 percent of total revenues in fiscal year 2025-26.

Finally, Metropolitan derives revenue from interest income, hydroelectric power sales, and miscellaneous income such as rents and leases. For fiscal year 2025-26, these sources represent approximately nine percent of total revenues. These internally generated revenues are referred to as revenue offsets and reduce the amount of revenue that must be recovered from rates and charges.

Elements of the Rate Structure

This section provides an overview of Metropolitan's rate structure. The different elements of the rate structure are discussed below and summarized in Table 2-9.

System Access Rate (SAR)

The SAR is an element of the volumetric rate for water service and recovers the costs of conveyance, distribution, and storage that is used on an average annual basis through a uniform, volumetric rate. All member agencies pay the SAR as part of water deliveries, for access to conveyance and distribution capacity in the Metropolitan system, regardless of the ownership of the water being transported.

System Power Rate (SPR)

The SPR is an element of the volumetric water rate for service and recovers the costs of energy required to pump water to Southern California through the SWP and CRA. The cost of power is recovered through a uniform, volumetric rate.

Treatment Surcharge

The Treatment Surcharge is a volumetric additional charge that recovers all of the costs of providing treatment capacity and operations. It is a uniform, volumetric rate per acre-foot of treated water transactions.

Capacity Charge

The Capacity Charge is a fixed charge that recovers the costs incurred to provide peak capacity within the distribution system. The Capacity Charge also provides a price signal to encourage agencies to reduce peak demands on the distribution system and to shift demands that occur during the May 1 through September 30 period to the October 1 through April 30 period, resulting in more efficient utilization of Metropolitan's existing infrastructure and deferring capacity expansion costs.

Readiness-To-Serve Charge (RTS) and Standby Charge

The RTS is a fixed charge that recovers the cost of the portion of the system that is available to provide emergency service and available capacity during outages and hydrologic variability. The RTS is a fixed charge that is allocated among the member agencies based on a ten-fiscal-year rolling average of firm demands. Water transfers and exchanges are included for purposes of calculating the ten-fiscal-year rolling average. The SDCWA Exchange Agreement transactions are excluded from the RTS Charge based on the contractual agreement between Metropolitan and SDCWA. The Standby Charge is an assessment collected directly from taxable properties through the county tax rolls at the request of some member agencies that have elected to use the charge as a direct offset to the member agency's RTS obligation.

Supply Rate

The Supply Rate is an element of the volumetric water rate for service charged to recover the costs of Metropolitan's supply resources. The Supply Rate supports a regional integrated approach through the uniform, postage stamp rate.

Table 2-9
Rate Structure Components

Rate Design Elements	Service Provided/ Costs Recovered	Type of Charge
System Access Rate	Conveyance/Distribution/Storage (Average Capacity), portion of Regulatory/Emergency Storage	Volumetric ($/AF)
System Power Rate	Power on the CRA and SWP	Volumetric ($/AF)
Treatment Surcharge	Treatment	Volumetric ($/AF)
Capacity Charge	Peak Distribution System Capacity, portion of Regulatory Storage	Fixed ($/cfs)
Readiness-To-Serve Charge	Available capacity for Conveyance/Distribution and Emergency Storage	Fixed ($Million)
Supply Rate	Supply, Drought Storage, Demand Management	Volumetric ($/AF)

The following tables provide further information regarding Metropolitan's rates. Table 2-10 summarizes the rates and charges effective January 1, 2025, and January 1, 2026. Average costs of Metropolitan's service by member agency will vary depending upon an agency's RTS allocation, Capacity Charge, and relative proportions of treated and untreated water purchases. Table 2-11 provides the details of the Capacity Charge, calculated for calendar year 2026. Table 2-12 provides the details of the RTS calculation for calendar year 2026 by member agency.

Table 2-10
Metropolitan Water Rates and Charges

Effective	Jan. 1, 2025	Jan. 1, 2026
Tier 1 Supply Rate ($/AF)	$290	$313
System Access Rate ($/AF)	$463	$492
System Power Rate ($/AF)	$159	$179
Full Service Untreated Volumetric Cost ($/AF)	$912	$984
Treatment Surcharge ($/AF)	$483	$544
Full Service Treated Volumetric Cost ($/AF)	$1,395	$1,528
Readiness-to-Serve Charge ($M)	$181	$188
Capacity Charge ($/cfs)	$13,000	$14,500

Table 2-11
Capacity Charge Detail for Calendar Year 2026

Agency	Peak Day Demand (cfs) (May 1 through September 30) Calendar Year				
	2022	2023	2024	3-Year Peak	Calendar Year 2026 Capacity Charge ($14,500/cfs)
Anaheim	74.5	64.0	23.9	74.5	$ 1,080,250
Beverly Hills	23.7	20.6	20.9	23.7	343,650
Burbank	8.4	16.3	15.5	16.3	236,350
Calleguas MWD	138.8	159.6	167.1	167.1	2,422,950
Central Basin MWD	47.1	53.7	50.4	53.7	778,650
Compton	0.0	3.2	0.0	3.2	46,400
Eastern MWD	187.3	190.5	233.2	233.2	3,381,400
Foothill MWD	16.1	14.9	18.1	18.1	262,450
Fullerton	15.1	13.8	24.8	24.8	359,600
Glendale	31.8	29.0	32.6	32.6	472,700
Inland Empire Utilities Agency	95.2	99.5	68.7	99.5	1,442,750
Las Virgenes MWD	34.8	37.9	30.6	37.9	549,550
Long Beach	44.1	41.5	37.9	44.1	639,450
Los Angeles	633.1	452.3	433.5	633.1	9,179,950
Municipal Water District of Orange County	282.0	233.6	258.5	282.0	4,089,000
Pasadena	38.3	33.0	35.0	38.3	555,350
San Diego County Water Authority	841.5	558.6	498.5	841.5	12,201,750
San Fernando	5.3	5.0	0.0	5.3	76,850
San Marino	4.9	4.3	4.5	4.9	71,050
Santa Ana	18.0	6.2	10.3	18.0	261,000
Santa Monica	18.0	21.0	20.1	21.0	304,500
Three Valleys MWD	86.6	110.4	98.4	110.4	1,600,800
Torrance	29.0	27.1	28.2	29.0	420,500
Upper San Gabriel MWD	25.3	11.5	16.4	25.3	366,850
West Basin MWD	173.7	171.7	175.6	175.6	2,546,200
Western MWD	177.4	181.7	180.6	181.7	2,634,650
Total	**3,050.0**	**2,560.9**	**2,483.3**	**3,194.8**	**$ 46,324,600**

Totals may not sum due to rounding.

Table 2-12
Readiness-to-Serve Charge by Member Agency for Calendar Year 2026

Member Agency	Rolling Ten-Year Average Firm Deliveries (Acre-Feet) FY 2014-15 to FY 2023-24	RTS Share	12 months @ $188 million per year (1/26-12/26)
Anaheim	23,328.3	1.84%	$ 3,457,223
Beverly Hills	9,458.6	0.75%	1,401,752
Burbank	10,532.3	0.83%	1,560,873
Calleguas MWD	85,497.7	6.74%	12,670,645
Central Basin MWD	30,647.0	2.42%	4,541,845
Compton	8.3	0.00%	1,230
Eastern MWD	96,954.0	7.64%	14,368,454
Foothill MWD	8,062.2	0.64%	1,194,807
Fullerton	6,128.6	0.48%	908,250
Glendale	14,676.3	1.16%	2,175,008
Inland Empire Utilities Agency	54,727.4	4.31%	8,110,528
Las Virgenes MWD	18,431.7	1.45%	2,731,553
Long Beach	26,463.1	2.09%	3,921,796
Los Angeles	242,114.6	19.09%	35,881,061
Municipal Water District of Orange County	172,537.1	13.60%	25,569,769
Pasadena	18,267.3	1.44%	2,707,190
San Diego County Water Authority	145,667.0	11.48%	21,587,655
San Fernando	470.7	0.04%	69,757
San Marino	990.4	0.08%	146,776
Santa Ana	7,865.5	0.62%	1,165,657
Santa Monica	5,039.7	0.40%	746,877
Three Valleys MWD	60,225.0	4.75%	8,925,265
Torrance	14,683.8	1.16%	2,176,120
Upper San Gabriel Valley MWD	40,189.6	3.17%	5,956,045
West Basin MWD	108,841.6	8.58%	16,130,180
Western MWD	66,759.6	5.26%	9,893,684
Total	**1,268,567.4**	**100.00%**	**$ 188,000,000**

Totals may not sum due to rounding.

Implementing the Plan 3

This section summarizes Metropolitan's implementation plans and continued progress in developing a diversified resource mix that enables the region to meet its water demands under a wide range of possible future conditions. The investments that Metropolitan has made and its ongoing efforts in many different areas coalesce toward its goal of long-term regional water supply reliability. Many of the resource programs discussed are already successfully implemented. Others will take more time to execute. Considerations are also in place for emerging integrated supplies, which could augment sources of regional water supply from non-traditional sources. In addition, water demand reductions brought about by legislative mandates could affect the landscape of future supply planning and implementation. The following sections discuss each of these programs, presenting both successes to date and the programs that are still underway.

Metropolitan's implementation approach is consistent with the California Water Resilience Portfolio that was released in July 2020. The California Water Resilience Portfolio is discussed briefly below.

California Water Resilience Portfolio

On April 29, 2019, Governor Newsom issued Executive Order N-10-19 that directed the California Natural Resources Agency, the California Environmental Protection Agency, and the California Department of Food and Agriculture to prepare a water resilience portfolio that meets the needs of California's communities, economy and environment through the 21st century.

The California Water Resilience Portfolio outlines goals and actions to help address the state's water challenges through a broad and diversified approach. The goals and actions are meant to be achieved region by region based on the unique challenges and opportunities in each area and are organized into four categories:

1. Maintain and diversify water supplies – the state will continue to help regions reduce reliance on any one source of water supply and diversify water supplies to enable flexibility in the face of changing conditions.
2. Protect and enhance natural ecosystems – the state will provide leadership in restoring the environmental health of our river systems through effective standard setting, continued investments, and more adaptive and holistic environmental management.
3. Build connections – the state aims to improve infrastructure to store, move, and share water more effectively, and to integrate water management through shared use of science, data, and technology.

4. Be prepared – the state will provide guidance to support preparation, protective actions, and adaptive management of regions in the face of new threats and stresses due to climate change.

3.1 Colorado River

Metropolitan's goal for the Colorado River is to maintain current supplies and programs, while also maintaining flexibility through dry-year programs and storage. This goal involves protecting existing supply and storage programs in the face of risks that could impact Colorado River supplies in the future.

Background

Metropolitan was established to obtain an allotment of Colorado River water, and its first mission was to construct and operate the Colorado River Aqueduct (CRA). Under its contracts with the federal government, Metropolitan has a basic fourth priority entitlement of 550,000 acre-feet (AF) per year of Colorado River water. Metropolitan also holds a fifth priority for an additional 662,000 AF per year that exceeds California's 4.4 million acre-feet (MAF) per year basic apportionment, and another 180,000 AF per year when surplus flows are available. Metropolitan can obtain water under the fifth priority from:

- Water unused by the California holders of priorities 1 through 3,
- Water saved by the Palo Verde Land Management, Crop Rotation, and Water Supply Program,
- Water saved by the IID-Metropolitan Conservation Program,
- Water saved by the Metropolitan/Bard Seasonal Fallowing Program,
- Water saved by the Metropolitan/Quechan Seasonal Fallowing Program,
- Water forborne by the Quechan Diversion Forbearance Program, or
- When the U.S. Secretary of the Interior makes available either or both:
    - Surplus water, and
    - Water apportioned to, but unused by, Arizona and/or Nevada.

To satisfy a condition imposed by Congress in the Boulder Canyon Project Act, California's legislature enacted the Limitation Act in 1929, agreeing to limit consumptive use of Colorado River water to 4.4 MAF per year, plus not more than one-half of any excess or surplus waters unapportioned by the Colorado River Compact. The 1931 Seven Party Agreement provides the basis for the priorities among California contractors' use of Colorado River water available to California. Palo Verde Irrigation District (PVID), the Yuma Project (Reservation Division), Imperial Irrigation District (IID), and Coachella Valley Water District (CVWD), collectively the "agricultural entities," and Metropolitan are the entities that currently hold the priorities. These priorities are included in the contracts that the Department of the Interior executed with the California agencies in the 1930s for delivery of water from Lake Mead. The first four priorities total 4.4 MAF per year. As noted above, Metropolitan has the fourth priority of 550,000 AF to California's basic apportionment and the fifth priority to 662,000 AF per year. Under priorities 1 through 3, an amount not to exceed 3.85 MAF was apportioned to the agricultural entities for beneficial consumptive use. The Seven Party Agreement did not specify individual quantities for each of the first three priorities; rather, the amount of water available under the third priority was limited to the amount unused by the holders of priorities 1 and 2 on designated areas of land. This

lack of quantification among the agricultural priorities posed an obstacle to the acquisition of water from the agricultural entities for use in Metropolitan's service area.

The Consolidated Decree issued in 2006 by the U.S. Supreme Court in *Arizona v. California*, consolidated into one decree the initial 1964 decree, the 1979 supplemental decree, the 1984 second supplemental decree, the 2000 third supplemental decree, and the 2006 approval settlements reached on the water rights claim of the Fort Yuma Indian Reservation. The Consolidated Decree confirmed the normal year allocation of 4.4 MAF per year to California. This limit effectively reduced Metropolitan's dependable supply of Colorado River water to its fourth priority amount of 550,000 AF per year. The Consolidated Decree quantified present perfected rights (PPRs) to the use of Colorado River water by certain Indian reservations, federal wildlife refuges, and other users. Within California some, but not all, of these PPRs are encompassed by the Seven Party Agreement. Consumptive use under these non-encompassed PPRs, known as "Miscellaneous and Indian PPRs," could reach as much as 61,000 AF annually. Since 1985, these PPR holders have used less than 20,000 AF annually. Because over 5.362 MAF of Colorado River water were already allocated by California's Seven Party Agreement, it was not clear which rights would be affected by the use of these non-encompassed PPRs.

For a period following the Court's 1964 decree, Metropolitan's fifth priority rights were satisfied with water unused under California's first three agricultural priorities and water allocated to, but unused by, Arizona and Nevada. With the commencement of Colorado River water deliveries to the Central Arizona Project in 1985, the availability of Colorado River water to meet Metropolitan's needs was determined on a year-by-year basis. Through 2002, Metropolitan's diversion requests were fully satisfied with unused supplies and surplus waters.

Figure 3-1 shows the major aqueducts within Southern California including those from the Colorado River, and entities within the state having rights to use water from the Colorado River.

Figure 3-1
California Entities Using Colorado River Water



Changed Conditions

California's Colorado River Water Use Plan and the Quantification Settlement Agreement

In 1999, Metropolitan and the State of California acknowledged that Metropolitan would obtain less water from the Colorado River in the future than in the past, but the lack of clearly quantified water rights hindered efforts to promote water management projects. The Secretary of the Interior asserted that California's users of Colorado River water had to limit their use to a total of 4.4 MAF per year, plus any available surplus water. Under the auspices of the state's Colorado River Board, these users developed a draft plan to resolve the problem, which was known as "California's Colorado River Water Use Plan" or the "California Plan." It characterized how California would develop a combination of programs to allow the state to limit its annual use of Colorado River water to 4.4 MAF per year, plus any available surplus water. Key elements of the California Plan became part of the framework for the 2003 Quantification Settlement Agreement (QSA) among IID, CVWD, and Metropolitan. The QSA establishes the baseline water use for each of the agencies, facilitates the transfer of water from agricultural agencies to urban uses, and specifies that IID, CVWD, and Metropolitan would forbear use of water to permit the Secretary of the Interior to satisfy the uses of the PPRs not covered by the Seven Party Agreement.

On November 5, 2003, IID filed a validation action in Imperial County Superior Court, seeking a judicial determination that thirteen agreements associated with the QSA are valid, legal, and binding. Other lawsuits also were filed challenging the execution, approval, and subsequent implementation of the QSA on various grounds. All of the QSA cases were coordinated in Sacramento County Superior Court. After more than a decade of litigation, the final challenges to the QSA were dismissed, and the agreements were upheld.

The San Diego County Water Authority (SDCWA) participated in three QSA-related projects that provide additional water supplies that the agency exchanges with Metropolitan for receipt of Metropolitan deliveries. First, the water conserved by the IID conservation projects is made available to Metropolitan. In exchange, Metropolitan delivers an equal amount of Metropolitan water to SDCWA. Second, federal law allocates a portion of the water available as a result of the Coachella Canal Lining Project and the All-American Canal Lining Project for the benefit of parties, including five Indian Bands and two non-Indian municipal water purveyors (San Luis Rey Settlement Parties). Metropolitan agreed to receive that water and, in exchange, provide at the MWD-SDCWA connections an equal amount of Metropolitan water to the United States for use by the San Luis Rey Settlement Parties, and SDCWA agreed to convey the water through its distribution system when capacity is available to the San Luis Rey Settlement Parties' service areas. Third, the remainder of the water available as a result of the canal lining projects, up to the cap specified in the Metropolitan-SDCWA exchange agreement, is made available to Metropolitan and exchanged for Metropolitan deliveries to SDCWA.

In 2005, Metropolitan entered into a settlement agreement in Arizona v. California with the Quechan Indian Tribe and other parties. The Tribe uses Colorado River water on the Fort Yuma Indian Reservation, which is part of the Yuma Project Reservation Division. Under the settlement agreement, the Tribe, in addition to the amounts of water decreed for the benefit of the Reservation in the 1964 decree in Arizona v. California, is entitled to (a) 20,000 AF of diversions from the Colorado River, or (b) the amount necessary to supply the

consumptive use required for irrigation of a specified number of acres, and for the satisfaction of related uses, whichever is less. Of the additional diversions, 13,000 AF became available to the Tribe in 2006. An additional 7,000 AF becomes available to the Tribe in 2035. Metropolitan agreed to provide annual incentive payments to the Tribe if the Tribe forbears diversion of the additional water, thereby allowing Metropolitan to divert it.

Current Dry Condition

The Colorado River Basin experienced a severe 5-year drought from 2000 to 2004 with both precipitation and runoff significantly below average. Since that time, precipitation has been, on average, near normal, while runoff has been less than average in approximately two out of every three years. Overall, a potential change in the precipitation to runoff relationship may be resulting in conditions in which less runoff is generated from a given level of precipitation, pushing the system toward a drying trend that is often characterized as a long-term drought. For example, in 2020, the Upper Colorado River Basin snowpack peaked in April at 107 percent of the median. However, April through July runoff was observed at just 52 percent of average due to hot and dry conditions in the late spring and early summer. Similarly, in 2025, snowpack peaked at 93 percent of normal in late March while water year inflows to Lake Powell were only 49 percent of normal. The overall drying trend has left Lake Mead storage at 33 percent of capacity and Lake Powell storage at 28 percent of capacity by the end of 2025, providing less of a buffer for a future period of reduced precipitation.

Invasive Mussels

Quagga mussels were discovered in January of 2007 in Lake Mead and rapidly spread downstream to the Lower Colorado River. The presence and spawning of quagga mussels in the Lower Colorado River and in reservoirs located in Southern California pose an immediate threat to water and power systems in the southwestern United States. Quagga mussels (*Dreissena bugensis*) are a species related to the better-known zebra mussels (*Dreissena polymorpha*) and are indigenous to Ukraine. They were introduced to the Great Lakes in the 1980s from the freshwater ballast of a transoceanic ship traveling from Eastern Europe.

Recently, quagga mussels have become a challenge for the western branch of the State Water Project. As Metropolitan began its mitigation plans for quagga mussels in the State Water Project, golden mussels were detected in the system and also pose a threat. Golden mussels (*Limnoperna fortunei*) were discovered in the Sacramento-San Joaquin Delta in October 2024 and are rapidly spreading through the SWP. These invaders are similar to quagga and zebra mussels in that they can rapidly spread and alter ecosystems. Although the introduction of these species into drinking water supplies does not typically result in a violation of drinking water standards, invasive mussel infestations can adversely impact aquatic environments and infrastructure. On September 3, 2025, the California Department of Water Resources (DWR) confirmed the presence of a golden mussel veliger in a sample from Silverwood Lake. This finding, verified through DNA sequencing, represents the southernmost detection of golden mussels in the SWP to date. If unmanaged, invasive mussel infestations have been known to severely impact the aquatic ecology of lakes and rivers; clog intakes and raw water conveyance systems; reduce the recreational and

aesthetic value of lakes and beaches; alter or destroy fish habitats; and render lakes more susceptible to deleterious algae blooms.

Implementation Approach

Metropolitan's planning strategy recognized explicitly that program development would play an important part in reaching the target level of deliveries from the Colorado River. The implementation approach explored a number of water conservation programs with water agencies that receive water from the Colorado River or are located in proximity to the CRA. Negotiating the QSA was a necessary first step for all of these programs. On October 10, 2003, after lengthy negotiations, representatives from Metropolitan, IID, and CVWD executed the QSA and other related agreements. Parties involved also included SDCWA, DWR, the California DFW, the U.S. Department of the Interior, and the San Luis Rey Settlement Parties. One of those related agreements was the "Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement," which specifies to which agencies water will be delivered under priorities 3a and 6a of the Seven Party Agreement during its term.

Metropolitan has identified several programs that could be used to achieve the regional long-term development targets for the Colorado River, as shown in Table 3-1. Metropolitan has entered into or is exploring agreements with agencies as described in this section. In addition, Appendix 3 provides a detailed discussion of these programs and describes whether the programs are being implemented, are deferred, or are under investigation.

Colorado River Water Management Programs

Imperial Irrigation District/Metropolitan Water District Conservation Program

Under agreements executed in 1988 and 1989, Metropolitan funded water efficiency improvements within IID's service area in return for the right to divert the water conserved by those investments. Under this program, IID implemented a number of structural and non-structural measures, including the lining of existing earthen canals with concrete, constructing local reservoirs and spill-interceptor canals, installing non-leak gates, and automating the distribution system. Other implemented programs include the delivery of water to farmers on a 12-hour rather than a 24-hour basis and improvements in on-farm water management through irrigation management improvements. Through this program, IID conserves an additional 105,000 AF per year. Execution of the QSA and amendments to the 1988 and 1989 agreements resulted in changes in the availability of water under the program, extending the term to 2078 if the term of the QSA extends through 2077, which guaranteed Metropolitan at least 85,000 AF per year with the remainder of the conserved water available to CVWD when needed. In a 2019 agreement, Metropolitan and CVWD agreed to increase the amount of water guaranteed to Metropolitan to 90,000 AF per year from 2020 to 2026, with the remainder of the conserved water to be delivered by Metropolitan to CVWD at Whitewater.

Palo Verde Land Management, Crop Rotation, and Water Supply Program

In May 2004, Metropolitan's Board authorized a 35-year land management, crop rotation, and water supply program with PVID (PVID Program). Under the program, participating farmers in PVID are paid to reduce their water use by not irrigating a portion of their land. A maximum of 29 percent of the lands within the Palo Verde Valley can be fallowed in any

given year. Under the terms of the QSA, water savings within the PVID service area are made available to Metropolitan. This program makes available up to 133,000 AF of water to Metropolitan in certain years. Over the life of the program, an average of 84,500 AF per year has been saved and made available to Metropolitan. Additionally, in March 2009, Metropolitan and PVID entered into a one-year supplemental fallowing program within PVID that provided for the fallowing of additional acreage, with savings of 24,100 AF in 2009 and 32,300 AF in 2010. In August 2023, Metropolitan entered into an agreement with the U.S. Bureau of Reclamation (USBR) whereby USBR will fund the PVID Program to conserve system water for Lake Mead through 2026.

Bard Seasonal Fallowing Program

In December 2019, Metropolitan's Board authorized a seven-year seasonal fallowing program with the Bard Water District (Bard Program). Under the program, participating farmers in Bard are paid to reduce their water use by not irrigating their land between the late spring and summer months. A maximum of 3,000 acres will be fallowed in the Bard Unit. Estimated water savings are between 1.5 and 2.0 AF per irrigable acre. Bard is part of the Yuma Project Reservation Division. Bard therefore holds a higher priority than Metropolitan, and any reductions in their water consumption increases supplies available to Metropolitan. Metropolitan has the option to make a fallowing call every year. The fallowing call notifies Bard and the farmers if Metropolitan needs fallowing the following year.

In September 2024, Metropolitan entered into a System Conservation Implementation Agreement (SCIA) with USBR. Under that agreement, USBR agreed to fund the Bard Program through 2026 to produce system water to be stored in Lake Mead. In February 2025, Metropolitan and USBR amended the SCIA to include an additional 3,000 acres in the Bard Program for fallowing in years 2025 and 2026. Before the amendment, the Bard program had a maximum of 6,000 acres eligible to be fallowed.

The program now makes available up to 12,000 AF of water in certain years.

Management of Metropolitan-Owned Land in Palo Verde

In 2001, Metropolitan acquired 8,946 acres of irrigable farmland within the Palo Verde Irrigation District (PVID). These lands were leased to growers and were eventually enrolled in the PVID Land Management, Crop Rotation, and Water Supply Program when it began in 2005. In 2015, Metropolitan acquired an additional 12,049 irrigable acres from Verbena LLC, bringing Metropolitan's ownership in the Palo Verde Valley to approximately 20,995 acres of irrigated farmland. The lands have historically been leased to growers who produce high water-using crops such as alfalfa.

In 2017 and 2018, Metropolitan entered into new leases on the lands with the goal of reducing consumptive water use while maintaining the lands as productive farmland. Strategies for reducing water use include incentivizing lessees to grow lower water-use crops, experimenting with different crop rotation cycles, and studying alternative irrigation practices. To assist in these studies, Metropolitan has deployed technologies for measuring crop water use via remote sensing imagery and ground-based sensors.

If long-term water savings from these farm leases is realized, Metropolitan may explore ways to have them formally accounted for in Metropolitan's Colorado River supplies in the future.

Southern Nevada Water Authority and Metropolitan Storage and Interstate Release Agreement

The SNWA has undertaken extraordinary water conservation measures to maintain its consumptive use within Nevada's basic apportionment of 300,000 AF. The success of the conservation program has resulted in unused basic apportionment for Nevada. As SNWA expressed interest in storing a portion of the water with Metropolitan, the agencies, along with the United States and the Colorado River Commission of Nevada, entered into a storage and interstate release agreement in October 2004. Under the agreement, additional Colorado River water supplies are made available to Metropolitan when there is space available in the CRA to receive the water. SNWA stored approximately 422,000 AF with Metropolitan through 2019, 330,000 AF of which is available for return to SNWA. In addition to providing capacity for SNWA to store unused water, the program has been beneficial to Metropolitan, providing additional water during dry years, especially during the 2011-2016 California drought. SNWA is not expected to call upon Metropolitan to return water until after 2026.

Lower Colorado Water Supply Project

The Lower Colorado Water Supply Project was authorized by Congress in the 1980s to provide up to 10,000 AF of water per year to the City of Needles and other entities adjacent to the river in California that do not have rights or have insufficient rights to use Colorado River water. In March 2007, Metropolitan, the City of Needles, and USBR executed a Lower Colorado Water Supply Project contract. Under the contract, Metropolitan receives, on an annual basis, project water left unused by the project contractors along the River. The water supply for the project comes from groundwater wells located along the All-American Canal. A portion of the payments made by Metropolitan to the City of Needles is placed in a trust fund for potentially acquiring a new water supply for the project should the groundwater pumped from the project's wells become too saline for use. Metropolitan received 9,500 AF from this project in 2024 and will receive an estimated 9,000 AF in 2025 based on the amount of water pumped and used by other project water users.

Exchange with SDCWA

Under the 2003 Quantitative Settlement Agreement, SDCWA acquired conserved Colorado River water in an escalating annual volume that reached 277,700 AF in 2021. The conserved water is acquired by SDCWA through its transfer agreement with the Imperial Irrigation District (IID) and from the lining of the All-American and Coachella canals. SDCWA and Metropolitan entered into an exchange agreement in 2003 for exchange of that water. SDCWA makes this water available at Metropolitan's Colorado River Intake on Lake Havasu, up to 277,700 AF, for Metropolitan diversion, where Metropolitan takes ownership of the water and, in exchange, provides a matching volume of Metropolitan's water to SDCWA (Exchange Water). Under the transfer agreement with IID, 200,000 AF was transferred and exchanged with Metropolitan in 2023, and will be each year of the agreement moving forward. The water is being conserved through on-farm efficiency conservation arrangements made by IID with its customers and other system efficiency measures.

The Coachella Canal Lining Project consists of a 35-mile concrete-lined canal, including siphons, which replaced an earthen canal. The project was completed in December 2006

and conserves 30,850 AF annually. The All-American Canal Lining Project consists of a concrete-lined canal constructed parallel to 23 miles of earthen canal. The project was completed in 2009 and conserves 67,700 AF annually.

Pursuant to the QSA and related agreements, the 98,550 AF of water resulting from these projects annually is allocated as follows: 16,000 AF to the San Luis Rey Settlement Parties in San Diego County, 77,700 AF to SDCWA, and 4,850 AF for the Coachella Canal Lining Project mitigation. Any portion of the latter volume not used for mitigation is allocated to SDCWA; however, whether SDCWA can actually receive such water is subject to other laws, agreements, and factors.

The combined volume of IID-transferred water and canal lining water that SDCWA will exchange with Metropolitan is limited to 277,700 AF each year.

In 2025, following many years of litigation between the parties, SDCWA and Metropolitan entered into a settlement agreement that amended the Exchange Agreement (the “2025 Exchange Agreement”). Under the terms of the 2025 Exchange Agreement, SDCWA pays a minimum amount for exchange of 227,000 AF of water from Metropolitan each year at an agreed-upon exchange price, whether or not SDCWA makes that amount available to Metropolitan for exchange. SDCWA may still exchange up to 277,700 AF with Metropolitan. Monthly deliveries may be variable to meet SDCWA’s variable demands. SDCWA may also offer to sell exchange water deliveries to Metropolitan member agencies as a right of first refusal, and Metropolitan has a right of second refusal to buy SDCWA’s Colorado River water at Metropolitan's Colorado River Intake on Lake Havasu if no member agency purchases exchange deliveries from SDCWA.

Any sales of Exchange Water deliveries by SDCWA to a member agency change only the location of the deliveries, but keep the water within Metropolitan’s service area. Additional operational and other conditions apply to the rights of refusal under the 2025 Exchange Agreement.

Exchange with the United States

The United States furnishes the 16,000 AF allocated to the San Luis Rey Settlement Parties from the water conserved from the All-American Canal Lining Project and Coachella Canal Lining Project at Metropolitan’s Colorado River Intake on Lake Havasu. Metropolitan takes possession of the water and, by exchange, delivers an equal volume of Metropolitan’s supplies to SDCWA. By separate agreement, SDCWA conveys the water to the San Luis Rey Settlement Parties.

Lake Mead Storage Program

In May 2006, Metropolitan and USBR executed an agreement for a demonstration program that allowed Metropolitan to leave conserved water in Lake Mead, for exclusive use by Metropolitan in later years, which Metropolitan would otherwise have used in 2006 and 2007. The program required that such storage in Lake Mead be generated through reduced use resulting from implementation of extraordinary conservation measures and not simply be water that was not needed by Metropolitan in the year it was stored. This extraordinary conservation was accomplished through the Palo Verde Land Management, Crop Rotation, and Water Supply Program. Through the two-year demonstration program, Metropolitan created 44,800 AF of Intentionally Created Surplus (ICS) water.

In December 2007, Metropolitan entered into agreements that set forth the rules under which ICS water may be created, stored in, and delivered from Lake Mead. According to these rules, the amount of water stored in Lake Mead, created through extraordinary conservation, that is available for delivery in a subsequent year was reduced by a one-time deduction of five percent, resulting in additional system water in the lake, and an annual evaporation loss of three percent, beginning in the year following the year the water is stored. The 2019 Lower Basin Drought Contingency Plan (Lower Basin DCP; see below) changed these rules such that, for ICS creators party to the DCP (including Metropolitan), a one-time ten-percent deduction is assessed on ICS in the year it is created, without additional future evaporation losses. Metropolitan created ICS in 2009, 2010, 2011, 2012, 2016, 2017, 2018, 2019, 2020, and 2023, and withdrew ICS in 2008, 2013, 2014, 2015, 2021, and 2022. In 2024, ICS was neither created nor delivered. As of January 1, 2025, Metropolitan had a total of 1.457 MAF of Extraordinary Conservation ICS water in Lake Mead.

Under these agreements, Metropolitan also agreed to store excess conservation from IID, up to 25,000 AF per year with a cumulative cap of 50,000 AF, with return upon the request of IID, subject to the conditions of the agreement. These terms were amended in 2015 to temporarily increase the amount of excess conservation that Metropolitan would store, to account for the success of IID's conservation programs and the extreme drought conditions within the State of California. Metropolitan stored water for IID in 2014, 2015, 2016, 2017, 2021, and 2022. As of January 1, 2025, IID has storage credits of approximately 250,000 AF with Metropolitan. Stored supplies consist of IID's excess conservation, either through application of the California ICS Agreement and its amendment, through application of 3.B.8 of the 2007 Interim Guidelines (aka Lake Mead Storage Program), or through a 2021 agreement.

The December 2007 federal guidelines concerning the operation of the Colorado River system reservoirs provided the ability for agencies to create System Efficiency ICS through the development and funding of system efficiency projects that save water that would otherwise be lost from the Colorado River. To that end, in 2008 the Central Arizona Water Conservation District (CAWCD), SNWA, and Metropolitan contributed funds for the construction of the Drop 2 (Brock) Reservoir by USBR. The purpose of the Brock Reservoir is to increase the capacity to regulate deliveries of Colorado River water at Imperial Dam, reducing the amount of lost storage in Lake Mead due to excess flow downstream of Imperial Dam by approximately 70,000 AF annually. In return for its $25 million net contribution toward construction, operation, and maintenance, USBR assigned to Metropolitan 100,000 AF of water stored in Lake Mead as System Efficiency ICS. Through 2024, Metropolitan has diverted 35,000 AF of this amount, with 65,000 AF remaining in storage.

In 2009, Metropolitan entered into an agreement with the United States, SNWA, Colorado River Commission of Nevada (CRCN), and CAWCD to have USBR conduct a one-year pilot operation of the Yuma Desalting Plant at one-third capacity. The pilot project operated between May 2010 and March 2011 and provided data for future decision-making about the long-term operation of the plant and developing a near-term water supply. Metropolitan's contribution toward plant operating costs secured 24,400 AF of System Efficiency ICS, which is still stored in Lake Mead as of January 1, 2025.

Per the terms of Minutes 319 and 323 to the 1944 U.S. Treaty with Mexico, Metropolitan entered into agreements with the United States, SNWA, CRCN, CAWCD, and IID to fund conservation projects in Mexico resulting in Binational ICS (BICS) stored in Lake Mead for the benefit of the agreement parties. Based on this arrangement, Metropolitan received 23,750 AF of BICS in 2017 and 9,092 AF of BICS in 2020, for a total of 32,842 AF of BICS stored in Lake Mead as of January 1, 2025. Per the terms of the agreements, Metropolitan will receive an additional 18,183 AF of BICS in 2026.

Invasive Mussel Control Program

The presence and spawning of quagga mussels in the lower Colorado River from Lake Mead through Lake Havasu pose a threat to Metropolitan's Colorado River Aqueduct (CRA) system and other Colorado River water users due to the potential to continuously seed water conveyance systems with mussel larvae.

Metropolitan developed the Quagga Mussel Control Program (QMCP) in 2007 to address the long-term introduction of mussel larvae into the CRA from the lower Colorado River. The QMCP consists of surveillance activities and control measures. Inspections for adult mussel infestation of submerged infrastructure are conducted during annual CRA shutdowns (usually three to four weeks). Microscopic larvae are routinely monitored throughout the year in infested lakes and at non-infested locations.

Control activities consist of continuous chlorination of the CRA system (target residual = 0.1–0.5 mg/L) at the outlets of Copper Basin (5 miles downstream of the intake from the Colorado River), Lake Skinner, and Lake Mathews at the western terminus of the CRA. The outlet towers at Lakes Skinner and Mathews are also chlorinated for two weeks every quarter when operations allow (0.4–0.6 mg/L target chlorine residual). Attached mussels are removed during routine cleaning of the trash racks at the Whitsett Intake Pumping Plant at the start of the CRA. The annual CRA shutdowns desiccate exposed quagga mussels, thus providing an additional control measure.

Recent shutdown inspections have demonstrated that the combined use of chlorine and regularly scheduled shutdowns effectively control mussel infestation along the length of the CRA since only a few small mussels are usually found during these inspections.

In December 2016, a few adult quagga mussels were first discovered in Pyramid Lake on the West Branch of the SWP. In August 2021, a few adult quagga mussels were discovered in Castaic Lake, but no confirmed veliger-stage mussels were reported in monitoring conducted from that time through 2022. However, in January 2023, Metropolitan detected a single quagga mussel veliger at Metropolitan's Foothill Feeder Pressure Control Structure (FFPCS) immediately downstream of Castaic Lake. The finding was shared with the California Department of Fish and Wildlife and the California Department of Water Resources. Additional quagga mussel veligers have since been detected on a routine basis between Castaic Lake and the Jensen Treatment Plant, with infestation of the West Branch SWP becoming firmly established in 2024, and increasing numbers of adult mussels have been observed in Castaic Lake. Results for 2024 monitoring have shown increasing numbers of quagga mussel veligers in FFPCS and Jensen Plant influent samples. As a consequence, Metropolitan began implementing control measures for operations on the West Branch of the SWP and submitted its first quagga mussel control Raw Water

Discharge Plan in 2024 for that part of Metropolitan's system. Monitoring and interagency coordination efforts continue.

In the past, quagga mussels have driven Metropolitan's control plan, necessitating an expansion update as they established themselves in the West Branch of the SWP. With the discovery of golden mussels in the SWP, a control plan will also be required to address their presence. Golden mussels are expected to be effectively managed by the same control measures used for quagga mussels, and Metropolitan is expanding its control plan to include golden mussels, evolving the QMCP into an all-encompassing Invasive Mussel Control Plan. Leveraging lessons from the 2007 CRA quagga mussel control program, Metropolitan initiated a multi-disciplinary task force to develop a three-phased approach for mussel mitigation and control at Metropolitan facilities receiving SWP supplies. Phase I includes increased monitoring and testing, feasibility studies, and conceptual design of prioritized infrastructure upgrades, vulnerability assessments, and near-term mitigation measures utilizing rapidly deployable portable equipment. Phase I will also involve developing a conceptual design for chemical injection or other control measures to control mussel and veliger growth at critical locations, such as Jensen Water Treatment Plant, Magazine Canyon, and Live Oak Reservoir. Phase II will implement prioritized infrastructure upgrades identified in Phase I of the initiative. Phase III will address long-term needs focused on refining mitigation strategies for district-wide invasive mussel control. In October 2025, Metropolitan's board approved amending the Capital Investment Plan for fiscal years 2024-25 and 2025-26 to include invasive mussel mitigation and control at Metropolitan facilities and authorized an increase of $500,000 in the operating equipment budget for the current biennium to purchase equipment to control the growth of invasive mussels.

Lower Basin Drought Contingency Plan

In April 2019, the President signed legislation directing the Secretary of the Interior to sign and implement four DCP agreements related to the Upper and Lower Basin DCPs without delay. The agreements were executed, and the Upper and Lower Basin DCPs became effective on May 20, 2019, and expire in 2026. The Lower Basin Drought Contingency Plan Agreement requires California, Arizona, and Nevada to store defined volumes of water (DCP Contributions) when lake elevations drop below certain levels. However, California was not required to make any DCP Contributions during the period of the agreement since Lake Mead levels remained above the relevant threshold for California (1,045 feet). Although the DCP expires in 2026, the determination that California is not required to make DCP Contributions in 2026 has already been made as part of USBR's 2026 Annual Operating Plan, which was published prior to the publication of this UWMP.

Implementation of the Lower Basin DCP enhanced Metropolitan's ability to store water in Lake Mead and to ensure that water in storage can be delivered at a later date. The Lower Basin DCP increased the total volume of water that California may store in Lake Mead as ICS by 200,000 AF. Water stored as ICS will be available for delivery through 2036 as long as Lake Mead's elevation remains above 1,025 feet. Under the 2007 Interim Guidelines alone, that water would likely have become inaccessible below a Lake Mead elevation of 1,075 feet. DCP Contributions may be made through conversion of existing ICS or through the simultaneous creation of ICS and conversion to DCP ICS. This type of DCP Contribution becomes DCP ICS, which is recoverable if Lake Mead elevation exceeds

1,110 feet. DCP Contributions may also be made by leaving in Lake Mead water to which there was a legal right of delivery. This type of DCP Contribution becomes system water and may not be recovered. The Lower Basin DCP Agreement set rules for delivery of DCP ICS through 2026 and between 2027 to 2057.

Supplement to the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead

In May 2024, USBR issued a Record of Decision (ROD) on its Supplement to the 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead. This ROD allowed for reduced releases from Lake Powell (down to 6 MAF) and set a goal for the Lower Basin states to implement 3 MAF of conservation through 2026, including 1.5 MAF by the end of 2024. To help meet these conservation targets, Metropolitan committed most of the water conserved through its rotational fallowing program with PVID, its seasonal fallowing program with the Bard Water District, and its diversion forbearance program with the Quechan Indian Tribe to Lake Mead as system water. During this period, USBR is carrying the costs associated with the programs. The Lower Basin states exceeded the target of conserving 1.5 MAF by the end of 2024, and as of December 2024, they have more than enough conservation activity under contract to meet the 3 MAF target by the end of 2026.

Achievements to Date

Metropolitan has developed a number of supply and conservation programs to increase its supply available from the Colorado River. The Colorado River faces long-term challenges of water demands exceeding available supply, with additional uncertainties due to climate change. Metropolitan's supply and conservation programs, as well as planned additional water management programs for 2040 are shown in Table 3-1.

Colorado River Program Capabilities
Calendar Year 2040
(acre-feet per year)

Hydrology	Five-Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2017)
Current Programs			
Basic Apportionment – Priority 4	550,000	550,000	550,000
DCP contribution[1]	(77,500)	(75,000)	(75,000)
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment (Surplus)	0	0	0
PVID Land Management, Crop Rotation, and Water Supply Program	120,000	120,000	120,000
Lower Colorado Water Supply Project	9,000	9,000	9,000
Lake Mead ICS Storage Program	270,000	400,000	400,000
Binational ICS	0	0	0
Forbearance for Present Perfected Rights	(2,000)	(2,000)	(2,000)
CVWD SWP/QSA Transfer Agreement	(35,000)	(35,000)	(35,000)
DWCV SWP Table A Obligation	(48,000)	(6,000)	(140,000)
DWCV Advance Delivery Account	48,000	6,000	140,000
Quechan Seasonal Fallowing Program	2,000	2,000	2,000
Quechan Diversion Forbearance Program	10,000	10,000	10,000
IID Payback	0	0	0
SNWA Agreement Payback	(22,000)	(22,000)	(22,000)
Subtotal of Current Programs	***909,500***	***1,042,000***	***1,042,000***
Programs Under Development			
Additional Transfer Programs	0	0	0
Subtotal of Proposed Programs	***0***	***0***	***0***
Additional CRA Exchange Supplies			
Exchange with SDCWA/IID Transfer	200,000	200,000	200,000
Coachella & All-American Canal Lining			
To SDCWA	78,000	78,000	78,000
To United States	16,000	16,000	16,000
Subtotal of Additional Colorado River Supplies	***294,000***	***294,000***	***294,000***
Maximum CRA Supply Capability[2]	**1,203,500**	**1,336,000**	**1,336,000**
Less CRA Capacity Constraint (amount above 1.25 MAF)	-	*(86,000)*	*(86,000)*
Maximum Expected CRA Deliveries[3]	**1,203,500**	**1,250,000**	**1,250,000**

Notes:
1. DCP is extended through the forecast as a proxy for anticipated reductions borne out of the Post-2026 Colorado River Negotiations. When new regulations are finalized, these numbers will change.
2. Total amount of supplies available without taking into consideration CRA capacity constraint.
3. The Colorado River Aqueduct delivery capacity is 1.25 MAF annually.

3.2 State Water Project

The State Water Project (SWP) is a multi-purpose water storage and delivery system that serves 27 million Californians and 750,000 acres of farmland via 29 urban and agricultural agencies throughout California, from north of the Delta to Southern California. The SWP consists of a series of pump stations, reservoirs, aqueducts, tunnels, and power plants that extend more than 705 miles, and it is operated by DWR. Figure 3-2 shows SWP facilities.

SWP contract supplies total up to 4.2 MAF for all 29 agencies, with up to 1,911,500 AF for Metropolitan pursuant to its State Water Contract. DWR annually allocates contract supplies, known as Table A amounts, considering several factors, including hydrologic conditions, Delta water quality and flow requirements, regulations to protect fish, and agency demands. SWP water supply estimates used in this UWMP are based on DWR's draft 2025 SWP Delivery Capability Report, as described in Chapter 2.3

Background

Endangered Species Act Permits

The listing of several fish species as threatened or endangered under the federal or California Endangered Species Acts (respectively, the "Federal ESA" and the "California ESA" and, collectively, the "ESAs") has adversely impacted operations and limited the flexibility of the SWP. Currently, six species (the winter-run and spring-run Chinook salmon, Delta smelt, longfin smelt, North American green sturgeon, and Central Valley steelhead) are listed under the ESAs. In addition, on June 19, 2024, the California Fish and Game Commission voted to approve the white sturgeon as a candidate species under the California ESA. Because of the listing of the various species, the federal Central Valley Project (CVP) and SWP are prohibited from "taking" the fish in their operations and must consult with federal fisheries agencies to determine whether their operations will jeopardize the existence of the species. If so, CVP and SWP must establish reasonable and prudent alternatives (RPAs) to normal project operations to minimize their impacts on the smelt and salmon.

In 2004 and 2005, the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) issued biological opinions and incidental take statements that governed operations of the SWP and the CVP with respect to the Delta smelt, the winter-run and spring-run Chinook salmon, and the Central Valley steelhead. In July 2006, USBR reinitiated consultation with USFWS and NMFS with respect to the 2004 and 2005 biological opinions (with the addition of the North American green sturgeon, which was listed in April 2006) following the filing of legal challenges to those biological opinions and incidental take statements.

Figure 3-2
State Water Project Facilities



In 2008, USFWS issued a Biological Opinion with RPAs including criteria for operation of the CVP and SWP in a manner not likely to jeopardize the continued existence of the Delta smelt or adversely modify designated critical habitat. NMFS made a similar finding with respect to project operation effects on the listed salmon and steelhead in its revised Biological Opinion in 2009. Coordinated CVP/SWP operations were required to incorporate RPAs suggested by the agencies in the 2008 and 2009 Biological Opinions to ensure they are exempt from the otherwise applicable prohibition on “take” of Federal ESA-listed species.

To comply with the California ESA, DWR obtained consistency determinations for species listed under both ESAs and a separate Fish & Game Code Section 2081 Incidental Take Permit that authorized the incidental take of the state-listed Longfin smelt from SWP operations.

Biological Opinions and Incidental Take Permit for State Water Project

In September 2021, USBR and DWR reinitiated consultation with NMFS and USFWS on the Coordinated Long-term Operations of the CVP and SWP due to anticipated modifications to the proposed action that may cause effects to ESA-listed species and/or designated critical habitat not analyzed in the 2019 biological opinions. In late 2024, the U.S. Fish and Wildlife Service (FWS) and National Marine Fisheries Service (NMFS) issued new Biological Opinions for the Long-Term Operation of the Central Valley Project (CVP) and State Water Project (SWP). Additionally, in late 2024, the California Department of Fish and Wildlife (DFW) issued to DWR a new Incidental Take Permit for the Long-Term Operation of the SWP pursuant to the California Endangered Species Act (CESA) with regard to state-protected white sturgeon and state- and federally-protected delta smelt, longfin smelt, winter-run Chinook and spring-run Chinook. The operational restrictions in the federal 2024 Biological Opinions and the state Incidental Take Permit were consistent in 2024. In December 2025, the Bureau of Reclamation issued a revised Record of Decision (ROD) that adopted modified operational requirements for the CVP, called “Action 5.” Some of the operational restrictions in Action 5 differ from those in the 2024 state Incidental Take Permit for the SWP.

In 2025, DWR received two state Incidental Take Permit amendments to its 2024 state permit, but there continues to be some misalignment between state and federal operation plans. DWR and Reclamation are committed to minimizing potential misalignments and relying on existing mechanisms for accounting under the state and federal Coordinated Operations Agreement (COA) to minimize any redirected water supply impacts.

Currently, there is no litigation challenging the 2024 biological opinions or the modification to the ROD that adopted Action 5 for CVP operations. Certain federal water contractors filed litigation challenging the state's Incidental Take Permit. The previous legal challenges to the 2019 biological opinions have been dismissed.

Water Quality Control Plan / Healthy Rivers and Landscapes/Voluntary Agreements

The SWRCB is responsible for adopting and updating the Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary (Bay-Delta Plan), which establishes water quality control objectives and flow requirements needed to provide

reasonable protection of beneficial uses in the watershed. The SWRCB has been engaged for many years in updating the Bay-Delta Plan.

The Bay-Delta Plan is being updated through phases. Phase 1 updated the Bay-Delta Plan objectives for the San Joaquin River and its major tributaries and the southern Delta salinity objectives. Phase 2 is updating the objectives for the Sacramento River and Delta and their major tributaries (Plan amendments). On December 12, 2018, through State Water Board Resolution No. 2018-0059, the State Water Board adopted the Phase 1 Plan amendments and Final SED establishing the Lower San Joaquin River flow objectives and revised southern Delta salinity objectives. On February 25, 2019, the Office of Administrative Law approved the Plan amendments. This plan requires an adaptive range of 30-50 percent of the unimpaired flow to be maintained from February through June in the Stanislaus, Tuolumne, and Merced Rivers, with a starting point of 40 percent of the unimpaired flow. During this same time period, the flows at Vernalis on the San Joaquin River, as provided by the unimpaired flow objective, are required to be no lower than a base flow of 1,000 cubic feet per second (cfs), with an adaptive range between 800 and 1,200 cfs, inclusive. The plan also updated the South Delta salinity standards for protecting agricultural beneficial uses. While this part of the plan was updated, there is ongoing litigation challenging the updated plan and has not yet been implemented.

The SWRCB is also considering Phase 2 Plan amendments focused on the Sacramento River and its tributaries, Delta eastside tributaries (including the Calaveras, Cosumnes, and Mokelumne rivers), Delta outflows, and interior Delta flows. Staff is recommending an adaptive range of 45-65 percent unimpaired flow objective with a starting point of 55 percent. Once the SWRCB adopts Phase 2 Plan amendments, it will assign implementation responsibility in both Phases 1 and 2. At this time, the potential impacts to the SWP are unknown, but this implementation approach would have a large impact on water users, including SWP public water agencies, in the Phase 2 planning area.

In 2018, the State and several water users proposed an alternative to the SWRCB staff's recommendation for the Phase 2 Bay-Delta Plan update, known as the Program for Implementing Healthy Rivers and Landscapes (HRL), previously referred to as Voluntary Agreements. The HRL offers an addition to the State Water Board staff's flow-only approach. The HRL, if agreed to by the SWRCB, would be concurrently implemented with the unimpaired flow approach (for non-HRL participants) and would become the Program of Implementation for the Plan amendments. SWRCB staff included the HRL as an alternative in their draft Program of Implementation. The HRL will be implemented through enforcement agreements. The HRL includes flow commitments and funding for flow commitments, habitat actions, and a robust science program. The HRL provides an opportunity to combine flow and habitat actions to protect fish and wildlife beneficial uses of water, while providing certainty for water users. It also offers a chance to avoid years of hearings and litigation and to instead begin implementation of the updated Bay-Delta Water Quality Control Plan upon adoption by the SWRCB.

If the HRL is adopted by the SWRCB, one of the key operational requirements for spring outflow in the 2024 SWP Incidental Take Permit will be replaced and aligned with the flow commitments in the HRL. DWR's draft 2025 State Water Project Delivery Capability Report assumes that this alignment would occur and, as a result, reflects minor improvements in modeled State Water Project allocations compared to the 2023 Delivery Capability Report.

Changed Conditions

In October 2025, DWR released the draft 2025 State Water Project Delivery Capability Report (DCR). Please see Chapter 2.3 for a description of the 2025 DCR, which is used for estimated SWP supply capability in the UWMP Water Reliability Assessment.

The SWP facilities including the California Aqueduct were designed to account for residual natural subsidence in the San Joaquin Valley. However, as noted in the State Water Project Delivery Capability Report 2023 Addendum—Impacts of Subsidence (DCR Subsidence Addendum) released by DWR in May 2025, the overdesign capacity of the Aqueduct to account for subsidence has been exhausted because of historical and ongoing natural and human-induced subsidence. DWR has implemented operating criteria to minimize impacts on the delivery capability because of the reductions in conveyance capacity resulting from subsidence. The DCR Subsidence Addendum modeling indicates that even with these adaptations, 2023 levels of subsidence reduce the long-term average delivery capability of the SWP by three percent. Without arresting and preventing ongoing subsidence and implementing infrastructure improvements, the report estimates that the long-term average delivery capability of the SWP could be reduced by 18 percent to 87 percent by 2043, assuming current subsidence trends continue into the future. The estimates of delivery capability presented in the DCR Subsidence Addendum contain a high degree of uncertainty associated with the subsidence trends given the actions related to the Sustainable Groundwater Management Act in the vicinity of the California Aqueduct, and DWR is implementing additional studies to improve understanding of this uncertainty.

More importantly, DWR is currently working to implement infrastructure improvement projects to avoid the near-term reductions in the delivery capability forecasted for 2043. The projects include Check 17 Gate Removal, Pools 17-18 Liner Raise, Pools 20-21 Liner Raise, Pool 24 Liner Raise, and Pool 31 Liner Raise. These projects collectively will raise 42 miles of concrete liner at critically subsided locations along the California Aqueduct to prevent water supply reductions forecasted for 2043. These near-term projects have been prioritized to begin construction between 2026 and 2028 to maximize the risk reduction. With these improvement projects implemented, DWR expects the risk to the delivery capability forecasted in the DCR Subsidence Addendum will be significantly reduced. Concurrently, DWR is also in the planning phases of implementing long-term improvements to restore the original design conveyance capacity and original operating criteria of the Aqueduct through 2085. Accordingly, DWR has recommended using the 2025 Draft DCR to support long-term planning efforts and not the DCR Subsidence Addendum. Metropolitan supports efforts to curb subsidence and will incorporate results of modeling in the future, if needed.

Golden mussels (*Limnoperna fortunei*) were discovered in the Sacramento-San Joaquin Delta in October 2024 and are rapidly spreading through the SWP. If unmanaged, invasive mussel infestations have been known to severely impact the aquatic ecology of lakes and rivers; clog intakes and raw water conveyance systems; reduce the recreational and aesthetic value of lakes and beaches; alter or destroy fish habitats; and render lakes more susceptible to deleterious algae blooms. For further discussion on invasive mussels impacting both the SWP and CRA systems, please see “Invasive Mussels” under “Changed Conditions” in Section 3.1.

Implementation Approach

Metropolitan's implementation approach for the SWP depends on the full use of the current State Water Contract provisions, including its basic contractual amounts and Article 21 interruptible supplies. This approach requires actions to preserve water supply reliability, water quality, and conveyance system reliability. Metropolitan is committed to working collaboratively with DWR, SWP contractors, and other stakeholders to ensure the continued reliability of the SWP.

SWP Reliability

This discussion provides details of major actions being undertaken to improve SWP reliability.

Delta Conveyance Project

Planning for a Delta conveyance project to address declining populations of sensitive fish species and the increasingly restrictive permit conditions began decades ago. In the mid-1990s, a consortium of federal, state, and local agencies, including Metropolitan, entered the Bay-Delta Accord, which included hundreds of millions of dollars for ecosystem restoration in the Delta and its salmon-bearing tributaries. In 2000, a similar consortium completed the CALFED analysis of a program of ecosystem restoration and improvements to Delta conveyance and issued a Record of Decision that included dual conveyance as an alternative. In April 2006, the CALFED Program issued a 10-year Action Plan to refocus the program based on new scientific and policy information. The scientific information indicated that the current physical configuration of the Delta did not lead to a sustainable condition due to increasing risk of seismic events and sea level rise; and that population levels for Delta pelagic (open water) organisms were at record low levels and were appearing to continue to decline.

The 10-year Action Plan also indicated that several water users were considering the development of a habitat conservation plan for the Delta. This effort was the initiation of the Bay Delta Conservation Plan (BDCP), which began with the support and participation of water suppliers, including Metropolitan. One of the conservation measures included new points of diversion on the Sacramento River in the north Delta connected by a canal or two tunnels to Clifton Court Forebay (part of the SWP) in the south Delta.

In September 2006, Governor Schwarzenegger signed Executive Order S-17-06, which launched the Delta Vision process by establishing a Blue-Ribbon Task Force, a cabinet-level Delta Vision Committee, Delta Science Advisors, and a Stakeholder Coordination Group. The executive order charged the Blue-Ribbon Task Force with developing both a long-term vision for a sustainable Delta and a plan to implement that vision. The Delta Vision Committee recommended, among other things, the creation of a state plan for the Delta and Suisun Marsh aimed at landscape-scale ecosystem restoration and a new Delta conveyance infrastructure to create a dual system of conveyance. On February 28, 2008, Governor Schwarzenegger, in a letter to state Senators Perata, Machado, and Steinberg, stated his intention to direct DWR to proceed with preparation of environmental review and permitting activities for the BDCP.

In 2009, in light of the Delta Vision reports and recommendations, the Legislature enacted the Sacramento-San Joaquin Delta Reform Act of 2009, which established the coequal

goals for the Delta of ecosystem restoration and restoration of reliable SWP and CVP supplies, created the Delta Stewardship Council, and charged the new agency with development of a Delta Plan to further the coequal goals in a manner that protects and enhances the Delta as an evolving place. The Delta Reform Act and the first Delta Plan, adopted in 2013, called for incorporation of the BDCP into the Delta Plan if it met state and federal requirements for a habitat conservation plan and natural communities' conservation plan.

The BDCP planning process continued under Governor Brown, but in light of comments on the BDCP, DWR began analyzing three new sub-alternatives to the BDCP that involved new conveyance independent of any landscape-scale habitat restoration called the California WaterFix. At the same time, Governor Brown initiated California EcoRestore, which was aimed at restoration of 30,000 acres of fish habitat in the Delta. In July 2017, DWR approved California WaterFix. Metropolitan's Board authorized participation in California WaterFix in October 2017, and again in April and July of 2018.

In his State of the State address delivered February 12, 2019, Governor Newsom announced that he did not "support WaterFix as currently configured," but does "support a single tunnel." On April 29, 2019, Governor Newsom issued Executive Order N-10-19, directing several agencies to (among other things) "inventory and assess… [c]urrent planning to modernize conveyance through the Bay Delta with a new single tunnel project."

Consistent with Executive Order N-10-19, in early 2019, the state announced a new single tunnel project, which proposed a set of new diversion intakes along the Sacramento River in the north Delta for the SWP. In 2019, DWR initiated planning and environmental review for a single-tunnel Delta Conveyance Project (DCP) to protect the reliability of SWP supplies from the effects of climate change and seismic events, among other risks. On December 21, 2023, DWR certified the Environmental Impact Report and approved the DCP selecting "Bethany Reservoir Alignment" for further engineering, design, and permitting. DWR received the Incidental Take Permit for the DCP from the California Department of Fish and Wildlife in February 2025. DWR is in the process of obtaining a change in point of diversion permit from the State Water Resources Control Board to add the two proposed DCP diversion intakes to the SWP water rights. In October 2025, DWR certified that DCP is consistent with the Delta Plan. DWR is continuing with the design refinements, environmental planning and permitting through 2026-27, including resolving appeals on its Delta Plan certification. DCP will potentially be operational in 2045 following extensive planning, permitting, and construction.

DWR's estimates of SWP supply reliability in its draft 2025 Delivery Capability Report are based on existing facilities and do not include the proposed DCP, which faces ongoing litigation and financing uncertainty. Since this UWMP uses DWR's draft 2025 Delivery Capability Report to estimate SWP supplies at 2045, any changes in SWP supply reliability that would result from the proposed DCP are not included in this UWMP. Most recent estimates from DWR indicate that DCP is expected to increase SWP Delta exports by about 467,000 acre-feet per year on a long-term average under current climate conditions.

At its December 10, 2024, Board meeting, Metropolitan's Board authorized the General Manager to enter into an amended agreement for preconstruction work planned for 2026-2027. Metropolitan's commitment level for this tranche of funding totals $141.6 million,

equivalent to a participation level of 47.2 percent. Metropolitan's action to approve an amendment to the 2020 funding agreement to fund planning and preconstruction costs for 2026-2027 does not commit Metropolitan to participate in the Delta Conveyance Project. Any final decision to commit to the Delta Conveyance Project and incur final design and construction costs would require further Board approval, which is currently anticipated in 2027, after key permits are obtained, which is anticipated by end of 2026.

B. F. Sisk Dam Raise and San Luis Reservoir Expansion

USBR and the San Luis & Delta-Mendota Water Authority are proposing to raise B. F. Sisk Dam and expand storage capacity at San Luis Reservoir. In addition to the ongoing 12-foot dam raise being implemented to address dam safety requirements, the proposed project would raise the dam an additional ten feet and increase San Luis Reservoir storage capacity by approximately 130 TAF.

The Final Environmental Impact Report and Record of Decision for the project were issued in October 2023. Under the preferred alternative evaluated in the environmental review, SWP exports could be reduced by approximately 23 TAF per year on a long-term average basis. The project is currently undergoing design, environmental planning, and permitting.

Estimates of SWP supply reliability in DWR's draft 2025 SWP Delivery Capability Report are based on existing facilities and do not include the proposed B. F. Sisk Dam raise and San Luis Reservoir expansion. Accordingly, any changes in SWP supply reliability associated with this project are not reflected in this UWMP.

Sites Reservoir

Sites Reservoir is a proposed off-stream surface storage reservoir in northern California, located west of the Sacramento River near the community of Maxwell. The project would have an approximate storage capacity of 1.5 million acre-feet. Sacramento River flows would be diverted during periods of excess flow and stored in the off-stream reservoir for release during drier periods. Sites Reservoir is intended to provide water supply, environmental production, flood management, and recreational benefits.

The proponents of Sites Reservoir include approximately 30 entities, including several individual State Water Project (SWP) public water agencies. Based on the Sites Reservoir Final Environmental Impact Report / Environmental Impact Statement, Sites Reservoir is expected to provide approximately 205 thousand acre-feet per year of additional deliveries, on average, to participating agencies under existing conditions. Sites Reservoir is currently undergoing environmental planning and permitting. The project has filed a water rights petition and is anticipated to receive a water right permit from the SWRCB in 2026.

Estimates of SWP supply reliability in the Department of Water Resources' draft 2025 SWP Delivery Capability Report are based on existing facilities and do not include the proposed Sites Reservoir project. Accordingly, any potential changes in SWP supply reliability associated with Sites Reservoir are not reflected in this UWMP.

Metropolitan and other public agencies are currently in evaluation whether and to what extent they will participate in funding and receiving benefits from Sites Reservoir.

Contract Amendments

Metropolitan and other State Water Contractors have undertaken negotiations with DWR to extend their State Water Contracts. In June 2014, DWR and the State Water Contractors reached an Agreement in Principle on an amendment to the State Water Contracts to extend the contracts and to make certain changes related to financial management of the SWP in the future. DWR and 25 of the State Water Contractors, including Metropolitan, have signed the Agreement in Principle. Under the Agreement in Principle, the term of the State Water Contract for each Contractor that signs an amendment would be extended until December 31, 2085. The Agreement in Principle served as the "proposed project" for purposes of environmental review under CEQA. DWR issued a Notice of Availability of the Draft Environmental Impact Report (EIR) for the proposed project on August 17, 2016. DWR released the Final EIR on November 16, 2018, and certified the final EIR and issued a Notice of Determination on December 11, 2018. Concurrently, Metropolitan considered the certified final EIR and approved the water supply contract extension amendment at its December 11, 2018, Board meeting. That same day, DWR filed a lawsuit seeking to validate the contract extension. In January of 2019, two groups of plaintiffs filed lawsuits challenging DWR's Final EIR and approval of the Contract Extension under CEQA, the Delta Reform Act, and the public trust doctrine. The Amendment became effective on January 1, 2023, for the SWP contractors that signed the Amendment and a litigation waiver agreement with DWR. On April 17, 2024, the California Supreme Court denied all petitions seeking review of the decision issued on January 5, 2024, by the Third District Court of Appeal, which affirmed the validity of the SWP Contract Extension Amendment. As a result, all litigation challenging the Amendment has been concluded. Among other things, the Amendment extends the SWP contract term to 2085 and makes certain changes to financial provisions aimed at maintaining and improving the SWP's fiscal integrity and management. DWR has implemented these changes including, most notably, a new pay-go system that should make the billing and accounting process for SWP costs much simpler and more transparent.

In a process separate from the State Water Contract extension amendment described above, Metropolitan and other State Water Contractors undertook public negotiations with DWR to amend their State Water Contracts to clarify how costs would be allocated for the California WaterFix, as well as to clarify the criteria applicable to certain water management tools including single and multi-year water transfers and exchanges between State Water Contractors. DWR and the State Water Contractors reached an Agreement in Principle (AIP) in 2018, and DWR issued a Draft EIR. On April 29, 2019, Governor Newsom issued the executive order directing State agencies to develop a comprehensive statewide strategy to build a climate-resilient water system that included consideration of a single-tunnel Delta conveyance facility instead of the approved California WaterFix project. DWR removed the WaterFix cost provisions from the 2018 AIP and, on February 28, 2020, recirculated the Draft EIR for only the 2018 AIP's water management provisions. DWR certified a Final EIR for the water management tools AIP in August 2020 and finalized contract language in October 2020. Since then, all but three of the SWP contractors have approved and signed the amendments, including Metropolitan, which approved the amendments on February 9, 2021. As a result, the amendments became effective on February 28, 2021. The water management provisions allow for greater flexibility for transfers and exchanges among those public agencies with State Water Contracts.

Specifically, it would confirm existing practices for exchanges, allow more flexibility for non-permanent water transfers, and allow for the transfer and exchange of certain portions of Article 56 carryover water.

In light of the shift from California WaterFix to the Delta Conveyance Project, Metropolitan and other State Water Contractors embarked on a third public process to further negotiate proposed amendments related to cost allocation for a potential new Delta Conveyance Project. In March of 2021, DWR and the State Water Contractors reached an Agreement in Principle for the allocation of costs and benefits for a Delta Conveyance project based on an allocation of proportionate shares. The Delta Conveyance AIP provides a mechanism that would allow for the costs related to any Delta Conveyance project to be allocated for and collected by DWR. The Delta Conveyance AIP also provides for the allocation of benefits for any Delta Conveyance project. Additionally, the Delta Conveyance AIP includes a white paper that describes how DWR would account for and administer any Delta Conveyance project benefits and costs if a project were implemented today. Final contract language remains under development.

Coordinated Operating Agreement (COA) and Addendum

The Coordinated Operation Agreement (COA) was originally signed in 1986 and defines how the SWP and CVP share the available water supply and the obligations including senior water right demands, water quality, and environmental flow requirements imposed by regulatory agencies. The agreement calls for periodic review to determine whether updates are needed in light of changed conditions. After completing a joint review process, DWR and USBR agreed to an addendum to the COA in December 2018, to reflect water quality regulations, biological opinions, and hydrology updated since the agreement was signed.

The COA Addendum included changes to the percentages for sharing responsibilities for in-basin uses, sharing available export capacity, and the periodic review process. The 1986 Agreement required CVP to meet 75 percent of the Sacramento Valley in-basin uses and the SWP to meet 25 percent. The COA Addendum now distinguishes responsibility based on water year type, and CVP responsibilities range from 80 percent in wet years to 60 percent in critical years. SWP responsibility ranges from 20 percent in wet years to 40 percent in critical years. Additionally, the COA Addendum changed sharing of export capacity. Previously, export capacity was shared 50 percent to CVP and 50 percent to SWP. The COA addendum changed this formula to be 65 percent CVP and 35 percent SWP during balanced conditions in the Delta and 60 percent CVP and 40 percent SWP during excess conditions. Overall, based on modeling, these changes result in an approximately 115,000 AFY on average reduction in long-term SWP supplies.

Finally, the 2018 COA Addendum updated the periodic review process to require review of the COA Agreement and Addendum every five years.

Ecosystem Restoration

The main objective under the EcoRestore Program was the restoration of at least 30,000 acres of Delta habitat, with the near-term goal of making significant strides toward that objective by 2020. DWR's restoration efforts in the Delta continue under the Delta Habitat Restoration program. To date, 14,300 acres of habitat in the Delta have been

restored, with another 20,200 acres under construction and 6,900 acres in the planning process. These restoration programs include projects and actions that comply with pre-existing regulatory requirements designed to improve the overall health of the Delta. Other priority restoration projects would also be identified by the Sacramento-San Joaquin Delta Conservancy and other agencies and local governments. Funding is provided through multiple sources, including various local and federal partners, state bonds, and other state-mandated funds. SWP/CVP contractors have provided funds as part of existing regulatory obligations imposed on the SWP and CVP.

Delta Science Initiatives

Metropolitan's Bay-Delta science program supports water supply reliability and ecosystem restoration by protecting the Bay-Delta environment, driving better management decisions, and fostering effective regulations. Metropolitan is conducting a science program to ensure that regulations effectively protect aquatic species while ensuring a reliable water supply. The key elements of the science program include: (1) staff with scientific expertise to design, manage, and participate in scientific investigations addressing Metropolitan's priorities; (2) funding science studies through direct funding, collaborations, staff in-kind contributions, and by pursuing external grant funding sources to leverage Metropolitan's science investments; (3) collaborations with external organizations to conduct science studies, including the State Water Contractors, Collaborative Science and Adaptive Management Program (CSAMP), Interagency Ecological Program agencies, Delta Stewardship Council Delta Science Program, and university scientists; and (4) participation in the Bay-Delta science community through communication of science study findings, participation in science conferences, and publishing results of scientific studies in peer reviewed journals.

Metropolitan's Bay-Delta science efforts focus on three priority areas: (1) water operations to protect Delta fish, (2) Delta stressors and (3) habitat needs of listed fish species.

- Water Operations to Protect Delta Fish – A priority focus for the science program is to develop a better understanding of the effect of water project operations on the health, abundance, and distribution of listed fish species, including Delta smelt, longfin smelt, and Chinook salmon. The science program includes investigation of the mechanisms behind flow-abundance relationships observed in analysis of fish survey data for Delta smelt and longfin smelt, factors that affect adult Delta smelt, salmon and steelhead entrainment risk at the CVP and SWP export facilities, potential bias in fish survey data, and development of effective methods to study Delta smelt without collecting or harming the fish.
- Delta Stressors – Multiple stressors in the Bay-Delta ecosystem affect the health, abundance, and distribution of listed fish species; however, we have limited understanding of the impacts of various stressors and their specific role in the decline of listed species. The science program includes investigation into key stressors to develop information that can support development of effective management actions. These studies include investigation into predation impacts on salmon, toxic contaminant effects on Delta smelt and juvenile salmon, and the effects of nutrients on the food web.

- Habitat Needs for Delta Fish – Compared to the historical Delta, the modern Delta is highly altered and has a small fraction of tidal marsh habitat remaining and greatly reduced levels of primary production. Food and habitat limitation have been identified as important stressors for listed species. The science program includes investigation of salmon habitat needs, pilot studies to enhance the food web, longfin smelt habitat studies, pilot projects to benefit Delta smelt, monitoring the effectiveness of habitat improvement actions, and evaluation of land use and habitat opportunities on Metropolitan's Delta Island properties.

SWP Terminal Storage

Metropolitan has contractual rights to 65 TAF of flexible storage at Lake Perris (East Branch terminal reservoir) and 154 TAF of flexible storage at Castaic Lake (West Branch terminal reservoir). This storage is SWP supply that Metropolitan can borrow in addition to allocated Table A amounts.

Yuba Dry-Year Water Purchase Program

In December 2007, Metropolitan entered into an agreement with DWR providing for Metropolitan's participation in the Yuba Dry-Year Water Purchase Program between Yuba County Water Agency and DWR. This program provided for transfers of water from the Yuba County Water Agency during dry years through 2025. Metropolitan engaged in negotiations with DWR, Yuba County Water Agency, and other participating contractors to extend the Yuba Accord long-term transfer program through 2050.

Desert Water Agency/Coachella Valley Water District SWP Table A Transfer

Under the transfer agreement, Metropolitan transferred 100 TAF of its SWP Table A contractual amount to Desert Water Agency/Coachella Valley Water District (DWCV). Under the terms of the agreement, DWCV pays all SWP charges for this water, including capital costs associated with capacity in the California Aqueduct to transport this water to Perris Reservoir, as well as the associated variable costs. The amount of water actually delivered in any given year depends on that year's SWP allocation. Water is delivered through the existing exchange agreements between Metropolitan and DWCV, under which Metropolitan delivers Colorado River supplies to DWCV equal to the SWP supplies delivered to Metropolitan. While Metropolitan transferred 100 TAF of its Table A amount, it retained other rights, including interruptible water service; its full carryover amounts in San Luis Reservoir; its full use of flexible storage in Castaic and Perris Reservoirs; and any rate management credits associated with the 100 TAF.

DWCV Exchange and Advance Delivery Program

Under this program, Metropolitan delivers Colorado River water to the Desert Water Agency (DWA) and Coachella Valley Water District (CVWD) in advance of the exchange for their SWP Contract Table A allocations. In addition to their Table A supplies, DWA and CVWD may take delivery of other SWP supplies available to SWP Contractors. By delivering enough water in advance to cover Metropolitan's future exchange obligations, Metropolitan is able to receive DWA's and CVWD's available SWP supplies without having to deliver an equivalent amount of Colorado River water. This program allows Metropolitan to maximize delivery of SWP water in wet years by enabling delivery of Colorado River supplies to storage in the Advance Delivery Program instead of to the service area. These

Table A deliveries are incorporated into the estimate of SWP Deliveries under Current Programs shown in Table 3-2.

DWCV Other SWP Deliveries

Since 2008, Metropolitan has provided DWA and CVWD written consent to take delivery of non-SWP supplies separately acquired by each agency from the SWP facilities. These deliveries include water acquired from the Yuba Dry-Year Water Purchase Program, the Multi-Year Water Pool, the 2009 Drought Water Bank, and long-term water supplies purchased by CVWD from Rosedale Rio-Bravo Water Storage District. Metropolitan has also consented to:

- 10 TAF of exchange deliveries to CVWD for non-SWP water acquired from the San Joaquin Valley from 2008 through 2010,
- 36 TAF of exchange deliveries to DWA for non-SWP water acquired from the San Joaquin Valley from 2008 through 2015, and
- 16.5 TAF of exchange deliveries to CVWD from groundwater storage of Kern River flood flows or SWP water delivered from Kern County Water Agency provided by Rosedale Rio-Bravo Water Storage District from 2012 through 2035.

In 2019, Metropolitan, DWA and CVWD executed an amendment to the Advance Delivery Program and exchange of water. Among its provisions is the termination of Metropolitan's right to an annual option to call-back the 100,000 acre-feet Table A transfer. It also provides that Metropolitan will deliver Article 21 and non-SWP water supplies for DWA and CVWD to the extent that Metropolitan has available capacity. This agreement also includes an additional exchange of 15 TAF per year from 2020 to 2026. However, as the source of the exchange is water, CVWD can call from the ID/MWD Conservation Program, which is Colorado River water. This exchange is discussed in more detail in the IID/MWD Conservation Program section.

Table 3-2 summarizes Metropolitan's SWP supply range for 2040. Appendix 3 provides a detailed discussion of the current SWP programs and programs that are under development.

Table 3-2
California Aqueduct Program Capabilities
Calendar Year 2040
(acre-feet per year)

Hydrology	Five-Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
MWD Table A[1]	301,000	39,000	885,000
DWCV Table A	48,000	6,000	140,000
San Luis Carryover[2]	59,000	286,000	286,000
Article 21 Supplies	0	0	16,000
Yuba River Accord Purchase	13,400	14,000	8,000
Subtotal of Current Programs	***421,400***	***345,000***	***1,335,000***
Programs Under Development			
Subtotal of Proposed Programs	***0***	***0***	***0***
Maximum Supply Capability	**421,400**	**345,000**	**1,335,000**

Notes:
1. Includes Port Hueneme lease.
2. Includes DWCV carryover.

SWP Water Quality

Metropolitan requires a safe drinking water supply from the Bay-Delta to meet current and future regulatory requirements for public health protection. Finding cost-effective ways to reduce total organic carbon (TOC), bromide concentrations, pathogenic microbes, and other unknown contaminants from the Bay-Delta water supply is one of Metropolitan's top priorities. Metropolitan also requires a SWP supply that is consistently low in salinity—Total Dissolved Solids (TDS)—so it can blend SWP water with higher-salinity Colorado River water to achieve salinity goals for its member agencies. In addition, Metropolitan needs consistently low-salinity SWP water to increase in-basin water recycling and groundwater management programs. These programs require that blended water supplied to the member agencies meets the TDS goal adopted by Metropolitan's Board, which specifies a salinity objective of 500 mg/L for blended imported water.

Metropolitan continues to support and participate in DWR's Municipal Water Quality Investigations (MWQI) Program. The highly variable quality of SWP water influences the operation of Metropolitan's system and its water treatment process. Increasingly restrictive State and Federal drinking water standards, concerns over emerging contaminants such as personal care products and pharmaceuticals, algal taste and odors, and Delta ecosystem fisheries issues are critical variables. DWR's MWQI Program strives to monitor, protect, and improve the drinking water quality of Delta water deliveries to the urban State Water Contractors and other users of Delta water. The program focuses on issues related to drinking water quality through regular water quality monitoring, special field and laboratory studies, the use of forecasting tools such as computer models and data management

systems, and reporting. While the program has developed extensive monitoring in the Delta including real-time monitoring, increased monitoring along the California Aqueduct is the next major step.

Levee modifications at Franks Tract and other source control actions may significantly reduce ocean salinity concentrations in Delta water, which would benefit Delta water users and export interests alike. Franks Tract is an island located in the central Delta that was actively farmed until levee breaches in 1936 and 1938. Since 1938, the tract has remained a flooded island, and its levees remain in disrepair. Tidal flows in the Delta entrap saline ocean water in the flooded tract, resulting in degraded water quality for both in-Delta and export users. Computer modeling analyses by Metropolitan, DWR, and the U.S. Geological Survey indicate that reducing this salinity intrusion by partially closing existing levee breach openings and/or building radial gate flow control structures will significantly reduce TDS and bromide concentrations in water from the Delta during the summer and fall months and in drought years.

In 2016, the California Department of Fish and Wildlife (CDFW), as part of the 2016 Delta Smelt Resiliency Strategy, began a process of working with the local community, local agencies, and interested stakeholders in developing a habitat enhancement plan for Franks Tract called the Franks Tract Restoration Feasibility Study. The objective was to assess the feasibility of restoring components of the historic tidal marsh form and function to create habitat suitable for Delta Smelt, reduce the extent of aquatic weeds, decrease predation on Delta Smelt and other native fishes by lowering habitat suitability for non-native species, modify hydrology to something more similar to historical conditions, improve food webs, and improve water quality in the interior Delta, which would benefit both in-Delta diverters and SWP and CVP supplies. In its current state of shallow open water, Franks Tract facilitates salinity intrusion into the mid-Delta as a result of tidal pumping through False River. Restoration designs focus on minimizing tidal pumping from False River.

The state has adopted an equivalent level of public health protection program that targets water quality actions outside the Delta. The Bay-Delta Program is coordinating a feasibility study on water quality improvement in the California Aqueduct.

Metropolitan and the Friant Water Users Authority (FWUA) have entered into a partnership to investigate the potential of enhancing the quantity and affordability of the eastern San Joaquin Valley's water supply while improving Southern California's water quality. The FWUA and Metropolitan studied projects that benefited both regions. Using Proposition 13 funds, an existing canal belonging to the Arvin-Edison Water Storage District was enlarged, enabling greater volumes of water to be exchanged between their groundwater and the California Aqueduct.

SWP System Outage and Capacity Constraints

Subsidence has been observed in the San Joaquin Valley since the 1920s, and subsidence was included in the planning and design of the California Aqueduct. However, subsidence levels much higher than baseline have been occurring in several areas along the California Aqueduct, specifically at the portion of the aqueduct named San Luis Canal that is shared with USBR for use by the Central Valley Project contractors. DWR published two detailed studies in 2017 and 2019 describing the impacts of subsidence in the reduction of concrete liner freeboard and the ability to store water in certain pools, reducing operational flexibility

and increasing power costs. Due to the implementation of special operational conditions that reduced the required freeboard from three feet to one foot, as well as operating two separate pools in the aqueduct as one long one, deliveries continue to both the Coastal Branch serving SWP and the Coalinga Canal, serving CVP contractors. Without those modifications, deliveries would be constrained.

In 2015, Metropolitan, DWR, and the Los Angeles Department of Water and Power formed the Seismic Resilience Water Supply Task Force (SRWSTF). The goal of the SRWSTF is to collaborate on studies and mitigation measures aimed at improving the reliability of imported water supplies to Southern California. The SRWSTF aims to identify options to accelerate initial repairs acting as one agency and establish consensus on regional priorities for aqueduct repairs. The SRWSTF also conducts emergency exercises to test the response plan and identify potential areas for improved coordination.

Because of the risk of a prolonged shutdown of the SWP caused by seismic or hydrologic events either within the Delta or along the California Aqueduct, Metropolitan has acted to ensure that Southern California has adequate emergency storage. Diamond Valley Lake and SWP terminal reservoir storage, combined with member-agency emergency storage, are jointly capable of providing the region with a six-month supply of water if combined with a temporary 25 percent reduction in demand. Metropolitan engineering studies indicate this would provide sufficient time to repair the SWP and resume delivery.

DWR is investing to reduce the seismic and hydrologic risk of aging SWP infrastructure critical in Southern California. A major retrofit to Perris Dam in Riverside County was completed in April 2018, and DWR has also improved the Perris outlet tower and is currently working on a project to improve the emergency release system around Lake Perris, the terminal reservoir of the East Branch of the California Aqueduct. Currently, both Pyramid Dam and Castaic Dam have modernization programs aimed to improve seismic resilience, addressing not only the dams but also appurtenances near and around the dams.

Invasive Mussel Control Program

Metropolitan is implementing control measures for quagga mussels and golden mussels. For more information, please see “Invasive Mussel Control Program” under “Implementation Approach” in Section 3.1.

Achievements to Date

SWP Water Quality

The most significant achievement for SWP water quality has been continued definition and advancement of the Delta Improvement Package. Most notably, the Franks Tract studies identified cost-effective ways to achieve significant improvements in the quality of Delta export water.

SWP System Reliability

The completion of Diamond Valley Lake (DVL) marked the most important achievement with respect to increasing storage within Metropolitan’s service area. It was filled for the first time in 2003. The lake can hold up to 810 TAF of SWP water delivered via the Inland Feeder which is used for current-year operations and dry-year storage.

Inland Feeder

The Inland Feeder is a 44-mile-long conveyance system completed in 2009 that connects DWR's Devil Canyon facility to DVL and the CRA. The Inland Feeder provides greater flexibility in managing Metropolitan's major water supplies and allows up to 1,000 cfs of SWP water to be moved for storage in DVL.

Inland Feeder-Lakeview Pipeline Intertie

The Inland Feeder-Lakeview Pipeline Intertie connects the two conveyance pipelines at the PC-1 control structure on the Inland Feeder. The project allows for delivery of water from Diamond Valley Lake to the Mills Water Treatment Plant, using DWR's Santa Ana Valley Pipeline. The intertie enables the Mills Plant to withstand an extended interruption of supplies from the California Aqueduct East Branch, and it was used during the most recent drought in 2021-2022.

Diamond Valley Lake to Rialto Pipeline

The DVL to Rialto Pipeline operation consists of four individual projects that will enable Metropolitan to pump up to 120 cfs of previously stored SWP supplies within DVL or Colorado River water to the Rialto Pipeline service area using Metropolitan's existing Wadsworth Pump Station and San Bernardino Valley Municipal Water District's Foothill Pump Station. These deliveries will offset demand from member agencies highly dependent on SWP supplies from the California Aqueduct East Branch during low SWP allocation periods. The project can also supply the area in case of an extended interruption of supplies from the California Aqueduct East Branch. The project is estimated to be completed in late 2028.

Sepulveda Feeder Pumping Project

The Sepulveda Feeder Pumping Project will construct two pump stations along the Sepulveda Feeder to enable delivery of treated Colorado River or stored SWP supplies within DVL to member agencies in Metropolitan's western service area that are highly dependent on SWP supplies from the California Aqueduct West Branch. Stage 1 of the project will enable delivery of up to 30 cfs to the dependent area. The pumping operation also saves Metropolitan approximately 30 cfs of additional SWP supplies that would be delivered from the Sepulveda Feeder into other pipelines within Metropolitan's system to maintain water quality within the Sepulveda Feeder. Stage 1 is estimated to be completed in late 2028. A potential Stage 2 will expand the pump station capacity to enable delivery of up to 160 cfs, but is dependent on improvements to the Sepulveda Feeder PCCP pipes and other infrastructure modifications.

SWP Adaptation Strategy

In August 2025, DWR released its State Water Project Adaptiation Strategy. The report outlines DWR's strategy to assess, prioritize, and implement adaptation measures to support the continued function of the SWP under changed climate conditions. It identifies 17 adaptation strategies, with particular emphasis on five key measures: repairing aqueduct subsidence, enhancing asset management, constructing the Delta Conveyance Project, implementing forecast-informed reservoir operations, and expanding south-of-Delta water storage. These strategies are grouped into structural, operational, and nature-based

categories and are evaluated under multiple climate scenarios to test their ability to ensure long-term water reliability, flood protection, and ecosystem resilience. The analysis concludes that the Delta Conveyance Project provides the single most effective strategy, especially when combined with other measures, and that a portfolio approach is essential to address challenges such as rising sea levels, drought, subsidence, and weather extremes. The strategy aligns with statewide water policies, prioritizes disadvantaged communities that rely heavily on SWP supplies, and establishes a framework for continued adaptation and investment to maintain California's water reliability and economic stability under climate change conditions.

3.3 Central Valley/State Water Project Storage and Transfer Programs

Metropolitan endeavors to increase the reliability of supplies received from the California Aqueduct by developing flexible SWP storage and transfer programs. Over the years, Metropolitan has developed numerous voluntary SWP storage and transfer programs to secure additional dry-year water supplies.

Background

Metropolitan has a long history of managing the wide fluctuations of SWP supplies from year to year by forming partnerships with Central Valley agricultural districts along the California Aqueduct, as well as with other Southern California SWP Contractors. These partnerships allow Metropolitan to store its SWP supplies during wetter years for return in future drier years. Some programs also allow Metropolitan to purchase water in drier years for delivery via the California Aqueduct to Metropolitan's service area.

Because yields from individual programs can vary widely depending on hydrologic conditions and CVP/SWP operations, the dry-year yields for the various programs reported in this section are expected values only. In any given year, actual yields could depart from the expected values. Despite that uncertainty, Metropolitan's modeling of these programs indicate that in the aggregate, they can meet the resource target under a wide range of hydrologic conditions and CVP/SWP operations.

In addition, the SWP storage and transfer programs have served to demonstrate the value of partnering, and, increasingly, Central Valley agricultural interests see partnering with Metropolitan as a sensible business practice beneficial to their local district and regional economy.

Implementation Approach

Metropolitan is currently operating several SWP storage programs that serve to increase the reliability of supplies delivered through the California Aqueduct. Metropolitan pursues SWP water transfers on an as-needed basis. Table 3-3 lists the expected yields from these storage and transfer programs. Figure 3-3 shows the location of Metropolitan's statewide groundwater banking programs.

Storage and Transfer Programs

Semitropic Storage Program

Metropolitan has a groundwater storage program with Semitropic Water Storage District (Semitropic) located in the southern part of the San Joaquin Valley. The maximum storage capacity of the program is 350 TAF. The specific amount of water Metropolitan can store in and subsequently expect to receive from the program depends upon hydrologic conditions, any regulatory requirements restricting Metropolitan's ability to export water for storage, and the demands placed on the Semitropic Program by other program participants. In 2014, Metropolitan amended the program to increase the return yield by an additional 13.2 TAF per year. The minimum annual yield available to Metropolitan from the program is currently 34.7 TAF, and the maximum annual yield is 236.2 TAF, depending on the available unused capacity and the SWP allocation. During wet years, Metropolitan has the discretion to use the program to store portions of its SWP water that are in excess of the amounts needed to meet Metropolitan's service area demand. In Semitropic, the water is

delivered to district farmers who use the water in lieu of pumping groundwater. During dry years, the district returns Metropolitan's previously stored water to Metropolitan by direct groundwater pump-in return and the exchange of SWP supplies.

Arvin-Edison Storage Program

The groundwater storage program with Arvin-Edison Water Storage District (Arvin-Edison) provides Metropolitan with a groundwater storage capacity of 350 TAF, with the ability to deliver up to 75 TAF per year. During wet years, Metropolitan can use the program to store its SWP supplies which are in excess of the amounts needed to meet Metropolitan's service area demand. The water can either be directly recharged into the groundwater basin or delivered to Arvin-Edison farmers who use the water in lieu of pumping groundwater. During dry years, Arvin-Edison returns Metropolitan's previously stored water to Metropolitan by direct pump-in return to the California Aqueduct or by exchange of surface water supplies. The specific amount of water Metropolitan can expect to store in and subsequently recover from the program depends upon hydrologic conditions and any regulatory requirements restricting Metropolitan's ability to export water for storage. In 2008, Metropolitan amended the program to include the South Canal Improvement Project which increases the reliability of the program by returning higher quality water to the California Aqueduct. In 2015, Metropolitan funded the installation of three new wells at a cost of $3 million, restoring the return reliability by 2.5 TAF per year. The funding was recovered through credits against future program costs. In addition to groundwater banking, Metropolitan and Arvin-Edison also enter into annual operational agreements for one-to-one exchanges of surface supplies, which provides Metropolitan with water quality benefits and allows Arvin-Edison to access supplies in the hot, summer months when supplies are needed most. Since 2018, Metropolitan has stopped normal operations of the program due to the detection of 1,2,3-trichloropropane (TCP) in Arvin-Edison wells. Currently, Metropolitan deliveries and recoveries to and from the groundwater bank are suspended until the water quality concerns can be further evaluated and managed. However, Metropolitan and Arvin-Edison continue to participate in surface water exchanges as needed.

San Bernardino Valley Municipal Water District Transfer Program

The San Bernardino Valley Municipal Water District Transfer Program allows for the purchase of a portion of the San Bernardino Valley Municipal Water District's SWP supply under surplus conditions. Each calendar year, a determination will be made on how much surplus supplies are available, and Metropolitan will then decide how much will be purchased. The agreement term is until December 31, 2035, and can be extended with a State Water Contract extension.

San Gabriel Valley Municipal Water District Exchange Program

The San Gabriel Valley Municipal Water District program allows for the exchange of up to 5 TAF each year. For each acre-foot Metropolitan delivers to the City of Sierra Madre, a San Gabriel Valley Municipal Water District member agency, the San Gabriel Valley Municipal Water District provides two acre-feet to Metropolitan in the Main San Gabriel Basin, up to 5 TAF. The program provides increased reliability to Metropolitan by allowing

additional water to be delivered to Metropolitan's member agencies Three Valleys Municipal Water District and the Upper San Gabriel Valley Municipal Water District.

Antelope Valley-East Kern Water Agency Exchange and Storage Program

The Antelope Valley-East Kern Water Agency (AVEK) exchange and storage program provides Metropolitan with additional supplies and increased reliability. Under the exchange program, for every two acre-feet Metropolitan receives, Metropolitan returns one acre-foot to AVEK to improve its reliability. The exchange program is expected to deliver 30 TAF over ten years, with 10 TAF available in dry years. Under the program, Metropolitan will also be able to store up to 30 TAF in the AVEK's groundwater basin, with a dry year return capability of 10 TAF.

High Desert Water Bank Program

In December 2019, Metropolitan entered into an agreement with AVEK for the High Desert Water Bank Program to improve water supply reliability during dry years or emergencies and provide greater operational flexibility to balance supplies and demands. Under the program, Metropolitan will have the ability to store up to 280 TAF of its SWP Table A or other supplies in the Antelope Valley groundwater basin. Metropolitan will provide up to $211 million for the construction of monitoring and production wells, turnouts from the California Aqueduct, underground and aboveground pipelines, recharge basins, water storage, and booster pump facilities. Metropolitan will have first priority to 70 TAF per year of both put and take capacity. The project is anticipated to be fully operational by 2030.

Kern-Delta Water District Storage Program

This groundwater storage program has 250 TAF of storage capacity. The program is capable of providing up to 50 TAF of dry-year supply. In 2015, Metropolitan agreed to fund the cross-river pipeline that, when completed, will help improve Metropolitan's return reliability by reducing losses during exchanges. Metropolitan has not incurred any cost to date, as the pipeline has not been constructed. Environmental and regulatory issues have delayed implementation of the pipeline. Water for storage can be either directly recharged into the groundwater basin or delivered to district farmers who use the water in lieu of pumping groundwater. During dry years, the district returns Metropolitan's previously stored water to Metropolitan by direct groundwater pump-in return or by exchange of surface water supplies.

Mojave Storage Program

Metropolitan entered into a groundwater banking and exchange transfer agreement with Mojave Water Agency on October 29, 2003. This agreement was amended in 2011 to extend the term of the program through 2035 and to allow for the cumulative storage of up to 390 TAF. The agreement allows for Metropolitan to store water in an exchange account for later return. Through 2021, Metropolitan was able to annually withdraw the Mojave Water Agency's SWP contractual amounts in excess of ten percent. After 2021, the withdraw rate decreased, reserving 20 percent of the Mojave Water Agency's SWP contractual amounts. Under a 100 percent SWP allocation, the State Water Contract provides the Mojave Water Agency 89.8 TAF of water.

Presently, the Mojave Water Agency is not accepting additional water from Metropolitan.

Central Valley Transfer Programs

Metropolitan secures Central Valley water transfer supplies via spot markets and option contracts to meet its service area demands when necessary. Hydrologic and market conditions, and regulatory measures governing Delta pumping plant operations, will determine the amount of water transfer activity occurring in any year. Transfer market activity, described below, provides examples of how Metropolitan has secured water transfer supplies as a resource to fill anticipated supply shortfalls needed to meet Metropolitan's service area demands.

In 2003, Metropolitan secured options to purchase approximately 145 TAF of water from willing sellers in the Sacramento Valley during the irrigation season. These options protected against potential shortages of up to 650 TAF within Metropolitan's service area that might have arisen from a decrease in Colorado River supply or as a result of drier-than-expected hydrologic conditions. Using these options, Metropolitan purchased approximately 125 TAF of water for delivery to the California Aqueduct.

In 2005, Metropolitan, in partnership with seven other SWP contractors, secured options to purchase approximately 130 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was 113 TAF. Metropolitan also had the right to assume the options of the other State Water Contractors if they chose not to purchase the transfer water. Due to improved hydrologic conditions, Metropolitan and the other State Water Contractors did not exercise these options.

In 2008, Metropolitan, in partnership with seven other SWP contractors, secured approximately 40 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was approximately 27 TAF.

In 2009, Metropolitan, in partnership with eight other buyers and 21 sellers, participated in a statewide Drought Water Bank, which secured approximately 74 TAF, of which Metropolitan's share was approximately 37 TAF.

In 2010, Metropolitan, in partnership with three other SWP contractors, secured approximately 100 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was approximately 88 TAF. Metropolitan also purchased approximately 18 TAF of water from Central Valley Project Contractors located in the San Joaquin Valley. In addition, Metropolitan entered into an unbalanced exchange agreement that resulted in Metropolitan receiving approximately 37 TAF.

In 2015, 2021, and 2022, Metropolitan secured water transfer supplies from willing sellers in the Sacramento Valley in partnership with other SWP contractors. Metropolitan's share of supplies in those years was approximately 13 TAF, 6 TAF, and 8 TAF, respectively, prior to Delta conveyance losses.

In 2025, Metropolitan executed multi-year option agreements with Western Canal Water District and Richvale Irrigation District for the first right to purchase their available water supplies during 2025 through 2028. Metropolitan paid each district a one-time option fee of $250,000 for the first right to purchase up to 53 TAF at a price of $600 to $965 per AF, depending on the SWP allocation. Metropolitan did not call on these supplies in 2025 due to favorable water supply and storage conditions.

In addition, Metropolitan has secured water transfer supplies under the Yuba Accord, which is a long-term transfer program that expired in 2025. Metropolitan engaged in negotiations with DWR, Yuba County Water Agency, and other participating contractors to extend the Yuba Accord long-term transfer program through 2050. To date, Metropolitan has purchased approximately 250 TAF.

Metropolitan has also secured water transfer supplies under the Multi-Year Water Pool Demonstration Program, which was developed as an alternative to the Turnback Pool provisions of the SWP contracts. In 2013, 2015, and 2016, Metropolitan secured 30 TAF, 1.3 TAF, and 7 TAF, respectively. The Turnback Pool was eliminated by the 2021 Water Management Amendment to the SWP contracts. This amendment provided increased flexibility for SWP contractors and allows for transfers of SWP supplies between SWP contractors on a single-year and multi-year basis, with compensation determined by buyers and sellers.

In 2025, Metropolitan transferred SWP supply outside of the service area for the first time, pursuant to the new flexibility allowed under the 2021 Water Management Amendment. Metropolitan's board authorized outside water sales during 2025 and 2026 to help generate the new revenues assumed in the budget adopted by the board in April 2024. Metropolitan executed a water sale for up to 100 TAF of 2025 Table A to the Westside Districts, comprised of four Kern County Water Agency member units and Dudley Ridge Water District. Metropolitan also sold 5 TAF of 2025 Table A supply to the San Gabriel Valley Municipal Water District. In addition, Metropolitan sold 10 TAF of supply in-ground to Semitropic Water Storage District, consisting of Metropolitan Table A previously delivered in 2024. In addition, Metropolitan sold 10 TAF, and plans to sell 20 TAF of supply in-ground to Semitropic Water Storage District, consisting of Metropolitan Table A previously delivered in 2024 and 2025, respectively. These transactions generated $19.25 million in revenue in 2025 and are expected to generate $37.25 million in 2026.

Metropolitan's recent water transfer activities demonstrate Metropolitan's ability to develop and negotiate water transfer agreements either working directly with the agricultural districts who are selling and purchasing water, or through a statewide Drought Water Bank. Because of the complexity of cross-Delta transfers and the need to optimize the use of both CVP and SWP facilities, DWR and USBR are critical players in the water transfer process, especially when shortage conditions increase the general level of demand for transfers and amplify ecosystem and water quality issues associated with through-Delta conveyance of water. Therefore, Metropolitan views state and federal cooperation to facilitate voluntary, market-based exchanges and sales of water as a critical component of its overall water transfer strategy.

Table 3-3 summarizes Metropolitan's Central Valley/SWP transfer programs supply range for 2040. The supply capabilities shown reflect actual storage program conveyance constraints. In addition, SWP supplies are estimated using DWR's 2025 Draft SWP Delivery Capability Report released in October 2025. Appendix 3 provides a detailed discussion of the current Central Valley and SWP storage and transfers programs and programs that are under development.

Table 3-3
Central Valley/State Water Project Storage and Transfer Programs
Supply Projection
Calendar Year 2040
(acre-feet per year)

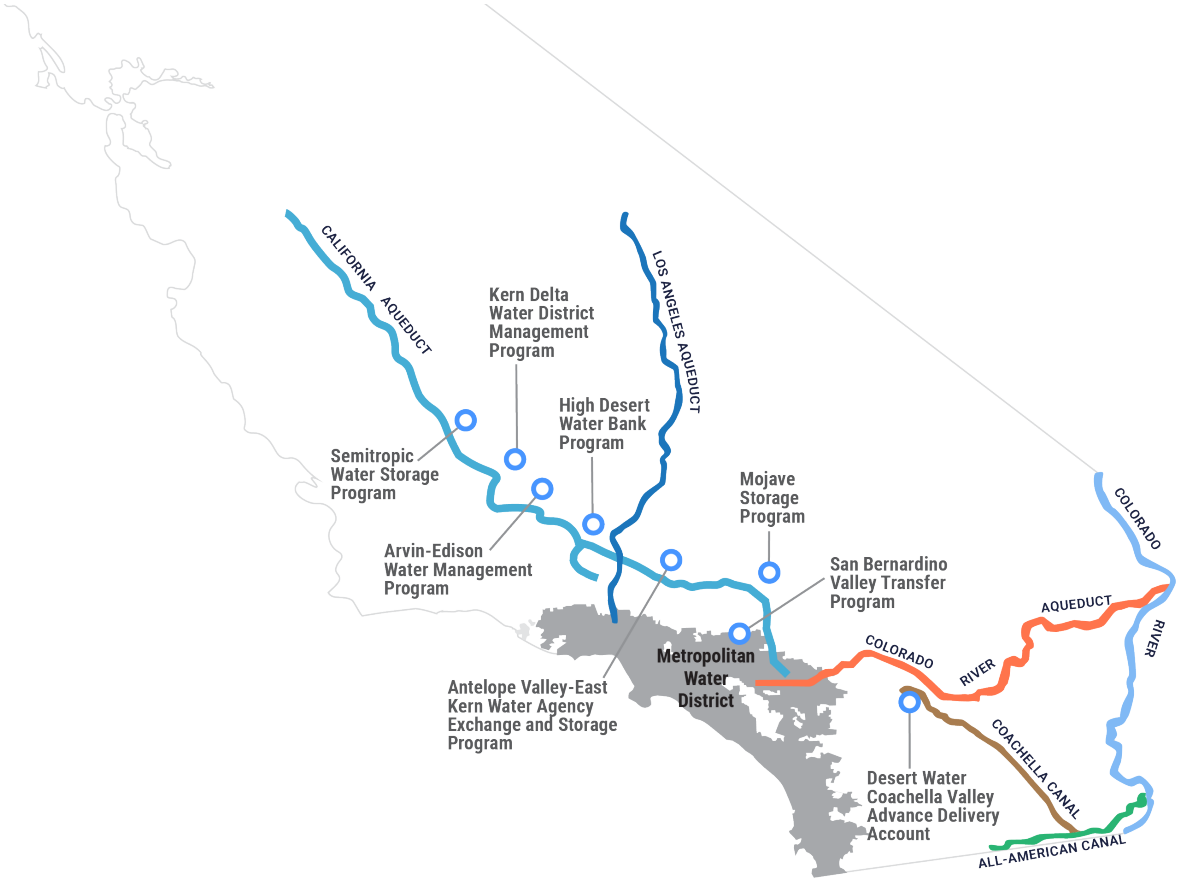
Hydrology	Five-Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
Central Valley Storage and Transfers			
Semitropic Program	50,000	45,000	64,000
Arvin Edison Program*	66,000	75,000	75,000
Mojave Storage Program	3,000	0	24,000
AVEK/High Desert Water Bank Program	53,000	70,000	70,000
Kern Delta Program	47,000	50,000	50,000
Transfers and Exchanges	50,000	50,000	50,000
Subtotal of Current Programs	***269,000***	***290,000***	***333,000***
Programs Under Development			
Subtotal of Proposed Programs	***0***	***0***	***0***
Maximum Supply Capability	**269,000**	**290,000**	**333,000**

* Take and put amounts limited due to water quality considerations.

Achievements to Date

Metropolitan has made rapid progress to date developing SWP storage and transfer programs. Between 2021-2025, there were approximately 247 TAF of SWP storage program extractions from the Semitropic, Arvin, Kern Delta, and Mojave programs; 53 TAF of SWP transfer supplies were purchased from the Yuba water purchase programs.

Figure 3-3
Metropolitan's Statewide Groundwater Banking Programs



3.4 Demand Management and Conservation

Demand management through conservation is a core element of Metropolitan's long-term water management strategy. Metropolitan continues to build on a 35-year investment in conservation of more than $954 million, reflecting a long-term commitment to water conservation. Among other measures, this investment has resulted in the replacement of more than 3.8 million toilets with more water-efficient models, rebates of more than 675,000 high-efficiency clothes washers (HECWs), and the removal of approximately 231 million square feet of grass from both commercial and residential properties. Collectively, Metropolitan's conservation programs and other conservation in the region will reduce Southern California's reliance on the delivery of imported water by almost 1.2 MAF in 2030.

Metropolitan's continued approach to conservation resulted in a record low 114 gallons per capita per day of potable water use within its service area in 2023. Continuous conservation messaging, along with active conservation programs, have contributed to Metropolitan maintaining its water demand at sustainable levels, while also providing a foundation for which member and retail agencies can reach their urban water use objectives.

Background

Metropolitan's conservation policies and programs are designed to maintain a sustainable water demand level. These policies and programs directly relate to the demand management measures for wholesale water agencies in the Urban Water Management Planning Act.

Water conservation savings result from active, code-based, and price-effect conservation efforts. Active conservation consists of water-agency-funded programs such as rebates and incentives for water-efficient fixtures and equipment, and turf replacement. Code-based and price-based conservation consists of demand reductions attributable to conservation-oriented plumbing codes and usage reductions resulting from increases in the price of water. Metropolitan does not currently assign a savings value for public awareness campaigns and conservation education because any initial effect on demand reduction and the longevity of the effect are difficult to measure. It is generally accepted that these outreach programs prompt consumers to install water-saving fixtures and change water-use behavior, thereby creating a residual benefit of increasing the effectiveness of complementary conservation programs.

Distinguishing between active, code-based, and price-effect conservation can be analytically complex when, for example, active programs for fixtures are concurrent with conservation-related plumbing codes. Metropolitan uses a specially designed estimating model to quantify and project conservation savings. This model combines active, code-based, and price-effect conservation savings using methods that avoid double counting.

Conservation savings are commonly estimated from a base-year water-use profile. Metropolitan uses 1980 as the base year because it marked the effective date of a new plumbing code in California requiring toilets in new construction to be rated at 3.5 gallons per flush or less. Between 1980 and 1990, the region saved an estimated 250 TAF per year as the result of this 1980 plumbing code and unrelated water rate increases. These savings are referred to as "pre-1990 savings."

Including regional pre-1990 conservation savings, Metropolitan anticipates savings of nearly 1.2 MAF in 2030. A large share of the savings has already been achieved through existing Metropolitan and member agency programs, pre-1990 savings, price effects, and continued savings that accrue from plumbing codes. The remainder is expected to be achieved through additional agency-sponsored active conservation programs, code changes, and price effects.

Implementation Approach

Metropolitan's approach to achieving conservation depends on implementing a suite of demand management measures, including public education and outreach, a variety of conservation programs, metering, research and development, and asset management. These programs include cost-effective active conservation programs and new, innovative programs that address regional water usage. Metropolitan also provides support to member agencies for local programs that assist with implementing local conservation programs while reducing per capita water use. Metropolitan continues to seek state and federal grant funding for conservation in coordination with its member agencies.

As the California Urban Water Conservation Council (CUWCC) disbanded in 2016, Metropolitan worked with other California water agencies to form the California Water Efficiency Partnership (CALWEP). CALWEP's mission is to maximize urban water efficiency and conservation throughout California by supporting and integrating innovative technologies and practices; encouraging effective public policies; advancing research, training, and public education; and building collaborative approaches and partnerships. Metropolitan is an active participant on the CALWEP Board, the Program Committee, and the Research Committee.

Metropolitan also participates in national water efficiency efforts. Metropolitan is a USEPA WaterSense partner, helping to promote water-efficient products and practices in Southern California. Metropolitan is also a member of the Alliance for Water Efficiency, participating on its Board and in the committees on research, WaterSense and water efficient products, and education and outreach.

The following sections describe Metropolitan's demand management measures and conservation programs, including education and outreach.

Public Education and Outreach

For decades, Metropolitan has implemented robust outreach and education programs to promote public engagement in water conservation and demand management. These efforts include school-based education programs, conservation-focused media campaigns, and a community partnering program that collaborates with other organizations on water education initiatives. In addition, Metropolitan's dedicated press office has conducted hundreds of interviews with news media, while staff have engaged thousands of individuals through presentations and facility tours. Through these collective efforts, Metropolitan has reached millions with vital messages about water resources and the importance of conservation.

Education Programs

Since 1983, Metropolitan's Education Team has provided award-winning water education programs, classroom presentations, teacher workshops, scout programs, and supplemental materials to K–12 teachers and students across Southern California. Over the past 20 years, this outreach has expanded to include pre-K through college-level audiences, growing in scope and technological sophistication. Staff have prioritized a more inclusive approach to ensure equitable participation from schools in underserved communities. Students are provided with advocacy tools and information to empower them to take action in their schools and communities.

Metropolitan's current initiatives are designed to engage Generation Z—currently navigating high school, college, and early careers—and Generation Alpha, the youngest learners just beginning their educational journeys. These digital-native generations are defined by their technical fluency, global awareness, and desire for purpose-driven work. Metropolitan's education programs provide future-focused learning experiences that inspire stewardship, civic responsibility, and interest in science, technology, engineering, arts, and math (STEAM).

While preserving traditional methods, Metropolitan has modernized its goals to focus on strategic partnerships and technological innovation—resulting in more impactful programming for students and teachers. As of 2025, these initiatives continue to shape and enrich learning. Metropolitan's efforts have influenced an entire generation, deepening their understanding of California's complex water systems, conservation practices, water science, public policy, and the value of stewardship.

Through collaboration with member agencies and community organizations, Metropolitan's Education Team supports over 100 virtual and in-person field trips, school presentations, outreach events, and workshops annually— engaging more than 15,000 students, educators, scouts, and families each year. These programs are described in Table 3-4.

In addition to school programs, Metropolitan advances strategic partnerships for workforce development, water reuse, and conservation. Partnerships implemented in the past five years include:

- Collaborated with the California Department of Water Resources (DWR), the Water Energy Education Alliance (WEEA), and Project WET (Water Education Today) to host a statewide, two-day seminar for water educators, community colleges, utilities, and businesses.
- Commissioned a study on water careers – in coordination with WEEA and the Center of Excellence for Labor Market Research—identifying mission-critical occupations over the next decade.
- Hosted Water Careers: From Classroom to College to the Workplace, in coordination with WEEA and the San Diego County Water Authority.
- Launched a Cybersecurity Internship Program for Narbonne and Carson High School students, in partnership with West Basin Municipal Water District and Tomorrow's Talent Inc., an organization recognized for building industry-education pipelines.

- Hosted multiple Teacher Institutes in collaboration with the California Environmental Education Foundation (CEEF), Project WET, Municipal Water District of Orange County, and DWR. Lessons addressed drought, conservation, water reuse, sustainability, and environmental literacy.
- Partnered with the Los Angeles County Office of Education in support of the annual Science and Engineering Fair, and more recently, the annual Girls in STEM event at the Los Angeles Zoo.
- Partnered with Project WET to co-brand four middle school activity booklets on water reuse, drought, conservation, and urban water cycle. The booklets are correlated to California's Common Core and Next Generation Science Standards.
- Partnered with WeTap, a community non-profit, to develop and host the Teacher Toolkit for Tap Water Day on the education website. More than 2,000 educators downloaded the toolkit, which provides teachers with activities and information to inform students of the value of water.
- Co-sponsored TreePeople's Youth Summit where students participate in hands-on activities focused on topics such as water conservation and native ecology. The summit also emphasized youth-led initiatives, with students sharing their own projects like campus recycling programs.
- Co-sponsored Compton STEAMFest, a technology festival, and staffed an interactive booth where students built their own waterwise garden kits.

This continued investment in water education ensures that Gen Z and Gen Alpha are not only informed and inspired, but also equipped to become leaders in their schools and communities who protect, conserve, and advocate for California's most precious resource: water. By aligning with the learning styles and values of today's youth, Metropolitan cultivates a future-ready, skilled workforce and fosters lifelong interest in conservation, green careers, sustainability, and public service.

Outreach

For more than a decade, Metropolitan has used a wide range of communications tools to educate Southern California residents on the importance of maintaining a strong conservation ethic amid extreme weather and a changing climate. Each year, Metropolitan executes dynamic, research-driven outreach campaigns across multiple platforms and in multiple languages, tailored to reflect current water supply conditions, state policies, and local needs. In addition to paid advertising, Metropolitan's Press Office plays a critical role in advancing these messages and supporting broader initiatives by securing news coverage, coordinating interviews, issuing press releases, and ensuring the district's voice is part of the public dialogue on water reliability and sustainability.

Fiscal Year 2019-20

In fiscal year (FY) 2019-20, the "Save Water 365" campaign promoted higher value rebates offered under Metropolitan's revamped Turf Replacement Program. The campaign reached audiences through several platforms, including digital billboards that encouraged residents to "ditch their grass and claim their rebate," and radio spots in English and Spanish on nearly 40 radio stations. Creative digital advertisements directed online audiences to the

rebate application, generating nearly 120 million online impressions and 300,000 clicks. Turf Replacement Program advertisements in English, Spanish, and Chinese ran in 25 publications, and reached 1.7 million readers across Metropolitan's diverse service area. Metropolitan also partnered with Los Angeles-and San Diego-based television news shows to produce water conservation programming in English and Spanish. On-air talent spoke about the benefits of replacing lawns with California Friendly® and native landscaping, and promoted Metropolitan's turf rebate.

In fall 2019, Metropolitan launched a multilingual digital campaign that continued to raise awareness of the turf rebate incentive. Digital display banners on home improvement and lifestyle websites encouraged viewers to save water and money by switching to sustainable landscapes. Together with search advertising, these placements generated 151 million impressions and thousands of turf rebate applications. To supplement digital outreach to large and diverse audiences, Metropolitan partnered with Southern California's professional sports teams including the Angels, Dodgers, Rams, Chargers, Lakers, Clippers, and Kings to promote water use efficiency. With zero outside production costs, staff designed an award-winning social media campaign that engaged more than 200,000 people online. The National Association of Government Communicators honored the campaign titled "Patch Match" with a first-place award in the social media category.

In late 2019, staff once again brought creative concepts to fruition with the "Wasting Water Is…" campaign. This three-part digital commercial series was produced and directed in-house and featured scenarios where water wasters learn how scary, tragic, and offensive wasting water really is. Production costs for all three commercials totaled less than $50,000, compared to typical advertising agency costs of $300,000 to $500,000 per video.

Response to COVID-19

Metropolitan's outreach messaging pivoted during the pandemic to provide immediate reassurance to the public about the safety and reliability of the region's water supply. Projects included statements from Metropolitan's leadership, media relations, fact sheets, FAQs, and a new webpage dedicated to COVID-19 updates. A multilingual advertising campaign ran in 35 newspapers, reaching about 2.5 million readers throughout Metropolitan's service area. Several creative campaigns on social media reinforced safety and reliability messaging, while an employee-focused series on social media highlighted Metropolitan field staff as essential workers. COVID-19 response materials were shared widely, while social media posts received more than 2 million impressions on all platforms combined. Internal communications kept employees updated on Metropolitan's plans, policies, and safety procedures for managing through a pandemic through a dedicated website, creation of facility signage, and other collateral materials.

FY 2020-21

FY 2020-21 was marked by great challenges to the region's water supplies. Two consecutive years of low rainfall and snowpack, and critically low runoff, strained state and local resources, underscoring the unpredictability of a changing climate. Conservation and outreach programs maintained a focus on using water wisely while recognizing customers' past efforts. Staff took a grassroots approach to spread the conservation message mid-pandemic and designed an award-winning "We're California Friendly® Plants" social media campaign as an engaging way to reach new online audiences. The campaign celebrated

water-saving plants and encouraged their use in Metropolitan's Turf Replacement Program. From November 2020 to February 2021, the campaign received some of the highest engagement on social media with a total of 1.5 million impressions. As statewide drought conditions worsened, staff developed a public-facing microsite on Metropolitan's main website, mwdh2o.com. The microsite launched in May 2021 to host the latest drought-related news coverage, media releases, presentations, and outreach materials available to member agencies, media outlets, and the public. In June 2021, staff placed multilingual print advertisements in community newspapers throughout Southern California to increase drought awareness while encouraging Southern Californians to maintain a conservation ethic. These advertisements reached an estimated two million residents.

News media outreach remained a key tool for promoting water conservation. Over the FY, Metropolitan officials conducted more than 70 interviews with major and ethnic media outlets, covering topics such as climate change, drought, water supply reliability, recycled water, and conservation programs. Reporters showed strong interest in Lake Mead's declining levels and the impact on Lower Colorado River Basin users. In response, Metropolitan emphasized growing collaboration among basin partners and highlighted the Regional Recycled Water Program, now called Pure Water Southern California, with Southern Nevada as a model for future solutions. Metropolitan leadership also contributed blogs and op-eds on conservation and long-term planning, including the May 2021 blog "How the Colorado River Benefits from Conservation." Additionally, staff launched a redesigned website featuring interactive maps and a new Colorado River section focused on water reliability.

FY 2021-22

After three years of record-breaking drought, Southern California's water supply was under unprecedented pressure. In response, Metropolitan expanded its conservation outreach and advertising efforts to urge residents, businesses, and communities to reduce water use even further. August 2021 marked several critical milestones: California Governor Newsom called for a 15 percent voluntary reduction in water use, USBR declared the first-ever Colorado River shortage for 2022, and Metropolitan's Board of Directors issued a Water Supply Alert.

To convey the urgency of these developments, Metropolitan launched a multilingual outreach campaign that thanked the public for past conservation efforts while reengaging them on the need to continue saving water. A multimedia advertising push supported this message, focusing on drought conditions and the importance of ongoing conservation. The campaign ran across social, digital, radio, and outdoor platforms, generating 42 million impressions by fall 2021. As dry conditions persisted into winter, staff shifted to more urgent messaging. In October, Metropolitan produced two digital commercials titled, "Water Zombies," urging the public to conserve even more by spotlighting mindless water waste, drawing nearly 200,000 YouTube views. By November, a new round of media buys directed audiences to bewaterwise.com for water-saving resources, rebates, and a conservation toolkit. The buys ran through April 2022 across regional and national news outlets, ethnic radio stations, and Spanish-language billboards in Latino grocery stores.

As dry conditions continued, Governor Newsom issued a March 2022 executive order urging a 20 to 30 percent reduction in water use. In response, Metropolitan signed a

$10.5 million, three-year agreement with media agency GP Generate to expand high-impact media placements throughout the region. At the same time, staff initiated public opinion polling, which showed that Californians were willing to conserve more with support and rebates. That insight shaped the spring/summer campaign titled “This Is How We Save Water,” which featured real people sharing practical tips like using rebates for California Friendly® landscaping or installing flow monitors to detect leaks.

With deteriorating hydrologic conditions and low storage capabilities on the SWP system, it became clear that there was insufficient SWP supply for Metropolitan to meet the demands of a portion of the service area that relied on SWP water. In April 2022, the board declared a Water Shortage Emergency for the SWP-dependent area, serving about six million residents, and launched an Emergency Water Conservation Program. The program provided financial support to help agencies enforce restrictions and boost local outreach. To address this urgency, Metropolitan created a separate outreach campaign for SWP-dependent communities, distinct from the regional conservation campaign and with unique messaging, geo-targeting, and media strategies.

Metropolitan’s spring/summer 2022 media plan totaled $3.5 million and included traditional media platforms. In-house production allowed the full budget to go toward media buys while offering flexibility to update messaging based on evolving drought conditions. Creative assets were translated into six languages and featured across ethnic media channels. Television integrations on major networks highlighted the drought and shared water-saving tips. New landing pages provided the service area with downloadable toolkits in English, Spanish, and Chinese. This generated nearly 500 million impressions and over 200,000 visits to bewaterwise.com.

A 30-second in-house commercial, translated into multiple languages and streamed on connected TV platforms like Roku and YouTube, received 18 million YouTube views. The media plan also included placements at electric vehicle charging stations and gas stations, and an in-house produced mobile game advertisement titled “Tap the Tap.” A social media influencer campaign was included in the outreach strategy to leverage networks of spokespeople and artists, helping spread the conservation message to large, diverse audiences. Beyond advertising, staff partnered with organizations like Armstrong Gardens and TreePeople to support outdoor water conservation efforts. Complementing paid advertisements, earned media coverage of the drought brought widespread attention. From July to August 2022, media outreach delivered an estimated 380 million views, valued at $4.3 million—exceeding the annual paid advertising budget in just two months.

FY 2022-23

Climate change and extreme water supply swings in FY 2022-23 not only strained the region’s water resources but also challenged Metropolitan’s communications strategy. The year began with severe drought and emergency watering restrictions and ended with heavy winter storms that replenished snowpack and reservoirs. These rapid shifts underscored the region’s climate extremes and the ongoing need for enhanced conservation.

In response, Metropolitan continued the $3.5 million multilingual outreach campaign across television, radio, digital, outdoor, and print media from July to November 2022. The “This is How We Save Water” campaign was expanded to highlight the urgency of conservation amid worsening water supply conditions. The campaign prioritized in-language outreach,

airing 6,000 radio spots in English, Spanish, Chinese, Korean, and Vietnamese, reaching nearly 40 million impressions. Advertisements also appeared in local Latino and Asian grocery stores and across 600 outdoor placements.

Emergency watering restrictions remained for agencies dependent on SWP supplies, so staff ran a parallel, visually distinct billboard and transit campaign targeting the nearly six million affected residents. Advertisements were translated into Spanish and Armenian, with geo-targeted placements to maximize visibility in communities where the languages are predominantly spoken. Metropolitan continued to partner with social media influencers to engage younger, hard-to-reach audiences. The collaboration with the all-female punk rock band The Linda Lindas generated over 100,000 Instagram views, with 47 percent engagement from users aged 13 to 24, which is far beyond industry standard. A campaign with skateboarder and photographer Atiba Jefferson reached more than 250,000 new users and a new demographic for Metropolitan.

As winter storms improved water conditions, Metropolitan shifted from drought messaging toward an emphasis on weather extremes and a call for continued conservation. Campaign visuals, scripting, and media strategy were updated to reflect changing conditions and direct audiences to bewaterwise.com for resources. The second campaign strategy launched in March 2023, drove website traffic up nearly tenfold to nearly 3,000 visits per day. For Earth Month, messaging appeared on the nation's largest digital billboard at The Reef in Los Angeles, reaching millions. In spring 2023, Metropolitan expanded influencer outreach with beauty entrepreneur Josie Maran and designer Justina Blakeney. Staff also produced three bilingual social media videos with actor and comedian Fred Armisen, offering outdoor water-saving tips in English and Spanish and reaching nearly 200,000 Spanish-speaking viewers.

Reaching the commercial, industrial, and institutional sectors was central to Metropolitan's outreach. In May 2023, Metropolitan held its first One Water Awards, honoring six businesses and municipalities for water-efficiency projects expected to save over one billion gallons in the next decade. Funded by Metropolitan's Water Savings Incentive Program, the projects celebrated included smart irrigation, recirculation systems, and soil moisture sensors. The event drew nearly 100 public- and private-sector water leaders and elected officials.

Metropolitan's Press Office leveraged strong media interest in Metropolitan's emergency drought restrictions, which continued through March 2023, to spotlight the Turf Replacement Program. As residents temporarily reduced outdoor water use, interest in permanent solutions grew. Highlighting an employee's lawn transformation helped generate local media stories, alongside national coverage in CNN, the New York Times, and the Wall Street Journal. Media attention on the region's local programs continued with Metropolitan's co-sponsorship of AB 1572, aimed at limiting potable water use for nonfunctional turf.

The press team also used sustained interest in the Colorado River supply to emphasize long-term water efficiency, especially reductions in outdoor watering figures. As reporters inquired about the region's water future, they showed strong interest in resiliency projects like Pure Water Southern California, formerly known as the Regional Recycled Water Program. Metropolitan staff provided interviews and explained the science and reliability

behind the treatment process, helping to build public understanding and support for the project.

FY 2023-24

Extreme shifts in water supply during FY 2022-23 shaped Metropolitan's communications strategy. Rapid changes, ranging from historic drought to record rainfall, created an evolving narrative anchored by one consistent message: an unwavering commitment to sustained conservation. By fall 2023, the Colorado River remained in long-term drought, while early winter storms improved SWP supplies and boosted storage. Despite the surplus, messaging remained focused on long-term conservation as a necessary response to increasingly extreme and unpredictable weather.

Through November 2023, Metropolitan's water conservation campaign ran across television, outdoor, digital, radio, and social media platforms, emphasizing the importance of conservation and highlighting regional efforts to maintain supply reliability. Ads appeared in six languages and generated 577 million impressions on a $2.6 million budget. Social media influencer partnerships continued, featuring actor Kyle MacLachlan promoting sustainable landscaping, and designers Katie Zamprioli and Dabito showcasing colorful California Friendly® gardens. The year ended with "An Enchanted Transformation," a puppet show collaboration with Bob Baker Marionette Theatre promoting water-wise gardening. These efforts reached hundreds of thousands on Instagram and drove traffic to bewaterwise.com.

In March 2024, Metropolitan introduced a new tree rebate as part of the Turf Replacement Program to encourage residents to replace lawns with sustainable landscaping and to plant trees to expand cities' canopies. Staff hosted a press event to announce the program's launch and co-branded a tree care guide resource in partnership with nonprofit organization TreePeople. Outreach to commercial, industrial, and institutional sectors gained momentum following the October 2023 passage of AB 1572, legislation designed to eliminate watering of nonfunctional turf with potable water supplies. Outlets like KFI-AM 640, KNX-AM 1070, and Spectrum News covered the issue, along with local publications highlighting its regional impact. In May 2024, Metropolitan hosted its second annual One Water Awards, honoring four organizations for remarkable water-efficiency achievements. In June 2024, the board approved a three-year, $10.5 million agreement with media agency We Are RALLY to manage Metropolitan's media buys while maximizing value and reach.

Metropolitan's Press Office staff continued leveraging strong media interest in water resources to raise awareness about supply challenges and investments in regional water resilience. Leadership and subject matter experts participated in nearly 200 interviews with local, state, and national outlets, reaching audiences an estimated 260 million times with a publicity value of $3.3 million.

Metropolitan's Press Office also earned coverage for the $3 million awarded through the Future Supply Actions Funding Program, which supports planning studies and pilot projects to advance recycled water, stormwater, desalination and groundwater initiatives. Outreach for the Pure Water Southern California Program continued, including events celebrating new federal funding and renaming the innovation center in honor of Congresswoman Grace F. Napolitano, reinforcing the project's role in strengthening Southern California's water supply portfolio.

FY 2024-25

With improved water supply conditions, record reserves, and an enhanced focus on long-term sustainable solutions, conservation messaging continued to highlight the region's ongoing commitment to ensuring a reliable water future for all Southern Californians. Since 1990, Metropolitan's estimated regional potable water use declined from 209 gallons per capita per day, or GPCD, to 114 GPCD in calendar year 2023. Ongoing conservation efforts and continued investments in water use efficiency shaped outreach messaging and communication strategies, particularly as summer 2024 marked the hottest season on record.

With the Summer 2024 Olympics Games in full swing, staff developed a digital campaign where creative design bridged water conservation with team sportsmanship, underscoring a collective water-saving effort. To remain cost-conscious, staff leveraged online marketing tools that help reach millions while keeping costs low. The campaign ran through September 2024, where the second half of the strategy focused on sustainable and water-efficient landscapes to promote Metropolitan's Turf Replacement Program. The English and Spanish-language advertisements were featured on premier publisher websites, including Southern California News Group publications, garnering over 2 million impressions.

Following the record-breaking summer weather, staff launched the "Goodbye Grass" campaign in fall 2024 as an ode to the beauty and environmental benefits of California Friendly® and native landscapes. Carefully crafted messages were paired with striking visuals of blooming water-saving plants contrasted by parched, thirsty lawns. Advertisements were translated into seven languages and featured on digital, radio, outdoor and platforms through winter 2024, generating over 160 million impressions combined.

The "Goodbye Grass" creative evolved in the spring 2025 media plan, informed by member agency feedback as the region grappled with the devastating impact of the January wildfires in Los Angeles County. To help foster direct, memorable community engagement, staff developed the Bloom Box exhibit in collaboration with iHeartMedia to showcase an immersive California Friendly® plant experience complete with a sound bath recorded in-house and real examples of sustainable gardens. Over 30,000 people interacted with the Bloom Box at events like KIIS FM's Wango Tango and Long Beach Juneteenth. Spanish-language mini billboards at popular Latino grocery stores like Superior and Vallarta, and mobile billboards at key commuter and commercial zones throughout Ventura County were also part of the media strategy. A partnership with Dodgers Radio spread the conservation message to new audiences during game casts, and translated messaging was featured in ethnic publications throughout the region. These efforts generated over 150 million total impressions.

A focused outreach strategy is now underway to help reach commercial, industrial, and institutional customers ahead of the enforcement of AB 1572, which prohibits watering of nonfunctional turf with potable water on these types of properties starting in January 2027.

Throughout these years, Metropolitan officials conducted hundreds of interviews with news reporters from major TV and print media outlets, ethnic media and community publications to discuss a wide range of water-related issues. Topics included the effect of climate

change, drought, management of Colorado River resources, water recycling, water supply reliability, conservation, and raising awareness about Metropolitan's rebate programs.

Metropolitan continues to provide outreach to Southern California's businesses and industries. Metropolitan is an active member in many chambers of commerce and other business organizations and provides regular updates to members on water policy issues and programs. Water use efficiency programs that help reduce demand for potable water are a key focus of these partnerships. In addition, Metropolitan hosts hundreds of community and business leaders on inspection trips of the SWP and Colorado River Aqueduct to help them better understand the challenges of providing reliable water to Southern California and how the Colorado River is managed to provide water for urban areas and agriculture.

Community Partnering Program

The Community Partnering Program (CPP) is designed to extend Metropolitan's outreach into communities by providing up to $3,000 per grant for the development and delivery of water conservation and education programs or events across its service area. Over the past five fiscal years, Metropolitan has supported approximately 155 grant partnerships through the CPP, awarding a total of $405,000 in sponsorships to nonprofit organizations, member agencies, public resource agencies, and educational institutions. Funded activities have included California native gardens, Earth Day celebrations, community forums, multi-generational water education events, workshops, publications, and other initiatives focused on water-use efficiency, stewardship, youth engagement, and regional water issues. In 2023, Metropolitan introduced a pilot program that awards up to two larger $10,000 grants each fiscal year to support partnerships with broader reach and greater impact.

California Friendly Landscape Education and Training Program

Metropolitan provides education and training on ways to conserve water in homes and landscapes. Offerings include in-person and online classes, surveys, and audits.

Landscape Classes

Metropolitan offers in-person and online courses in irrigation efficiency and water-wise garden design through its California Friendly Landscape and Native Plant Training Program. Metropolitan also offers Turf Replacement Classes, and in 2020, introduced the Water Efficient Landscape Dual Certification Program in partnership with the California Landscape Contractors Association. This program provides a unique educational opportunity for landscape professionals in Southern California to earn two EPA WaterSense certifications as Certified Water Managers and Qualified Water Efficient Landscapers, in a single 3-day course. In FY 2024-25, Metropolitan conducted 132 classes for 3,300 attendees throughout Metropolitan's service area.

Landscape Irrigation Surveys

Metropolitan provides irrigation surveys for large landscape customers as well as virtual and in-person residential surveys. These surveys are performed by a certified Landscape Irrigation Auditor and provide the customer with specific recommendations on how to improve irrigation efficiency at the site. The survey report generated by the auditor also provides information on incentives to help the customer fund the needed improvements. In FY 2024-25, 70 large landscape surveys and 540 residential surveys were conducted.

Water Conservation Programs

Metropolitan's water conservation programs focus on two main areas: (1) residential water use, and (2) commercial, industrial, and institutional water use. Metropolitan directly manages regional programs and provides financial support for local programs that are implemented by the member agencies. Metropolitan's Water Efficiency Team provides program development, implementation, administration, monitoring, evaluation, and research.

Metropolitan's Conservation Credits Program (CCP) provides the basis for financial incentives and funding for the conservation programs and other demand management-related activities. Established in 1988, this funding mechanism supports Metropolitan's commitment to conservation as a long-term water management strategy.

The basis of Metropolitan's financial support to member agency conservation efforts is estimated at $195 per acre-foot of water saved up to the device cost. In general, CCP-funded water conservation project proposals must:

- Have demonstrable water savings;
- Reduce water demands on Metropolitan's system; and
- Be technically sound and require Metropolitan's participation to make the project financially and economically feasible.

To improve flexibility for member agency conservation efforts, the program was modified in July 2024 to allow member agencies to use a larger portion of their funding for projects that provide value to the region but where water savings may be difficult to measure.

Table 3-5 summarizes CCP savings and investments. Additional funding for conservation programs has been made available through federal and state government agencies. Metropolitan has worked to obtain a share of this funding to enhance the region's water conservation investments. Table 3-6 describes past sources and uses of these funds.

Table 3-7 summarizes the types and numbers of efficient devices that have been installed through Metropolitan's conservation programs since they began in FY 1990-91.

Regional Conservation Programs

As mentioned above, Metropolitan's conservation programs focus on two main sectors: (1) residential water use, and (2) commercial, industrial, and institutional water use.

Residential Programs

Metropolitan's residential conservation activities consist of two major programs:

- SoCal Water$mart – Metropolitan provides a region-wide residential rebate program named SoCal Water$mart. Since its inception in 2008, rebate activity has increased dramatically as many residential customers became increasingly aware of the financial incentives available to them to help offset the purchase of water-efficient devices. To date, this program has helped to replace over 277,000 toilets, 319,000 washing machines, 50,000 smart irrigation controllers, 459,000 rotating nozzles, and hundreds of thousands of other devices and appliances.

- Metropolitan-Funded Residential Programs Administered by Member Agencies – Metropolitan's member and retail agencies also implement local residential water conservation programs within their respective service areas and receive Metropolitan incentives for qualified retrofits and other water-saving actions. Typical projects include premium high-efficiency toilet distributions, locally administered clothes washer direct-installation programs, turf replacement programs, and residential water audits.

Residential Rebate Items

Metropolitan provides incentives on a variety of water-efficient devices for the residential sector. The following is a brief description of current and past devices that contribute to projected conservation savings:

- Turf Replacement (Residential) – About 50 percent of residential household water demand is used for outside irrigation where opportunities to conserve water are substantial. Southern California residents have turned the turf replacement program into Metropolitan's most popular conservation measure. To encourage market transformation, Metropolitan has paid over $242 million in the regional turf replacement program for residential properties since program inception.
- High-Efficiency Clothes Washers – HECWs continue to be a major component of indoor water conservation. The water efficiency of clothes washers is represented by the integrated water factor, which is a measure of the amount of water used to wash a standard load of laundry. Washers with a lower integrated water factor will save more water per wash cycle. Metropolitan has continued to move the water conservation rebate standards by requiring lower integrated water factors for eligible washers. The program eligibility requirement is currently set at an integrated water factor of 3.2, with an estimated water savings of 10,700 gallons per year per washer over a conventional top-loading washer. Metropolitan has also partnered with the Southern California Gas Company (SoCalGas) on a direct-installation program for high-efficiency clothes washers in low-income households.
- Premium High-Efficiency Toilets – Metropolitan has provided incentives for water-efficient toilets since 1988. Metropolitan currently rebates toilets that flush at 1.1 gallons or less. Metropolitan uses the Maximum Performance of Premium Toilet Models testing list to distinguish qualifying models.
- High-Efficiency Sprinkler Nozzles – Pop-up, high-efficiency spray heads provide significant outdoor water savings over conventional nozzles. Field tests and studies have demonstrated that these nozzles apply water more evenly than traditional nozzles with fixed fan spray patterns, creating the potential for water savings. Low precipitation rates associated with these nozzles can also reduce run-off, thereby offering a significant value-added benefit when irrigating sloping landscapes.
- Irrigation Controllers – Smart irrigation controllers and soil moisture sensors adjust irrigation schedules based on water needs, temperature, sunlight, soil moisture, soil conditions, plant types, slope or some combination of indicators. Metropolitan uses the USEPA WaterSense list for eligible controllers.

- Flow Monitor Devices – Flow monitor devices measure a home's water use and can help detect leaks. These are smart devices that can be installed directly on a water meter or to a home's main line. Depending on the installation and device, they can measure indoor and outdoor use and provide real-time updates allowing consumers to more effectively manage their water usage and prevent costly damage due to leaks.

Commercial, Industrial, and Institutional Programs

Metropolitan's commercial, industrial, and institutional (CII) conservation consists of three major rebate and incentive programs:

- SoCal Water$mart Program – The majority of the commercial conservation activity comes from Metropolitan's regional SoCal Water$mart Program, which also issues rebates to multi-family properties.
- Water Savings Incentive Program – The Water Savings Incentive Program provides financial incentives for customized landscape irrigation and industrial process improvements. This program allows large-scale water users to create their own conservation projects and receive incentives for up to ten years of water savings for measured water-use efficiency improvements.
- Metropolitan-Funded Commercial Programs Administered by Member Agencies – Member and retail agencies also implement local commercial water conservation programs using Metropolitan incentives. Projects target specific commercial sectors, with some programs also receiving assistance from state or federal grant programs. Metropolitan incentives are also used as the basis for meeting cost-share requirements for the grants.

Commercial Rebate Items

Metropolitan's CII programs provide rebates for water-saving plumbing fixtures, landscaping equipment, food-service equipment, cleaning equipment, HVAC (heating, ventilation, air conditioning) equipment, and medical equipment.

- Turf Replacement (Commercial) – Similar to the residential sector, water demand for landscape irrigation on commercial, industrial, and institutional properties is significant. Opportunities to conserve water are substantial, particularly in areas with ornamental turf. Approximately 104 million square feet of grass has been removed from commercial, industrial, and institutional properties since program inception through the regional rebate program and member agency turf programs. To encourage market transformation, Metropolitan has paid over $172 million for the regional turf replacement program for commercial properties since its inception. Beginning September 2025, the turf replacement rebate for non-residential property owners increased to $7 per square foot with the support of grant funding from the United States Bureau of Reclamation (USBR) and California Department of Water Resources (DWR). This will extend through the end of 2026, at which point the new incentive amount will be $4 per square foot of turf replaced, thanks to sustained funding from USBR through 2031.

- Commercial Devices – The following is a list of current and past devices that contribute to projected conservation savings:
  - Combination Master Valve/Flow Sensors
  - Connectionless Food Steamers
  - Cooling Tower Conductivity Meters
  - Dry Vacuum Pumps
  - Food Defrosting Equipment
  - High-Efficiency Clothes Washers
  - High-Efficiency Toilets
  - High-Efficiency Urinals
  - Ice Machines
  - In-Stem Flow Regulators
  - Irrigation Flow Sensors
  - Irrigation Master Valves
  - Large Rotors High-Efficiency Nozzles
  - Laminar Flow Restrictors
  - High-Efficiency Nozzles
  - pH Cooling Tower Controllers
  - Plumbing Flow Control Valves
  - Premium High-Efficiency Toilets
  - Pre-Rinse Spray Heads
  - Soil Moisture Sensors
  - Steam Sterilizers
  - Ultra-Low-Flush Toilets
  - Ultra-Low-Flush Urinals
  - Water Brooms
  - Weather-Based Irrigation Controllers
  - X-Ray Processors
  - Zero/Ultra-Low Water Urinals

Future State Restrictions on Irrigating CII Turf

AB 1572, co-sponsored by Metropolitan, was signed into law by Governor Newsom in 2023. This legislation prohibits the use of potable water for the irrigation of nonfunctional turf on commercial, industrial, and institutional properties beginning in 2027. Metropolitan, in partnership with CalWEP, is creating a resource toolkit to assist member and retail agencies with outreach and compliance. The addition of grant funds to the Turf Replacement Program allows Metropolitan to further encourage turf replacement as a means of compliance with the law.

Metering

Metropolitan's water distribution system is metered. Metropolitan has approximately 400 service connections that meter water deliveries to our member agencies. Meters at these service connections are checked every six months or sooner to verify that they are measuring correctly. More extensive maintenance is done on a yearly basis to ensure the meter systems continue to operate reliably.

Research and Development Programs

Metropolitan is committed to conservation research as a way to advance technology, improve program results, and help transform markets. Self-funded studies include determining water savings from municipal leak detection programs, the effectiveness of single-family home pressure relief valves on lowering water demand, quantifying residential water use and water fixture inventory, and analyzing savings attributed to landscape irrigation system improvements.

Metropolitan's Innovative Conservation Program (ICP) is a competitive grant program that evaluates water savings and reliability of new water-saving devices, technologies, and strategies. In partnership with SoCalGas, $275,000 of funding was available for each application round in 2020, 2022, and 2025. Over 60 proposals were evaluated across the three rounds, and a total of 18 were selected for funding. The projects focused on landscape, commercial, industrial, and residential water use applications. The next round of grants will be implemented in FY 2026-27.

Metropolitan has partnered with PlanetScape AI and Flume Data Labs for water conservation research. PlanetScape AI created a turf dashboard which estimates amounts of functional and nonfunctional turf throughout Metropolitan's service area. The dashboard allows users to view turf estimates by land use category at the member and retail agency level. It also calculates the amount of turf within disadvantaged community (DAC) areas. The partnership with Flume Data Labs involves a residential end-use study that aggregates device data from all Flume users within Metropolitan's service area to provide a view of changes over time in household indoor and outdoor use. This information can be broken down by member and retail agency, DAC and non-DAC regions, and climate zones.

Measurement and Evaluation

Measurement and evaluation are important components of Metropolitan's conservation programs. These serve four primary functions:

- Providing a means to measure and evaluate the effectiveness of current and potential conservation programs
- Developing reliable estimates of various conservation programs and assessing the relative benefits and costs of these interventions
- Providing technical assistance and support to member agencies in the areas of research methods, statistics, and program evaluation
- Documenting the results and the effectiveness of Metropolitan-assisted conservation efforts

Metropolitan's staff has served as technical advisors for a number of state and national studies involving the quantification and valuation of water savings.

Recognition for Conservation Achievements

Conservation is an integral part of water supply planning at Metropolitan. Metropolitan works to improve the understanding of the costs and benefits of conservation so investment decisions are both efficient and effective at meeting program goals. As a cooperative member of California's water conservation community, Metropolitan has made significant

contributions to the development and coordination of conservation activities throughout the state. These contributions have been recognized in the form of Gold Star certification from the Association of California Water Agencies and awards from the USBR and California Municipal Utilities Association.

In 2023, Metropolitan initiated the One Water Awards, an effort to recognize certain projects implemented by CII entities that resulted in water savings, but also exemplified community leadership, innovation, and commitment to sustainability and resilience. The One Water Awards were held again in 2024 and 2025. Honorees were recognized by Metropolitan's Board of Directors, and their achievements were showcased through detailed case studies. The resources, including short videos of each of the projects, help extend recognition beyond the event and support ongoing engagement with customers in the CII sector.

Table 3-4
School Education Programs

Education Offerings	Grades	Notes
Water Journeys	Grades 4-College	Students explore water recycling at the Grace F. Napolitano Pure Water Southern California Innovation Center in Carson. The experience includes a workshop, a tour of local wetlands, and water quality science experiments.
DVL Fieldtrip	4-8	While visiting the DVL reservoir, students use digital tools to complete interactive missions in augmented reality. They learn about water conveyance, quality, and treatment in a dynamic, outdoor setting.
Girl Scout Programs	K-12	Metropolitan offers an educational program about Southern California's water sources and conveyance systems.
Scout Programs	K-12	Metropolitan provides a one-day workshop on water conservation and soil erosion, a required course for scouts pursuing their Eagle Scout designation. It equips participants with essential knowledge in environmental stewardship and responsible land management.
School Workshops and Assemblies	Pre-K-College	Educational sessions incorporate both traditional tools and digital platforms to engage students on water topics, creating tangible and informative learning experiences.
Student Art Contest and Gallery	K-12	This program invites K-12 students to submit original artwork illustrating the importance of water in their lives and communities. With more than 12,000 submissions annually, the program showcases student creativity, amplifies their voices, and raises awareness on the importance of water conservation. The winning artwork serves a traveling gallery, displayed at dozens of sites across Southern California.
Water Engineering 4 Good (WE4G)	6-12	A hands-on STEM program that challenges students to design and prototype water conservation tools or systems using recycled and upcycled materials. Students also create a social media post or public service announcement to promote water-saving messages. The program fosters creativity, resourcefulness, and environmental responsibility.
Pando Populus College Outreach and Sustainability Challenge	College	This sustainability-focused competition empowers college students to address real-world environmental challenges through innovation, design thinking, and economic analysis. Interdisciplinary teams explore how science and technology can improve water access, boost efficiency, and promote sustainability to bridge environmental stewardship with practical solutions and entrepreneurial thinking.
Virtual Earth Day Competition	9-12	In partnership with SEI Energize Schools, this annual event engages secondary students in projects centered on energy and water conservation, environmental justice, and climate action. Students present real-world solutions for their schools, homes, and communities—cultivating leadership and meaningful impact.

Table 3-5
Metropolitan's Conservation Credits Program

Fiscal Year	Annual Water Savings [1] (AF)	Lifetime Water Savings [2] (AF)	Investment
2024-25	208,000	48,000	$22 million
2023-24	210,000	76,000	$44 million
2022-23	207,000	62,000	$45 million
2021-22	210,000	44,000	$24 million
2020-21	207,000	54,000	$17 million

1. Annual water savings from programs and devices initiated in the fiscal year and in prior years that are still conserving water.
2. Lifetime water savings from programs and devices initiated in the fiscal year.

Table 3-6
Grant Program Funding

Funding Source	Program/Project	Funding Amount ($1,000s)	Description	Status
CALFED				
	Residential HECW	$925	Increase rebate amount	Completed
	Protector del Agua	$100	Course development	Completed
Prop 13 Grants				
	HECW	$2,500	Increase rebate amount	Completed
	ET Controllers	$1,800	Initiate rebates	Completed
CPUC (w/CUWCC)				
2003	Pre-Rinse Spray Valves: Phase 1	$1,600[1]	12,000 direct installations[1]	Completed
2004	Pre-Rinse Spray Valves: Phase 2	$2,200[1]	17,000 direct installations[1]	Completed
DWR				
2021	Residential and Commercial Turf Replacement Program	$2,000	Increase rebate amount	In Progress
2021	Residential Direct Install Program for Disadvantaged Communities in Partnership with SoCalGas	$2,500	Retrofit indoor and outdoor devices	In Progress
2022	Commercial and Public Agency Turf Replacement Program	$30,000	Increase rebate amount	In Progress
2022	Residential Direct Install Program for Disadvantaged Communities in Partnership with SoCalGas	$5,000	Retrofit indoor and outdoor devices	In Progress
2022	Recirculating Firefighting Training Units Program	$3,000	Fund 20-30 device purchases for local fire departments	In Progress
USBR				
2003	CA-Friendly Landscapes	$182	New home landscapes	Completed
2003	Data Loggers	$50	Software error analysis	Deferred
2004	CA-Friendly Landscapes	$60	New home landscapes	Completed
2004	Synthetic Turf pilot	$220	Provide incentives	Completed
2004	World Forum	$50	College/university grants	Completed
2004	CII Region-wide	$250	Additional dollars to rebate amounts and for administration	Completed
2005	Protector del Agua	$50	Develop web classes	Completed
2005	Landscape Market Analysis	$50	Analyze landscape conservation opportunities	Completed
2005	City Makeover	$50	Public landscapes	Completed
2006	Innovative Conservation Program	$300	Support research projects	Completed
2008	Innovative Conservation Program	$300	Support research projects	Completed
2012	Sprinkler Nozzle Incentive Program	$1,501	Provide incentives	Completed
2013	High-Efficiency Clothes Washer Program Innovative Conservation Program	$500 $100	Provide incentives Support research projects	Completed Completed
2014	California Friendly Turf Replacement: Phase 2 Incentive Program	$300	Provide incentives	Completed
2015	Innovative Conservation Program	$1,000	Support research projects	Completed
2017	Innovative Conservation Program	$1,000	Support research projects	Completed
2022	Public Agency Turf Replacement Program	$2,000	Increase rebate amount	In Progress
2023	Residential Turf Replacement Program	$5,000	Increase rebate amount	In Progress
2024	Residential Direct Install Turf Replacement Program for Disadvantaged Communities	$250	20-30 direct installations	In Progress
2024	Residential Direct Install Program for Disadvantaged Communities in Partnership with SoCalGas	$1,750	Retrofit indoor and outdoor devices	In Progress
Water for the West				
	Protector del Agua	$25	Develop web classes	Completed
Prop 50				
	Residential HECW	$1,660	Increase rebate amount	Completed
	CA-Friendly Landscapes	$423	Common area landscapes	Completed
	High-Efficiency Toilets	$1,000	Increase rebate amount	Completed
	Protector del Agua	$78	Develop online classes	Completed
2008	Residential HECW	$2,000	Increase rebate amount	Completed

[1] This is the funding amount and number of installations that represent Metropolitan's share of the project.

Table 3-7
Conservation Achievements in Metropolitan's Service Area

	Quantity	Units
Commercial Rebated Devices (FY 1990-91 to FY 2024-25)		
Audits/Surveys	17,225	ea
Connectionless Food Steamers	220	ea
Cooling Tower Conductivity Controllers	1,243	ea
Dry Vacuum Pump	42	ea
Toilets	271,946	ea
Urinals	40,932	ea
Ice Machines	194	ea
In-stem Flow Regulators	36,925	ea
High-Efficiency Washers	36,602	ea
pH Conductivity Controllers	408	ea
Plumbing Flow Control Valves	71,617	ea
Pre-Rinse Spray Heads *(No longer rebate eligible)*	17,197	ea
Laminar Flow Restrictors	30,686	ea
High-Efficiency Nozzles	1,782,572	ea
Soil Moisture Sensors	914	ea
Steam Sterilizers *(No longer rebate eligible)*	28	ea
Water Brooms *(No longer rebate eligible)*	6,931	ea
Weather-Based Irrigation Controllers	13,106	acres
Weather-Based Irrigation Controllers	681,893	stations
X-Ray Processors *(No longer rebate eligible)*	185	ea
Large Rotors – High-Efficiency Nozzles	88,140	ea
Synthetic Turf *(No longer rebate eligible)*	7,455,647	sq. ft.
Turf Removal	104,125,725	sq. ft.
Residential Rebated Devices (FY 1990-91 to FY 2024-25)		
Aerators	227,317	ea
Audits/Surveys	154,486	ea
Cisterns	2,543	ea
High-Efficiency Clothes Washers	647,584	ea
Toilets	3,654,297	ea
High-Efficiency Rotating Nozzles	1,352,768	ea
Rain Barrels	189,935	ea
Soil Moisture Sensors	173	ea
Showerheads	1,821,244	ea
Turf Removal *(No longer rebate eligible)*	99,135,133	sq. ft.
Turf Replacement	21,776,382	sq. ft.
Weather-Based Irrigation Controllers	112,177	ea
Weather-Based Irrigation Controllers	40,636	stations

Asset Management Program

In compliance with California Water Code § 10631(e)(2), below is a description of Metropolitan's distribution system asset management program.

Metropolitan's Asset Management Program supports its Infrastructure Reliability Strategy. The goal of Metropolitan's Infrastructure Reliability Strategy is to ensure long-term reliable performance of the system in an efficient and cost-effective manner. Infrastructure reliability is addressed through three programs: the Maintenance Management Program, the Infrastructure Protection Plan, and the Dam Safety Program. The activities performed under these programs allow for Metropolitan to extend the life span of its facilities and equipment and improve the overall reliability of the entire conveyance, treatment, and distribution system.

Metropolitan has a Strategic Asset Management Plan serving as a high-level long-term planning document that sets forth the goals and proposed initiatives of the Asset Management Program. The purpose of the Strategic Asset Management Plan is to specify how organizational strategic priorities are to be converted into asset management goals. It takes a long-term view and considers the combination of organizational needs, stakeholder expectations, and the realities of existing assets and asset management capabilities, while establishing a clear vision of what the future asset management practices will be. A main outcome of the Strategic Asset Management Plan is to further expand the use of asset data for enhanced risk-informed decision making, improved planning, maximizing the value of infrastructure assets, and enhancing the longer-term visibility for its Capital Investment Plan.

Maintenance Management Program

Metropolitan manages the maintenance on approximately 135,000 pieces of equipment located at its five treatment plants, sixteen hydro-electric power plants, five desert pumping plants, 242 miles of canals, and over 5,000 structures on 830 miles of pipeline.

Metropolitan uses a Computerized Maintenance Management System (CMMS) to track, plan, and schedule the required activities. The system currently has over 28,000 preventative maintenance cycles scheduled with approximately 96 percent of these performed at fixed intervals (Time Based). The remaining four percent are performed based on the condition or use of the equipment (Condition Based).

Routine Maintenance, Inspection, and Monitoring

Monitoring, inspection, and maintenance of equipment and facilities are a proactive effort to assess the overall condition of the assets. This effort encompasses identifying needed repairs and performing routine maintenance.

Time-Based Maintenance

Metropolitan currently uses time-based maintenance as the primary means of maintaining equipment reliability. Time-based maintenance for equipment is set at specific time intervals using manufacturer recommendations. These recommendations are used to develop job plans in the CMMS which detail the individual steps required for a particular maintenance operation.

Condition-Based Maintenance

Condition-based maintenance (CBM) relies on an understanding of how a piece of equipment degrades or fails to meet its intended function. It requires a greater depth of understanding of the manufacturer's recommended maintenance, industry standards, or practices. This knowledge is used in conjunction with field experience to develop a technique to gauge the equipment's condition. Through trending or analysis, a determination can then be made as to when the equipment may reach a point where corrective maintenance will be required including rehabilitation or replacement. A regular inspection cycle is set in the CMMS software to evaluate the current equipment condition. High and low condition alarms are also set that trigger a corrective maintenance activity when equipment is starting to degrade, or its use has reached a servicing checkpoint.

Predictive maintenance is a subcategory of CBM that uses diagnostic equipment or testing to determine the equipment condition. Predictive maintenance is also used to detect impending problems before the equipment malfunctions. In some cases, Metropolitan has automated the inspections, such as through online vibration monitoring systems that trend the performance of critical and large equipment. A fundamental characteristic of this type of maintenance is that it provides the capability to anticipate potential problems while the equipment is still operating. This provides several key benefits when compared to time-based maintenance or allowing equipment to reach a point where corrective maintenance is required. These benefits include: improved availability or uptime, enhanced reliability, and reduced cost.

Corrective Maintenance

Corrective maintenance is performed on equipment that either has already failed or has had a problem detected during routine (time or condition-based) maintenance. Corrective maintenance needs to be scheduled, requires replacing equipment components, or involves a shutdown of the impacted system. Corrective maintenance is also tracked, planned, and scheduled in the CMMS.

Major Scheduled Outages/Shutdowns

In addition to the general maintenance described above, Metropolitan may take major systems out of service, such as water treatment plants, large pipelines, conveyance systems, or other large facilities, typically for periods of seven to twenty-one days. This is done to perform major maintenance or repairs on several components or systems, upgrade or add new processes, or perform other important work.

Reports and Metrics

Metropolitan produces internal reports that track maintenance management activities including overall backlog and past due work orders (including any missed regulatory preventive maintenance). In addition, other CMMS reports are available that provide managers, planners/schedulers, and maintenance staff with the data needed to evaluate and track work.

Metropolitan utilizes best management practices and performance metrics from the Society of Maintenance & Reliability Professionals to ensure a reliable and cost-effective maintenance management program.

Infrastructure Protection Plan

Activities under the Infrastructure Protection Plan ensure long-term infrastructure reliability by conducting special condition assessments and vulnerability assessments of Metropolitan's facilities.

Special Condition Assessments

Special Condition Assessments are extensive inspections, investigations, and evaluations of Metropolitan facilities and equipment that go beyond routine maintenance and monitoring activities. The assessments are conducted to identify needed rehabilitation and replacement projects which can lead to long-term reliability programs. These assessments include: inspections of facilities during shutdowns when the facility may otherwise be non-accessible, investigations of systemic issues, and evaluations of Metropolitan's ability to maintain deliveries in the event of an unplanned facility outage or loss of water supply.

Special Condition Assessments may be initiated through requests from Metropolitan's three Operations groups, in response to a specific event or concern within Metropolitan's system, or due to an issue identified within the water industry that could potentially affect Metropolitan. Through these activities, long-term infrastructure reliability programs are developed and executed to ensure that the reliability of Metropolitan's distribution system is unimpeded, and the overall life expectancy of its assets is maintained to the most cost-effective standard possible.

Vulnerability Assessments

Vulnerability Assessments involve simulating hazards such as vehicle impact, flooding, fire, equipment failure, third-party impacts, and earthquakes in order to identify their potential impacts to Metropolitan's ability to deliver water. Like the condition assessments, Vulnerability Assessments utilize operator experience and event reviews to identify potential vulnerabilities and impacts. The assessments evaluate both the reliability of individual facilities, as well as the reliability of Metropolitan's system as a whole, if it is exposed to a potential hazard. It is through these assessments that mitigation options are identified to improve reliability.

Potential mitigation includes facility and equipment upgrades, and procedural changes for designing, operating, or maintaining facilities. In addition, mitigation options may include recommendations for Metropolitan's emergency response planning to improve the capability to respond to an unplanned outage and restore service as quickly as possible. The types of hazards assessed include: seismic activity, hydraulic surge, vehicle impact, equipment malfunction, erosion or flooding, fire, corrosion, wind-blown projectiles, third-party construction, and vandalism.

As a part of the Vulnerability Assessments, a specific set of reliability design criteria for water treatment plants have been developed to ensure optimal reliability, starting in the design phase. These reliability design criteria establish design practices that ensure that reliability is designed into new facilities and that the staff uses these criteria when reviewing each capital project.

Dam Safety Program

Metropolitan owns, operates, and maintains 20 reservoirs under the jurisdiction of the California Division of Safety of Dams (DSOD), and a total of 24 individual dams/structures since Diamond Valley Lake and Lake Mathews have three dams each. Metropolitan's portfolio of dams is comprised of embankment dams, concrete arch dams, and other reinforced concrete structures at water treatment plants.

The Dam Safety Program (DSP) is a robust, proactive, and comprehensive management program that aims to maintain and improve the safety and reliability of Metropolitan's dams and appurtenant structures. The main elements of Metropolitan's DSP include regular inspections, monitoring and surveillance, periodic dam safety assessments, and emergency action planning.

Regular Inspections

Metropolitan's dams are routinely inspected and evaluated by staff, the DSOD, and independent consultants. DSOD conducts inspections annually on all dams, and Metropolitan staff conducts regular inspections at a frequency commensurate with each dam's hazard classification and other factors. Inspection reports are prepared on a monthly, quarterly, or annual basis and are submitted to the DSOD every year.

Monitoring and Surveillance

Dam monitoring systems collect data from a portfolio of instrumentation installed in and around the dams to monitor their safety and performance. Parameters measured include dam internal pressures, water levels, seepage flows, and deformation. Staff regularly review instrumentation data for any signs of potential dam safety issues. Instrumentation data are also submitted to the DSOD on an annual basis.

Metropolitan is currently undertaking a program to modernize and automate dam monitoring systems to improve the reliability and frequency of the data being collected, and to help with early detection of any potential dam safety issues.

Periodic Dam Safety Assessments

Periodic dam safety assessments are conducted by Metropolitan staff and/or independent consultants to evaluate the performance of the dams and to identify any necessary improvements. Metropolitan also coordinates with the DSOD to ensure these assessments are completed in accordance with all dam safety regulations and all current industry standards.

These comprehensive assessments are typically conducted every ten years, or sooner if needed, and incorporate the Risk-Informed Decision Making (RIDM) approach, consistent with the most recent industry best practice.

Emergency Action Plans

Planning for potential emergencies is an important element of Metropolitan's DSP. The planning process includes preparing the flood inundation maps, developing and maintaining an Emergency Action Plan (EAP) for each dam in coordination with local emergency management authorities, regular maintenance and testing of dam monitoring systems,

regular maintenance and exercising of all emergency dewatering equipment, and periodic reviews of EAPs at least annually.

3.5 Recycling, Groundwater Recovery, and Desalination

Metropolitan continues to support local resources development through its Local Resources Program (LRP). The LRP provides financial incentives for local agencies to develop supplies including water recycling, groundwater recovery, and seawater desalination. In addition, Metropolitan is investigating the potential of developing its own recycled water supply. Pure Water Southern California would provide advanced treated water that could be used for both potable and non-potable reuse.

Metropolitan's involvement in local resources development started in 1982 as the Local Projects Program to provide financial incentives to its member agencies to develop recycled water projects. In 1991, Metropolitan established the Groundwater Recovery Program to provide financial assistance for the development of groundwater recovery projects. In 1995, these two programs combined into the LRP. In 2014, Metropolitan refined the LRP and included seawater desalination as another water resource to be eligible in the LRP.

Water recycling projects involve further treatment of treated wastewater that is currently discharged to the ocean, streams, or land and use it instead for non-potable uses such as landscape and agricultural irrigation, commercial, and industrial purposes, and for indirect potable uses such as groundwater replenishment, seawater intrusion barriers, and reservoir water augmentation. Currently, more than half of the water recycling in California occurs in Metropolitan's service area.

Groundwater recovery projects involve the treatment of high salinity or contaminated groundwater for potable uses. Groundwater recovery projects use a variety of treatment technologies to remove undesirable constituents such as nitrates, volatile organic compounds (VOCs), perchlorate, color, and salt. Desalination of brackish groundwater and other local supplies enhances the continued supply reliability of the region by maximizing local groundwater resources.

Metropolitan's service area is also leading the development of seawater desalination in California. The 56,000 AF Carlsbad Desalination Plant in San Diego County started operations in 2015 and is the largest seawater desalination plant in the country. The LRP-funded Doheny Ocean Desalination Project in south Orange County will produce 5,600 AF per year and is currently in the design phase with an anticipated operation date of 2030.

In 2023, Metropolitan initiated two comprehensive studies that explored potential brackish groundwater and seawater desalination in the service area. The studies look to advance the integration of desalination as a viable local water supply option for Southern California by generating an inventory of project opportunities and supply potential, reviewing the current and near-term state of desalination technology advancements, providing a regulatory roadmap for future projects, and assessing project implementation feasibility for the best potential sites. The studies are underway. Metropolitan will incorporate the study findings into future planning efforts.

Metropolitan's Pure Water Southern California program, a partnership with the Los Angeles County Sanitation Districts (Sanitation Districts), would purify treated wastewater from the Sanitation Districts' A.K. Warren Water Resource Facility (Warren Facility). The program could produce an average of 155,000 AF of purified water for groundwater replenishment,

industrial use, and potentially direct potable reuse. The agencies have been working together for over 15 years on the program and are currently operating a demonstration facility, the Grace F. Napolitano Pure Water Southern California Innovation Center (Napolitano Innovation Center) at the Warren Facility to validate the potential treatment trains. The draft Environmental Impact Report (EIR) was released on May 14, 2025. The final EIR was certified by the Board in February 2026. Metropolitan's Board will consider approval of this program in 2026. At full scale, the program would be one of the largest water reuse efforts of its kind in the world.

Background

Recycling

This section provides a description of the wastewater sources that potentially could be recycled. This section also discusses the existing and potential uses of recycled water, as well as the technical and economic issues associated with those uses. In general, Metropolitan supports:

- Increasing water recycling in California and the Colorado River Basin
- Advocating for funding assistance by parties that benefit both directly and indirectly from the use of recycled water
- Expanding recycled water uses
- Reviewing recycled water regulations to ensure streamlined administration, and public health and environmental protection
- Planning efforts and voluntary cooperative partnerships at the local and statewide levels
- Conducting research and studies to address public acceptance, new technologies, and health effects assessments
- Increasing cooperation between agencies to serve recycled water in other agency service areas

Wastewater Disposal in the Service Area

Metropolitan actively promotes the use of recycled water as part of its regional planning strategy. Metropolitan conducted outreach to all reported municipal wastewater agencies within its service area to update the dataset of existing and projected (2045) total dry weather treatment capacities for wastewater reclamation plants, and this is reflected in Table 3-8. However, there were some agencies that opted not to provide updated wastewater treatment capacity information, and therefore, that data was not included in Table 3-8. The projected advanced treatment capacity for 2045, shown in Table 3-8, includes the 150 MGD treatment capacity from the potential Pure Water Southern California program. Some of the larger agencies contacted during this effort include:

- Los Angeles County Sanitation Districts
- Orange County Sanitation District
- City of Los Angeles Bureau of Sanitation

- San Diego Metropolitan Wastewater Department
- Eastern Municipal Water District
- Western Municipal Water District
- Inland Empire Utilities Agency

Wastewater treatment capacity provides an indication of the amount of wastewater being generated and disposed of in Metropolitan's service area. Most wastewater plants in the service area provide secondary treatment, a level of treatment that complies with the Clean Water Act. Inland wastewater treatment plants generally provide treatment to tertiary levels so the effluent may be disposed of in a stream or other water body or for beneficial reuse. A growing percentage of tertiary treated effluent undergoes reverse osmosis or electrodialysis reversal processes, producing high-quality recycled water for groundwater replenishment, industrial uses, or, in some instances, municipal uses.

Table 3-8
Existing and Potential Total Treatment Capacity
Wastewater Reclamation Plants within Metropolitan's Service Area

Treatment Level	Existing Capacity (MGD)	2045 Capacity (MGD)
Primary	2,278	2,435
Secondary	1,985	2,159
Tertiary	849	970
Advanced	165	563

Many small special-purpose wastewater agencies, dual-purpose (water and wastewater) special districts, and municipal wastewater agencies also provide wastewater treatment and disposal services within Metropolitan's service area.

Wastewater is collected in a sewer collection system. From there, it flows to a wastewater treatment plant. Once treated, wastewater may be disposed of through three different mechanisms:

Ocean Outfalls

Treated wastewater is either disposed of directly through an ocean outfall or conveyed to the ocean outfall via a land outfall.

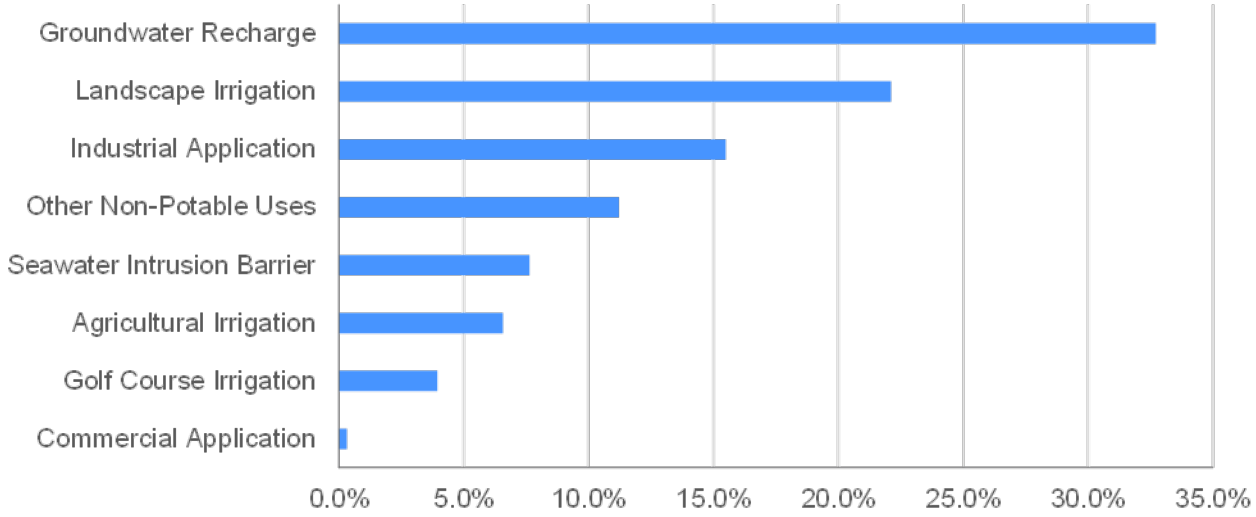
Reuse

According to the State Water Resources Control Board's Volumetric Annual Reporting Open Data Portal, approximately 725 TAF of recycled water were reported as reused in 2024. Within Metropolitan's service area, approximately 455 TAF of recycled water was utilized in 2024 for a variety of purposes, including landscape and agricultural irrigation, industrial processes, and groundwater replenishment. Figure 3-4 shows how recycled water was distributed across these reuse applications within Metropolitan's service area in

2024.

Over 28 percent of the treated wastewater was recycled in 2024 within Metropolitan's service area. Over 1.1 MAF was discharged into surface waters, oceans, or land disposal systems within Metropolitan's service area. Although the majority of treated wastewater is not recycled, as more agencies pursue potable reuse initiatives, competition for source water may emerge as a future challenge on future planning efforts. Indoor conservation may further reduce the volume of wastewater available, potentially limiting both the performance of existing projects and the feasibility of future ones.

Figure 3-4
2024 Recycled Water Use Distribution within Metropolitan's Service Area



Stream Discharge

The majority of inland plants discharge treated effluent into local streams and rivers. That water is then used downstream for beneficial uses, eventually flowing to the ocean. Some of the affected rivers (or ephemeral streams) include:

- Los Angeles River
- Santa Ana River
- Calleguas Creek
- Rio Hondo & San Gabriel Rivers
- Santa Margarita River

Uses of Recycled Water

Water recycling is a reliable water supply, and it helps local agencies comply with environmental regulations. Uses of recycled water can generally be categorized as non-potable, indirect potable for groundwater replenishment or reservoir water augmentation, and direct potable.

Non-Potable Reuse

- Industrial – Industrial users represent a large potential market for recycled water, particularly in heavily industrialized areas, such as the cities of Vernon, Commerce, Industry, and the Wilmington area of Los Angeles. Additionally, refineries in West Basin MWD's service area and the city of Torrance use recycled water. Typical industrial uses include cooling tower makeup water, boiler feed water, paper manufacturing, carpet dying, and process water. Industrial users are high-demand, continuous-flow customers, which allows greater operational flexibility by allowing plants to base load operations rather than contend with seasonal and diurnal flow variations. Because of these operational benefits, industrial users reduce the need for storage and other peak demand facilities and management.
- Irrigation – Recycled water is used to irrigate golf courses, parks, schoolyards, cemeteries, greenbelts, roadway medians, and agricultural purposes throughout Southern California. Using recycled water for irrigation reduces the need for imported water during the critical summer months and in drought situations when water supplies are scarce. Unlike industrial uses, irrigation demands have large seasonal variations in reuse.

Indirect Potable Reuse

Indirect Potable Reuse (IPR) refers to the use of recycled water for groundwater replenishment and reservoir water augmentation purposes. These types of uses require additional treatment levels beyond irrigation uses and the use of an environmental buffer.

- Groundwater Replenishment – Metropolitan's service area overlies numerous groundwater basins, most of which rely on artificial recharge to sustain groundwater production, and some of which are threatened by seawater intrusion. Water agencies along the Los Angeles and Orange Counties coastline inject water into the underlying groundwater basins to create a barrier against this seawater intrusion and protect groundwater quality. The use of recycled water for seawater intrusion barrier projects is increasing and is replacing imported water used for this purpose. Increasing the proportion of recycled water can free imported water for direct consumption. For example, Metropolitan's potential Pure Water Southern California program, a joint venture with the Sanitation Districts, would provide purified recycled water instead of imported water to replenish multiple groundwater basins in the region, making imported water available for other purposes. Table 3-9 presents a summary of this recycled water use.
- Reservoir Water Augmentation – Reservoir Water Augmentation includes the use of advanced treated recycled water to augment a surface water reservoir. The reservoir serves as an environmental buffer (similar to a groundwater aquifer in the case of groundwater replenishment) prior to when recycled water is treated for potable uses. Blended water from the reservoir is then treated at a conventional water treatment plant for potable purposes. The SWRCB adopted the surface water augmentation regulations required under SB 918 in 2018. The City of San Diego was issued the first National Pollutant Discharge Elimination System (NPDES) permit for its reservoir augmentation project in the state. The city completed its Reservoir Augmentation Demonstration Project and is seeking to begin full-scale operation of augmenting Miramar Reservoir, a

source of the city's domestic drinking water supply, with purified water produced at the North City Pure Water Facility by June 30, 2028.

Table 3-9
Recycled Water Use for
Groundwater Replenishment and Seawater Barrier Injection*
(acre-feet per year)

Groundwater Basin	Recycled Water Use
Central Basin	65,000
Chino Basin	16,000
Orange County Basin	102,000
West Coast Basin	7,000
Other Basins	1,000
Total	**191,000**

* 2025 data unavailable during the preparation of the report and were estimated based on the average of 2022-2024. Does not include the Santa Ana River base flow for the Orange County Basin.

Direct Potable Reuse

Direct Potable Reuse (DPR) refers to the use of advanced treated municipal recycled water as a direct supply before or after a conventional water treatment plant. DPR does not require an environmental buffer. There are two distinct forms of DPR: raw water augmentation and treated drinking water augmentation. Currently, there are no permitted DPR projects in California.

Pursuant to Water Code section 13561.2, the SWRCB adopted the uniform water recycling criteria for DPR on December 19, 2023. The proposed DPR regulations were approved by the Office of Administrative Law and incorporated into the California Code of Regulations Title 22 in August 2024, becoming effective on October 1, 2024. Several agencies are conducting DPR pilot projects to demonstrate compliance with the recently approved DPR regulations, evaluate advanced treatment technologies, train operational staff, and facilitate coordination with state regulators. Notable examples include Metropolitan's Napolitano Innovation Center and the City of Los Angeles' Headworks Reservoir Complex DPR Pilot.

- Raw Water Augmentation – Raw Water Augmentation (RWA) refers to the use of advanced treated wastewater as a direct supply before a conventional water treatment plant. Metropolitan is considering RWA as part of the potential Pure Water Southern California program. This DPR option would involve the delivery of advanced treated water upstream of the Weymouth and/or Diemer water treatment plants.
- Treated Water Augmentation – Treated Water Augmentation means the planned placement of recycled water into the water distribution system of a public water system. The recent adoption of regulatory criteria for DPR has offered Metropolitan an opportunity to explore treated water augmentation as part of the potential Pure Water Southern California program.

Metropolitan is currently assessing phasing options that consider both raw and treated water augmentation. Integrating DPR into Metropolitan's existing water treatment and distribution system presents unique challenges and opportunities. Both forms of DPR require research on treatment process selection, water quality, and the hydraulic and operational impacts on distribution systems, whether involving new or existing infrastructure. Planning and design of the pilot/demonstration testing at the Napolitano Innovation Center for the potential DPR treatment trains is in progress.

Technical and Economic Issues of Recycled Water

Recycled water use is growing rapidly in Metropolitan’s service area. Further expansion depends on progress in research, regulatory change, public acceptance, water quality issues, cost, operational issues, and conflicting institutional objectives. Each of these challenges, as well as opportunities for recycled water use, lessons learned, and recommendations to enhance the development of recycled water, is discussed below.

Challenges

Lengthy and Variable Permitting Process

The SWRCB established the Recycled Water Policy (Policy). This Policy requires the SWRCB and the nine Regional Water Quality Control Boards (Regional Boards) to encourage the use of recycled water, consistent with state and federal water quality laws. The Policy provides additional direction to the Regional Boards on appropriate criteria to be used in regulating recycled water projects. The Division of Drinking Water (DDW) and the nine Regional Boards are responsible for setting the rules and permitting for recycled water projects. The timeline and roadmap for getting a permit are challenging and inconsistently implemented in different regions of the state. Limited history and technical information (e.g., on DPR) to inform regulations and limited staffing at DDW and other agencies have challenged the ability to propose, revise, and adopt new regulations in a timely manner. Agencies planning and designing DPR and IPR projects face delays because of regulatory uncertainty. In addition, many project proponents seeking grant or loan funding have identified lengthy CEQA review as a challenge.

IPR projects face regulatory constraints such as treatment, blend water, retention time, and Basin Plan Objectives, which are the designated uses assigned by the SWRCB and which may limit how much recycled water can feasibly be recharged into the groundwater basins. For example, the Basin Plan Objective for TDS of a particular basin may be lower than the quality of the tertiary water effluent available, resulting in the need for more blended water

or advanced levels of treatment. These treatment requirements impact the economic feasibility of a project.

DPR projects face stringent regulatory constraints aimed at ensuring public health and safety. For example, the DPR regulations mandate significant pathogen reduction as compared with IPR projects. In addition to building upon the established IPR treatment train, the DPR regulations require two additional treatment steps: ozone and biologically activated carbon. These processes must be implemented prior to the reverse osmosis stage unless an alternative treatment can be demonstrated as providing equivalent protection to public health. The regulations also mandate extensive monitoring and water quality sampling for chemical constituents and constituents of emerging concern (CECs) at multiple points throughout the process. Operational triggers are required to ensure corrective action is taken if purification performance falls below established minimum thresholds.

Public Perception/Conflicting Messaging

Public acceptance of recycled water is critical in implementing water reuse projects, especially potable reuse projects. In the past, public opposition halted a number of recycled water projects, citing concerns about the source of the water and the resulting water quality.

The public does not have a clear understanding of the difference between non-potable reuse, IPR, and DPR. The public is most familiar with non-potable reuse as they see recycled water in use at parks, golf courses, schools, and other large landscapes. Signage for non-potable reuse projects at parks, schools, and golf courses that reads, “Using recycled water; do not drink,” can adversely affect the public’s acceptance of DPR and IPR, even though IPR has been used in some areas for over 50 years.

With effective outreach, public understanding and acceptance of potable reuse have improved. Projects such as Orange County’s Groundwater Replenishment System conduct tours and presentations to thousands of people, raising awareness of the project, addressing water quality concerns that may be associated with recycling wastewater, and gaining support. Metropolitan’s potential Pure Water Southern California program also involves extensive outreach to the communities impacted by the program.

Education and public outreach are still needed. Any water reuse effort must include public engagement to build awareness of the project and acceptance of recycled water as a new supply.

Cost

Cost, including up-front capital and ongoing operation and maintenance, remains a concern to recycled water development for some agencies. The cost for expanding recycled water distribution systems remains a significant consideration to full implementation of non-potable reuse projects, as these projects require pipelines connecting the treatment plants and the individual users. Some non-potable reuse and IPR projects and all DPR projects require advanced treatment facilities, which are comparatively expensive. Advanced treatment may also require additional concentrate disposal facilities (e.g., a brine line) and extensive infrastructure for injection wells/spreading facilities, or for delivery of the product water to a spreading ground, surface reservoir, or water treatment plant for potable uses.

Metropolitan's potential Pure Water Southern California program would have access to its program partner's existing outfall at the Warren Facility for concentrate disposal. Existing pipelines and feeders could also be utilized to transport purified water for DPR applications. Ultimately, end users play a very important role for recycled water advancement. Site conversion costs (borne by the customer) and additional conveyance infrastructure for new customers can also be significant considerations in reaching full non-potable reuse project capacity. Some agencies may be challenged with cash flow issues or the inability to secure the funding needed to implement projects.

In addition, with the increasing prospect of statewide regulations, some agencies pursuing IPR may be hesitant to extend their existing distribution system for non-potable reuse projects for fear of stranded facilities. Similarly, some agencies pursuing DPR may delay their planned indirect potable reuse projects to prevent stranded distribution facilities.[1]

Source Control and Effluent Water Quality Needs

Source water quality and flow control is essential to help safeguard the water recycling treatment process and the end use of the water by placing controls on the type, timing, and amount of wastewater that comes into the plant. A good source control program limits wastewater treatment plant disruptions and ensures treatment processes are capable of handling spikes in volume, industrial influent, and high salinity influent. When it comes to the treatment process, recycled water policy requires that the effluent meets certain water quality standards. Salt and nutrient management plans protect groundwater beneficial uses and prevent excess degradation, which may limit expanded IPR applications if the agency does not have funds for advanced treatment to remove salts to meet the Basin Plan Objectives. In some cases, existing source control plans may need to be updated to deal with constituents of emerging concern and with more stringent needs of the users.

Source water quality for non-potable reuse can be affected by drought patterns in Southern California. Drought years with low State Water Project allocations will increase potable water salinity and, as a result, increases the salinity of source water for water reclamation plants. High salinity in wastewater decreases the viability of recycled water for irrigation uses and may also cause NPDES discharge violations for local agencies.

The DPR regulations call for the development of a robust source control program that goes beyond the requirements for IPR. Key additions include a comprehensive monitoring program to provide early detection of potential contaminants, the formation of a dedicated source control committee, the implementation of a community outbreak surveillance system, and the expansion of the local limits program to better identify and manage contaminants in wastewater. The Sanitation Districts, Metropolitan's Pure Water Southern California program partner, implement a robust source control program that allows the development of both IPR and DPR applications.

Water use efficiency helps conserve water, but also incidentally reduces wastewater volume resulting in an increase in the concentration of wastewater. As a result, additional treatment is needed, which increases operation and maintenance costs of the system.

[1] Indirect potable reuse projects usually require injection wells or a distribution system to a surface reservoir or recharge basin, and may also require improvements to a surface reservoir, recharge basin, or treatment facility.

Source water quality is especially important for implementing IPR and DPR projects to protect potable water systems.

Operational Issues

While each agency is different, it is important to recognize the possible operational issues that may occur with the use of recycled water, including:

- Reduction in wastewater flows due to ongoing conservation and drought.
- Lack of seasonal storage to address diurnal and seasonal demands; construction of storage facilities may be needed for flow equalization.
- Concentrate disposal needs
- Environmental flow or stream discharge requirements may limit the ability to deliver recycled water during high-demand periods.
- Regulatory issues such as blend requirements and water quality objectives may impact the effectiveness of IPR.
- Need for multiple barriers to ensure recycled water quality and for monitoring techniques that provide feedback in real-time to respond to plant disruptions, especially with DPR projects.
- Need for additional operator training and certification.

Opportunities

Progress Towards New Regulatory Process

The State of California has made progress in developing permit standards that provide opportunities to expand recycled water use.

In December 2023, the SWRCB adopted regulations permitting DPR—the process of recycling treated wastewater directly into drinking water supplies without the need for environmental buffers like groundwater basins or reservoirs. These regulations, effective October 1, 2024, established stringent treatment and monitoring requirements to ensure public health protection.

Pursuant to California Water Code Section 13558, the SWRCB is developing regulations for the on-site treatment and reuse of non-potable water in multifamily residential, commercial, and mixed-use buildings. These regulations aim to establish risk-based water quality standards for systems that treat and reuse water sources like graywater, rainwater, and blackwater for non-potable applications such as toilet flushing and landscape irrigation. The Notice of Proposed Rulemaking was released in March 2025, and the SWRCB adopted the proposed regulations for onsite non-potable water reuse on November 18, 2025. The SWRCB staff continues finalizing the regulatory package for the adopted regulations.

Introduced in 2024, SB 1121 seeks to expedite the local permitting process for onsite treated non-potable water systems. The bill mandates that local jurisdictions approve permits for such systems within 60 days of application submission, provided the project meets or exceeds the SWRCB's water quality standards.

In alignment with California Water Code Section 13521.2, the SWRCB is updating the Title 22 Water Recycling Criteria to incorporate provisions from the Cross-Connection Control Policy Handbook, including backflow prevention measures for dual-plumbed systems, such as provisions for the use of swivel or changeover devices.

SB 31, signed into law in 2025, introduces clarifications and expansions to California's recycled water statutes. The bill redefines recycled water to better align with current uses and treatment technologies, helping to streamline permitting and regulatory consistency. SB 31 specifies that discharges from decorative bodies of water during storm events are not to be classified as unauthorized discharges, provided that the water level in the feature was restored using recycled water to compensate for evaporation. This distinction is important for water features maintained with recycled water, ensuring compliance with waste discharge permits during periods of heavy rainfall. In addition, the bill clarifies that homeowners' associations are explicitly authorized to use recycled water for landscape irrigation of common outdoor spaces and protects them from having to install new plumbing systems when using recycled water, reinforcing recycled water's role in sustainable urban landscaping. The bill will also allow food handling and processing companies to use recycled water for toilets and urinals or for outdoor irrigation under certain conditions. These provisions aim to encourage broader and more practical applications of recycled water in residential and aesthetic settings, supporting statewide conservation goals.

Metropolitan continues to work with the WateReuse Association and other agencies on legislative and regulatory issues to streamline permitting processes and to provide needed funding and support for increased use of recycled water.

New Funding Opportunities

Proposition 1 provided $625 million for water recycling projects. Grants and loans for planning and construction are administered through the SWRCB's Water Recycling Funding Program. An additional $100 million was available through DWR for desalination.

Proposition 13, approved by voters in 2000, is also used to fund grants and loans for planning and construction of recycled water projects. Repayment of low-interest loans from previous projects allows limited funding from this program to continue.

Proposition 68, approved by voters in 2018, has released substantial funding post-2020. It authorized $4.1 billion in general obligation bonds for water, park, and natural resource investments, including $250 million for sustainable groundwater and water recycling projects.

The Clean Water State Revolving Fund (CWSRF) provides low-interest loans to public agencies for planning, design, and construction of water recycling projects. In response to California's prolonged drought, DWR launched a $300 million Urban Community Drought Relief Grant Program in 2022-2023, with allocations from the state's budget and federal relief funding. A portion of this program focuses on recycled water and water supply diversification.

The Large-Scale Water Recycling Program (LSWRP) was established by USBR under the Bipartisan Infrastructure Law (BIL) enacted in 2021, with the first round of $180 million released in 2023. The program provides competitive funding to large-scale water recycling projects that can produce at least 10,000 AF of water per year and serve multiple users. It

has committed up to $450 million over five years for eligible projects. In Southern California, this program has funded several landmark initiatives. Notably, Pure Water Southern California, a joint project between the Metropolitan and the Sanitation Districts, was awarded $99.2 million in 2023 and an additional $26.3 million in 2024. Additional funds are available in 2025. The Water Infrastructure Finance and Innovation Act (WIFIA) program was authorized by the Water Resources Development Act of 2014. The program is similar to the State Revolving Fund programs like the CWSRF program, but is intended to provide federally subsidized low-interest loans for up to 49 percent of large regional projects. The WaterSMART Title XVI program, administered by USBR and authorized under the Water Infrastructure Improvements for the Nation (WIIN) Act of 2016, continues to receive annual appropriations, with increased funding post-2020 due to the BIL. Title XVI supports planning, design, and construction of water reuse projects. In 2022 and 2023, this program provided $30 million to California projects. The Pure Water Southern California program was awarded $5 million in 2024.

In 2014, Metropolitan increased the financial incentives under its LRP for agencies to develop recycled water. In 2022, Metropolitan also increased the financial incentives for the On-site Retrofit Pilot Program which provides rebates to customers who convert their irrigation and industrial systems from potable water to recycled water. In addition, Metropolitan established the Reimbursable Services Program to provide technical and construction assistance to its member agencies for local project development. Under this program, Metropolitan advances funds and is reimbursed by the agency.

Improving Public Perception

Recent droughts have heightened water awareness in the region and have provided momentum for water conservation and reuse. The public is more willing to accept alternative supplies such as recycled water. Extensive public outreach and education have also helped improve the public's perception of recycled water. Public sharing of information, open-door stakeholder meetings, and focus groups have been very effective at distributing information and addressing public concerns. Case studies and demonstration projects are used to educate and improve public acceptance of recycled water.

Agencies are working together to share best practices for public outreach, create consistent messaging, simplify water reuse terminology, and ensure effective communications with the public. One such group is the WateReuse California Communications Collaborative Group, which provides a forum to discuss and collaborate on water reuse communications. The group offers resources for communications professionals, including a terminology document to provide consistent and simple water reuse terminology for use with the public.

New Technologies, Research, and Information Sharing

New technologies, research, and information sharing greatly enhance the development of recycled water. Programs such as Metropolitan's Future Supply Actions (FSA) Funding Program focus on technical studies and pilot projects that reduce barriers to future local production. Projects under this program include optimizing new treatment techniques for recycled water, exploring new monitoring methodologies, and testing innovative brine concentration technology. In addition to the technical portions of this program, the FSA Funding Program supports collaboration between agencies and regional sharing of information.

Metropolitan is also conducting cutting-edge research at the Grace F. Napolitano Pure Water Southern California Innovation Center. The demonstration facility is testing the effectiveness of membrane bioreactors, followed by reverse osmosis and ultraviolet disinfection/advanced oxidation in the advanced water treatment process. During testing, Metropolitan and the Sanitation Districts are analyzing water quality for the removal of various contaminants, especially microorganisms. The agencies are also working closely with state regulators and an independent scientific advisory panel to oversee the work. Once regulators approve the process, it may be used throughout California. Additional research on membrane bioreactors and potential purification processes to integrate potential raw water or treated water augmentation projects for DPR are also planned at the demonstration facility. The studies will help further potable reuse in California and across the globe.

Regional studies can also examine the needs of multi-jurisdictional areas and foster communication among agencies to promote the use of recycled water. For example, sharing regional information such as GIS data can identify areas of recycled water surpluses and needs.

Partnerships

Drinking water, wastewater, and groundwater management agencies share some common objectives, including access to source water, cost minimization, and protection of the environment. Many agencies are successfully cooperating and developing recycled water projects. These partnerships can allow sanitation districts to reduce the cost of disposing treated wastewater in the ocean, reduce impacts to the marine environment, and provide a source of reclaimed water to water agencies for recycling. At the same time, groundwater basin management agencies could be the recipients of final recycled water, helping maintain or increase groundwater levels.

Lessons Learned

There have been many success stories on recycled water development. Focusing on public outreach and education has improved public perception. Partnerships and joint efforts among water and wastewater agencies proved to be an effective way to remove barriers and make progress. Numerous studies and research funded by federal, state, and local agencies are benefiting local and regional efforts.

Public Outreach is Important

Public outreach and education have helped improve the public's perception of recycled water. Both experience and research have shown that when the public is informed and takes part in the decision-making process, they will likely accept and support recycled water as a new supply in their community.

Water shortages raise awareness for alternative ways to conserve. As a result, the public is more willing to accept alternative supplies such as recycled water, support the more expensive projects, and tolerate rate increases. Potable reuse projects throughout Southern California are advancing due to this increased public awareness and support. Non-potable reuse is also increasing. Some residential property owners are interested in using recycled water for watering plants to help with the drought. For example, residents have access to recycled water from residential recycled water fill stations in the Irvine

Ranch Water District. Programs like these improve public acceptance of recycled water, increase recycled water use, and conserve potable supplies.

Standard practice for water reuse projects now includes robust outreach. Many projects dedicate considerable resources towards public engagement. For example, Metropolitan's Pure Water Southern California Program features a learning center at the Napolitano Innovation Center to provide a platform for public outreach. The facility and learning center are used to conduct tours, introducing the public to the program and a potential new source of water.

Additional Funding is Needed

LRP incentives and onsite retrofit program funding have increased the use of recycled water in the region. However, incentives alone may not be enough to spur project development—capital funding is also necessary because the LRP pays for project performance; in other words, it provides funding after a project begins operation. Metropolitan increased its LRP incentive rate in 2014, and also offers three options for an agency to receive funding. Agencies select the option that allows the project to receive incentives when they are needed, recognizing the higher costs borne by the agency and lower cost recovery at the start of operation. One source of funding is typically not enough to fund a recycled water project which generally requires a local match for grant funding.

Partnerships Can Be Successful

History shows us that partnerships among agencies help advance the use of recycled water and provide tangible benefits to each participating agency. A good example of partnerships working well is the agreement between the Orange County Water District (OCWD) and the Orange County Sanitation District. This partnership began in the 1970s, when OCWD built the Water Factory 21 to produce recycled water to mitigate seawater intrusion in the Orange County Groundwater Basin. Twenty years later, the two agencies decided to jointly build the Groundwater Replenishment System recycled water project, the largest IPR facility in the world.

Other examples of cooperation between agencies to further recycled water use include partnerships between the City of Los Angeles and West Basin Municipal Water District (West Basin Water Recycling Program), the City of Los Angeles and the City of Burbank (North Hollywood Water Recycling Project), City of Long Beach and the Water Replenishment District (Alamitos Barrier Water Recycling Project), and the Sanitation Districts and Central Basin Municipal Water District (Century and Rio Hondo Water Recycling Project).

In addition, Metropolitan and the Sanitation Districts have been in partnership since 2009 to develop a regional recycled water project for groundwater replenishment and raw or treated water augmentation. Pure Water Southern California would produce up to 150 MGD of purified water from the Warren Facility in Carson. As a first step toward full implementation, Metropolitan and the Sanitation Districts cooperated to complete the Napolitano Innovation Center in 2019. The Advanced Purification Center is a 0.5-million-gallon-per-day demonstration facility that is generating information needed for the potential future construction of a full-scale recycled water facility. It uses a unique application of membrane bioreactors designed to significantly increase efficiency in water recycling. Scientists and

engineers are testing the process, utilizing full-scale treatment modules, to ensure the resulting purified water meets the highest water quality standards. Once approved by regulators, this innovative process could be used throughout California and even applied around the globe. Please see below under “Pure Water Southern California” for more information.

Metropolitan is also in partnership with many other organizations to collaborate on this program. Potential recipients of the water, such as groundwater basin managers and member agencies, are partners. The Southern Nevada Water Authority, Central Arizona Project, and Arizona Department of Water Resources are also partners, collaborating on how the project could support Colorado River water use. Metropolitan is also partnering with LADWP to work together to develop recycled water. The City of Los Angeles’ Pure Water Los Angeles program to reuse wastewater from the Hyperion Water Reclamation Plant is also a key project in development and could provide a potable supply for the region.

Water Industry Organizations and Regional Collaboration Help Advance Recycled Water

Advancements to recycled water development are due, in large part, to cooperation and collaboration among water and sanitation districts, as well as other water industry organizations. Historically, the WateReuse Association was one of the main advocates for recycled water development in the state. Their activities initially focused on permitting issues, public outreach/education, conferences for information sharing, and research related to recycled water. As recycled water became a core resource for water and wastewater agencies, they started to ramp up their activities to help advance recycled water and utilized partnerships with academia, along with other trade organizations such as the Association of California Water Agencies, California Urban Water Agencies, WateReuse Association, and California Association of Sanitation Agencies. Professional organizations such as the American Water Works Association are another vehicle to promote recycled water through research, technical seminars, and operator training and certification. The WateReuse Association helped develop the National Water Reuse Action Plan (WRAP), a project of the USEPA with federal agency and water sector partners to develop bold actions that accelerate the adoption of water recycling through integrated and collaborative water resources planning. These organizations have proven to be effective in promoting regional collaboration on research and leveraging resources. The Southern California Water Coalition (SCWC) has launched the Recycled Water Task Force with the goal of addressing barriers, gaining acceptance, and educating stakeholders on recycled water.

Groundwater Recovery

Southern California groundwater basins may experience varying degrees of water quality challenges as a result of urban and agricultural uses. The accumulation of high-salinity water and degradation from volatile organics are two common constraints to the economic use of groundwater for urban applications. In some cases, the threat of increased salt buildup can also complicate conjunctive use of groundwater basins and imported supplies.

Use of degraded groundwater normally requires high levels of treatment. Membrane processes used to recover severely degraded water have a high capital cost and incur a high operational cost for power. Once treated, however, recovered groundwater may be

integrated into potable water systems. Metropolitan initiated its Groundwater Recovery Program (GRP) in 1991 to encourage local agencies to treat and use degraded groundwater for municipal purposes. The GRP was open to all technologies that recovered and used degraded groundwater. The GRP was retired in 1998 and folded into Metropolitan's LRP.

Seawater Desalination

The constant availability of ocean water regardless of weather or climate is one of the key benefits of seawater desalination. Countries with arid or Mediterranean climates and/or growing populations with developing economies have embraced seawater desalination as a drought and climate-resistant option for meeting water needs. In the past 30 years, water agencies in Australia, Spain, Singapore, Hong Kong, India, China, Israel, and other countries throughout the Middle East have implemented large-scale seawater desalination plants in response to droughts and to meet growing demands. Within Southern California, the San Diego County Water Authority, the City of Santa Barbara, and communities on Catalina Island have supplemented their water supplies with seawater desalination.

Seawater desalination projects provide unique benefits as part of a diversified water resource portfolio. In California, they also present unique development challenges compared to other alternative resources. Table 3-10 provides a summary of the primary benefits and challenges:

Table 3-10
Summary of Benefits and Challenges of Seawater Desalination Projects

Benefits	Challenges
• Highly reliable potable supply resistant to weather variations and climate change • Low salinity, high-quality resource improves supply blends and supports reuse • Locally controlled • Does not affect and is not affected by upstream or downstream water rights – truly a new supply • Located near coastal population centers • Supports Southern California's desalination industry cluster and innovation centers	• Historically expensive due to high energy use and capital costs, although recent advancements have made seawater desalination more comparable to other new alternative water supply options. • Potential marine life impacts • Local community and environmental opposition • Permitting uncertainty and development risk • Energy intensive and thus increased exposure to energy rate uncertainty • Demand risk in wet years, similar to other alternative supply projects

Metropolitan and its member agencies have been considering seawater desalination as a potential new supply source since the 1960s. Up until the 1990s, seawater desalination was considered expensive compared to other resource alternatives, especially imported water. Advances in membrane technology, energy recovery, and process design in the 1990s lowered desalination costs compared to other new supply alternatives.

By the early 2000s, several member agencies began pursuing local projects to diversify their resource portfolios. In 2001, Metropolitan created an incentive program, the Seawater Desalination Program (SDP), to support these projects. Soon after, the Board approved Metropolitan's role as a regional facilitator for seawater desalination with the purpose of assisting the member agencies with state and regional development issues. Metropolitan

signed SDP agreements with the City of Long Beach, MWDOC and West Basin MWD in 2006. In 2014, Metropolitan merged seawater desalination projects into the LRP to promote the development of additional local supplies in the region. Metropolitan's SDP agreements with the three member agencies expired in June 2020. In April of 2024, the Metropolitan Board approved a $39.9 million LRP agreement with MWDOC and South Coast Water District (SCWD) for the 5,600 AFY Doheny Ocean Desalination Project.

In order to protect California's coastal and marine resources, seawater desalination projects in the state must meet stringent environmental regulations. Relevant regulations include the California Ocean Plan and Marine Life Protected Area restrictions. Additionally, projects located near coastal generating stations are affected by the California's Once-Through Cooling regulations. Each of these is discussed below:

Ocean Plan Regulations

In May 2015, the SWRCB updated California's Ocean Plan with regulations for new seawater desalination projects. The regulations include requirements for ocean water intakes, outfalls, brine discharges, mitigation, monitoring, and permitting. Regional Water Quality Control Boards are responsible for implementing the regulations and have broad powers over project design elements.

Marine Life Protected Areas

In 2011, the California Department of Fish and Wildlife adopted a system of 50 Marine Life Protected Areas (MLPAs) covering approximately 15 percent of Southern California's coastline. MLPAs are defined zones along the coast where certain commercial and recreational activities are restricted. Most construction and operational activities associated with seawater desalination are prohibited in MLPAs with the exception of certain types of subsurface intakes. MLPAs are located along the Channel Islands, the mainland coast, and locations surrounding the Channel Islands. The MLPA network includes areas near planned seawater desalination projects. In October 2020, Governor Newsom announced a 30 percent by 2030 initiative. The initiative calls for preserving 30 percent of California's lands and coastal waters by 2030. Implementation of the initiative may increase MLPAs within Southern California's coastal waters and could affect potential sites for seawater desalination projects. Additional MLPAs may also provide marine life mitigation opportunities for potential projects.

Once-Through Cooling Regulations

Prior to the revised Ocean Plan regulations, the SWRCB in 2010 adopted regulations requiring coastal power plants to phase out the use of once-through-cooling (the use of seawater to cool generators in a single-pass system) by 2030. As once-through-cooling is phased out, many of the environmental and operational benefits of co-locating seawater desalination projects with coastal power plants have been diminished. However, coastal power plants remain attractive sites for development due to the presence of coastal-dependent industrial zoned land, power infrastructure, and the potential to repurpose existing infrastructure.

Seawater Desalination Siting and Streamlining Report to Expedite Permitting

In December 2023, the SWRCB released the Seawater Desalination Siting and Streamlining Report to Expedite Permitting. The report responded to the following mandate

in the governor's 2022 California Water Supply Strategy: Adapting to a Hotter, Drier Future: "The State will help streamline and expedite permitting to provide better clarity and certainty to further desalination projects. To this end, by June 30, 2023, the State Water Board, Coastal Commission, DWR, and other State entities will develop criteria for siting of desalination facilities along the coast and recommend new standards to facilitate approval."

This report was prepared by the Seawater Desalination Interagency Group, which includes various regulatory agencies involved in overseeing the permitting of seawater desalination projects in California. It provides a comprehensive overview of the regulatory framework and the roles of each agency in the permitting process. While the report does not introduce new regulatory requirements, it establishes a pathway for a more efficient and streamlined permitting process through concurrent review—a coordinated approach that allows agencies to review applications simultaneously. To qualify for the streamlined permitting process, a project must meet the following requirements:

- Concurrent Review – Submit applications to all relevant agencies at the same time and coordinate joint meetings.
- Hydrogeologic Siting – Use subsurface intakes that either exclusively withdraw seawater or improve seawater intrusion.
- Brine Discharge – Evaluate opportunities to dilute brine using treated wastewater otherwise discharged to the ocean.
- Minimizing Marine Life Mortality – Avoid siting projects within or near Marine Protected Areas (MPAs) or State Water Quality Protection Areas (SWQPAs).
- Coastal Hazards – Plan for foreseeable hazards, including sea level rise, climate change, and seismic risks.
- Mitigation – Provide and implement full mitigation for construction and operational impacts before the facility begins operation.
- Water Resource Management and Need – Design projects to meet anticipated water demand, considering all reasonable alternatives.
- Environmental Justice – Avoid, minimize, and mitigate potential impacts to disadvantaged communities.
- Tribal Consultation – Begin early and ongoing consultation with Tribal Nations throughout project development.
- Energy Efficiency – Employ technologies that enhance energy efficiency and reduce climate and pollution impacts.

Changed Conditions

The status of locally planned projects changes from year to year. Metropolitan regularly surveys its member agencies for planned projects to develop local supply projections and coordinate water planning efforts. Recent changes in long-term strategies, regulations, and funding priorities could provide new opportunities to develop these resources.

Recycled Water

Several recent state policies and adopted codes help recycled water development as described below.

In December 2023, the SWRCB adopted regulations for DPR, allowing treated wastewater to be introduced directly into drinking water systems without the need for environmental

buffers like reservoirs or aquifers. These regulations, effective October 1, 2024, establish stringent treatment and monitoring requirements to ensure public health protection. The DPR framework mandates advanced multi-barrier treatment processes capable of removing all pathogens and viruses, even those not detected in the source water. This initiative positions California as a leader in water reuse, providing a consistent regulatory pathway for utilities to develop DPR projects and enhancing the state's water supply resilience.

In August 2022, Governor Newsom released California's Water Supply Strategy: Adapting to a Hotter, Drier Future, setting ambitious goals to increase recycled water use. The strategy aims to recycle at least 800,000 AF of water per year by 2030 and 1.8 MAF by 2040, focusing on redirecting wastewater discharges currently going to the ocean. This plan underscores the state's commitment to expanding recycled water infrastructure to meet future water demands.

In alignment with California Water Code Section 13521.2, the State Water Board is updating the Water Recycling Criteria (Title 22) to incorporate provisions from the Cross-Connection Control Policy Handbook, including backflow prevention measures for dual-plumbed systems. The first regulatory package, addressing these updates, was completed in 2024 as a "Changes Without Regulatory Effect" filing. Subsequent packages will address additional clarifications and updates to the criteria, with timelines to be determined. Enacted in 2023, SB 31 redefines recycled water and clarifies its permissible uses. Notably, the bill specifies that discharges from decorative bodies of water during storm events are not considered unauthorized discharges if recycled water was used to restore levels due to evaporation. Additionally, SB 31 affirms that homeowners' associations are authorized to use recycled water for landscape irrigation of common outdoor spaces. These provisions aim to encourage broader and more practical applications of recycled water in residential and aesthetic settings, supporting statewide conservation goals.

Groundwater Recovery Brine Disposal

The management of existing regional brine lines and the development of new brine line systems will be a critical factor in the continued growth in brackish groundwater desalination. Brine lines will also be applicable for disposing of brine from advanced treatment of wastewater for recycled water use. All processes that recover degraded groundwater also produce concentrated waste flows for which disposal can be problematic. Most importantly, membrane processes such as reverse osmosis—the predominant desalting technology used in Southern California—produce significant volumes of brine that can account for about 15 percent of the treated water. In Southern California, brines generated from brackish water desalination are typically disposed of through dedicated brine lines to ocean outfalls or sanitary sewers.

The region currently has two operating brine lines: the Santa Ana Regional Interceptor (SARI line) and the Calleguas Regional Salinity Management Pipeline. The SARI line collects brine from desalters in San Bernardino, Riverside, and Orange Counties and discharges to a treatment plant operated by the Orange County Sanitation Districts (OCSD), with final discharge through the OCSD ocean outfall. A key benefit of the SARI line is that it has allowed inland water agencies to recover impaired groundwater resources which would otherwise be unusable.

A lower portion of the Calleguas Regional Salinity Management Pipeline is in operation while the upper reach is still under construction. The Calleguas Regional Salinity Management Pipeline delivers brine from recycled water plants and groundwater desalination facilities in Ventura County to the ocean.

Construction of a third regional line is underway for Pure Water San Diego's Phase 1 for the City of San Diego. The brine line will carry the brine from the North City Pure Water Facility to the Point Loma Wastewater Treatment Plant. The Southern California Salinity Coalition, a coalition of water and wastewater agencies, has advocated for state and federal financial assistance to build these regional brine lines.

Seawater Desalination

Changed conditions for seawater desalination include sustained operations of the Carlsbad Seawater Desalination Plant, approval of the Doheny Ocean Desalination Project, state and federal funding opportunities, and the release of SWRCB's Seawater Desalination Siting and Streamlining Report to Expedite Permitting.

Carlsbad Desalination Plant Operations and Ownership

In 2015, the San Diego County Water Authority (SDCWA) started taking delivery of supplies from the Claude "Bud" Lewis Carlsbad Desalination Plant (Carlsbad Plant). The Carlsbad Plant is the largest seawater desalination plant in the United States, with a capacity of 50 MGD, or 56 TAF per year. SDCWA developed the Carlsbad Plant under a Public-Private Partnership with Poseidon Resources Inc. In 2019, ownership of the plant was purchased by Aberdeen—a global infrastructure investment firm. Aberdeen established Channelside Water Resources, which now manages the daily operations of the plant. Production from the plant is guided by a Water Purchase Agreement which specifies minimum and maximum purchases and also determines the price SDCWA pays for the supplies from the plant. All provisions of the Water Purchase Agreement are still in place. Table 3-11 shows production from the Carlsbad Plant since 2020.

Table 3-11
Claude "Bud" Lewis Carlsbad Seawater Desalination Plant Production

Calendar Year	Production (AF)
2024	22,000
2023	46,000
2022	47,000
2021	50,000
2020	41,000

Source: San Diego County Water Authority

Doheny Ocean Desalination Project

The 5,600 AF per year Doheny Ocean Desalination Project (Doheny Project) in south Orange County is currently in the design phase and is anticipated to be online in 2030. The Doheny Project is being pursued by the South Coast Water District (SCWD) in Orange

County and was authorized into Metropolitan's LRP. Once operational, the Doheny Project will be the first fully compliant ocean desalination facility to use the California Ocean Plan Amendment's preferred subsurface intake and blended brine discharge. SCWD has obtained all of the major permits required for the project.

State and Federal Funding Opportunities

Several state and federal funding opportunities exist to promote the development of seawater desalination projects. Within California, the DWR provides funding through the Water Desalination Grant Program. DWR taps limited funds for the Grant Program from Proposition 1 and, in the past, from Proposition 50. As of May 2024, the Grant Program has funded over $123 million in grants for 65 projects. The program funds new construction, demonstration projects, and research studies. It also covers brackish water desalination projects. In 2018, DWR converted the program to a continuous application process.

Federal funding for desalination projects includes programs administered by USBR and the Department of Energy (DOE).

USBR promotes desalination through its Desalination and Water Purification Research Program (DWPRP). Under DWPRP, USBR funds research, pilot tests, and demonstration projects to improve technologies for desalination and brine management. Program goals include reducing desalination costs, energy use, and environmental impacts. USBR operates the Brackish Groundwater National Desalination Research Facility and other desalination technology testing laboratories as part of the program. Several member agencies have received DWPRP grants for local desalination projects.

DOE established a Water-Energy desalination hub called the National Alliance for Water Innovation (NAWI). NAWI's focus is to accelerate the development of early-stage desalination technologies in order to lower desalination's costs and energy use. Led by Lawrence Berkeley National Laboratory, NAWI is a consortium of national laboratories, university researchers, private companies, and water industry stakeholders, in which Metropolitan is a member of. DOE initially funded NAWI with $100 million over a five-year period starting in 2020. In April 2024, DOE announced renewed funding for NAWI with $75 million over 5 years for the second phase. While the focus of NAWI is early-stage pre-commercial technologies, water agencies have opportunities to participate in research projects and pilot tests. Water agencies also help guide NAWI's research agenda.

Seawater Desalination Siting and Streamlining Report to Expedite Permitting

In December 2023, the SWRCB released the Seawater Desalination Siting and Streamlining Report to Expedite Permitting. The report was prepared by the Seawater Desalination Interagency Group, which includes various regulatory agencies involved in overseeing the permitting of seawater desalination projects in California. It provides a comprehensive overview of the regulatory framework and the roles of each agency in the permitting process. While the report does not introduce new regulatory requirements, it establishes a pathway for a more efficient and streamlined permitting process through concurrent review—a coordinated approach that allows agencies to review applications simultaneously. To qualify for the streamlined permitting process, a project must utilize subsurface intakes such as slant wells, use co-mingled discharge, and be proactive in engaging with all stakeholders, among other requirements outlined in Section 3.5.

Implementation Approach

Local Resources Program

The Local Resources Program (LRP) is the primary tool for Metropolitan to incentivize local resources development. The success of the LRP is due to its adaptability to changed conditions. Since its inception in 1982, Metropolitan and its member agencies periodically review and update the LRP in response to water supply conditions.

In October 2018, Metropolitan's Board authorized an interim program target of 170 TAF of new local supplies since the program target established in 2007 of 174 TAF was nearly subscribed. The executed agreements, in combination with submitted and proposed LRP applications, exceeded the remaining program capacity under the 2007 LRP target. By establishing an interim target, Metropolitan continues to encourage and support development of local supplies. The interim target may be revised as long-term planning analysis are updated.

The current LRP offers three incentive options. The first option is an incentive of up to $340/AF for 25 years of produced local supplies. The second option is an incentive of up to $475/AF for a 15-year payment, but the project is required to produce local supplies for 25 years. The third option is a fixed amount of up to $305/AF for 25 years.

On-Site Retrofit Program

Metropolitan continues to explore ways to help increase recycled water use. In order for a site to receive recycled water, the potable water systems must be retrofitted for recycled water use. In July 2014, to catalyze an increase in recycled water use, Metropolitan established the On-site Retrofit Program to provide financial incentives directly to public or private property owners to convert potable water irrigation or industrial water systems to recycled water service. The goal of this program is to alleviate some of the costs borne by property owners to retrofit their sites. The program offers a rebate of up to $195/AF for ten years of estimated water savings, capped at actual retrofit costs. Eligible items include retrofit costs related to project design, permitting, construction, connection fees, and required recycled water signage. The program currently has an annual budget of $3 million and is accepting applications on a first-come, first-served basis until funding is exhausted.

Stormwater Pilot Programs

Metropolitan's 2015 IRP Update called for the development of a diverse resource portfolio through local supply projects – including recycled water, groundwater recovery, seawater desalination, and stormwater capture. Metropolitan has played an active role in the development of those local supplies through different approaches and programs developed over the years. Since 1982, Metropolitan has provided incentives to its member agencies to develop local projects through the LRP. Local stormwater capture projects currently are not funded through the LRP in part due to the need to have a better understanding of the connection between captured stormwater and yield.

In 2018, the SCWC published a white paper that detailed benefits and challenges associated with stormwater development. Although stormwater projects deliver multiple benefits, such as supply yield, flood mitigation, habitat creation, and water quality improvements, some of the main challenges with developing stormwater projects are related to costs, metering, data collection, and water supply yield. The relationship between

stormwater capture and yield has not been extensively analyzed. In addition, most projects do not demonstrate a direct link to increased groundwater production or yield. This limits the ability to fully characterize stormwater capture project costs or to quantify the water supply benefit.

To better understand the actual costs and potential benefits associated with stormwater capture, yield, and reuse, Metropolitan developed two Stormwater Pilot Programs. The Direct Use Pilot Program aims to develop costs and benefits associated with capture and direct reuse of stormwater. Under this pilot, projects are required to capture stormwater onsite or through storm drain diversion. In addition, projects must meter both captured and reused stormwater. The Recharge Pilot Program was initiated to further examine the relationship between stormwater capture and yield. The Recharge Pilot Program requires participants to measure both stormwater capture and how much of the captured water reaches the primary pumping and subsequently allows for increased groundwater production or yield. Proposed methods for measuring how stored water recharges the primary pumping aquifers must use at least one physical method and one modeling method. This program will help collect data to better understand how stormwater recharge affects usable groundwater. Both programs provide funding for new construction and installation of monitoring equipment. Additionally, both programs provide funding for collecting three years of monitoring data. The Direct Use Pilot Program launched in January of 2020 with a $5.0 million budget, while the Recharge Pilot Program launched shortly after in March 2020, with a budget of $7.5 million.

The data collected from the pilot programs will provide a better understanding of stormwater projects and their performance. Providing funding to offset construction and monitoring costs alleviates a key constraint in project development and the ability to quantify stormwater volumes. Furthermore, the data collected from the pilot programs will help evaluate the water supply benefits delivered by stormwater projects and provide a basis for potential future funding approaches.

Pure Water Southern California Program

The potential Pure Water Southern California program, a partnership with the Sanitation Districts, would purify wastewater that currently flows to the ocean to produce high-quality water that could be used again. On November 10, 2015, Metropolitan's Board authorized Metropolitan to enter into an agreement with the Sanitation Districts to implement a demonstration-scale recycled water treatment plant and to establish the framework of terms and conditions for development of a regional recycled water supply program. Under this agreement, Metropolitan has the opportunity to work collaboratively with the Sanitation Districts to develop a potential regional recycled water supply program that would purify and reuse water. Metropolitan and the Sanitation Districts are jointly developing this program to purify effluent from the Sanitation Districts' Warren Facility using advanced treatment technologies to produce water that is near-distilled in quality, and that would be equal to or better than the quality of water currently used to replenish groundwater basins in the Southern California region. The purified water would be delivered to Metropolitan's member agencies to meet their groundwater replenishment and storage requirements. A collaboration between the two districts could advance the reuse of water at a scale, timing, and strategic location to serve the direct needs of multiple member agencies for recharge of groundwater basins in Southern California, and to augment regional supplies for

Metropolitan's service area. In addition, with the development of regulations for raw water augmentation, purified water may eventually be blended with imported supplies at Metropolitan's treatment plants and delivered to additional member agencies.

In October 2019, the agencies began operating the Napolitano Innovation Center, a 0.5 MGD demonstration facility. The facility will generate information needed for the potential future construction of a full-scale advanced water plant. It uses a unique application of membrane bioreactors designed to significantly increase efficiency in water recycling. Scientists and engineers will test the process, utilizing full-scale treatment modules, to ensure the resulting purified water meets the highest water quality standards. Once approved by regulators, this innovative process could be used throughout California and even applied around the globe. Following approval, additional treatment trains will be tested to determine the needed purification processes for a full-scale program.

The full-scale program could produce up to 150 million gallons daily, enough to serve more than 500,000 homes. Purified water from the advanced treatment facility would be delivered through 60 miles of new pipelines to the region's groundwater basins, industrial facilities, and potentially two of Metropolitan's treatment plants. Metropolitan prepared feasibility analyses for the Pure Water Southern California program (the Feasibility Study, Report No. 1530) in November 2016 and Conceptual Planning Studies Report (Report 1618, February 21, 2019) in preparation for environmental review and preliminary design. Letters of intent have also been executed with key partners. The project still needs assessment and approval by Metropolitan's Board for implementation and design, including staging and size.

In November 2020, Metropolitan's Board of Directors approved the next phase of the program, environmental planning. In addition, the Board also approved an updated agreement with the Sanitation Districts, which further expands the partnership and allows for additional shared responsibilities and resources. Metropolitan and the Sanitation Districts are continuing to move forward with the program by completing the conceptual planning and the Draft Environmental Impact Report (EIR) with EIR certification anticipated in early 2026, continuing demonstration testing, participating in the CAMP4W assessment, and coordinating member agency agreements.

Future Supply Actions

Metropolitan supports the development of local supplies through the FSA Funding Program. FSAs are low-cost, low-risk investments Metropolitan can take now to remove barriers to new supplies so that they can be accelerated in the future, if and when needed. The FSA Funding Program is Metropolitan's primary vehicle for promoting innovative new approaches to local supply development. Under the FSA Funding Program, Metropolitan funds member agency studies addressing development challenges for groundwater, recycled water, stormwater, and seawater desalination supplies. The goals of the FSA Funding Program include:

- Reduce barriers to future resource production.
- Provide results that are unique, yet transferable to other areas in the region.
- Advance the field of knowledge.
- Represent a critical path to water resource implementation.

The FSA program is currently in its third round of funding, following an initial round in 2013 and a second round in 2018. This program helps fund a mix of white papers, pilot tests, and demonstration studies for groundwater, recycled water, stormwater, and seawater desalination. The program funds a maximum of $500,000 per study or per agency. Metropolitan has provided financial support to 34 studies at $6.5 million for the first and second rounds of the program and is supporting seven studies for up to $2.7 million in the current round. A summary of program funding is shown in Table 3-12.

Table 3-12
2023 Future Supply Actions Funding Program Awards

Proposal Name	Metropolitan Funding Match	Lead Member Agency	Status
Groundwater			
Identifying and Removing PFAS Used in Well Drilling	$207,500	Inland Empire Utilities Agency	Ongoing
Groundwater Augmentation, Groundwater Collection System, and New Wells Site Study	$499,802	City of Long Beach	Ongoing
Recycled Water			
Chino Basin Advance Water Purification Demonstration Facility	$401,500	Inland Empire Utilities Agency	Ongoing
Headworks Reservoir Complex Direct Potable Reuse Pilot	$500,000	Los Angeles Department of Water and Power	Ongoing
Ocean Desalination			
OceanWell: A Climate-Resilient, Eco-Friendly, Submerged Reverse Osmosis System	$500,000	Las Virgenes Municipal Water District	Ongoing
Stormwater			
Lake Henshaw Oxygenation Pilot Study	$500,000	San Diego County Water Authority	Ongoing
Data-Driven Resource Optimization and Planning System	$54,900	Foothill Municipal Water District	Ongoing

Metropolitan also supports local supply development as a regional facilitator for seawater desalination and related resource issues. This includes assisting member agencies with technical issues, supporting member agency projects during permit hearings, coordinating responses to proposed regulations, and collaborating with the member agencies to address development challenges. Metropolitan helped launch and participates in CalDesal, a consortium of water utilities and private stakeholders promoting desalination as an element of California's future supply portfolio.

Local Supply Exchange Framework

In August 2025, Metropolitan's Board approved a new framework that allows local water agencies to sell and purchase locally produced supplies among one another. The Local Supply Exchange Framework is an innovative approach that allows Metropolitan to facilitate exchanges of local supplies between its member agencies, providing potential new water sources and an opportunity for agencies to financially benefit from investments in local supplies made throughout the region. Under the Local Supply Exchange Framework, one agency (seller) will produce and consume the local water supply, and in exchange, Metropolitan will deliver an equivalent amount of its water to another agency (buyer). Metropolitan will facilitate the exchanges using its water and infrastructure while protecting system operations and water reliability, and ensuring exchanged water is accounted for appropriately during shortages. The price of the water will be coordinated through an agreement between the seller and the buyer. Metropolitan will coordinate the delivery, accounting, and billing of the exchanged water.

Achievements to Date

Metropolitan has continued to develop and refine its programs to encourage the involvement of its member agencies in water recycling, groundwater recovery, and desalination. Developing and managing these programs requires considerable coordination and refinement. Changing conditions over the last five years have reduced the costs of these options and allow Metropolitan to rely on these sources for future water supply.

Table 3-13 provides a summary of the status of local agency seawater desalination projects that are under development within Metropolitan's service area. While local agencies are considering several proposals, only the Doheny Ocean Desalination Project is under development, with the potential to produce up to 5.6 TAF per year.

Metropolitan is committed to providing financial assistance to the development of water recycling projects throughout its service area. Since 1982, Metropolitan has executed LRP contracts for 90 recycled water projects, 83 of which produced about 40 TAF in FY 2024-25. Local projects not receiving funding from Metropolitan provide an additional 417 TAF of recycled water to the region.

Since 1991, Metropolitan has executed GRP and LRP contracts for 28 recovered groundwater projects which produced about 53 TAF in FY 2024-25. In addition to the projects under Metropolitan's programs, about 74 TAF of degraded groundwater is recovered by agencies in Metropolitan's service area without Metropolitan's financial assistance.

Table 3-14 provides a summary of recycled water use and groundwater recovery in FY 2024-25. As of the fiscal year ending 2025, Metropolitan has invested $549 million in recycling programs and $213 million for groundwater recovery. Table 3-15 provides a summary of the groundwater and recycled water production and incentive payments under Metropolitan's programs to date.

Table 3-13
Seawater Desalination Projects under Development within Metropolitan's Service Area

Project	Member Agency Service Area	Planned Capacity AF per Year	Status as of May 2025
Doheny Ocean Desalination Project	South Coast Water District / Municipal Water District of Orange County	5,600	Planning and Design
Total: Potential Projects		**5,600**	

Note: Does not include potential seawater desalination projects in Mexico which could supply Metropolitan's service area through direct deliveries or through exchanges.

Table 3-14
Fiscal Year 2024-25 Water Production from Recycling and Groundwater Recovery
(acre-feet)

Type of Project	With Metropolitan Funding	Without Metropolitan Funding	Total
Recycled Water	39,800	417,000*	456,900
Groundwater Recovery	52,900	73,500	126,400
Total	**92,700**	**490,600**	**583,300**

*Including the Santa Ana River base flow for the Orange County Basin.

Table 3-15
Local Resources Program

	Recovered Groundwater	Recycled Water	Total
Projects			
Contracted (#)	28	90	118
In Operation (#)	28	83	111
Ultimate Yield (AF)	123,000	369,000	492,000
Deliveries (AF)			
FY 2024-25	52,900	39,800	92,700
Since Inception	1,320,400	3,247,200	4,567,600
Payments ($ millions)			
FY 2024-25	$7.94	$4.88	$12.82
Since Inception	$212.81	549.09	$761.90

3.6 Surface Storage and Groundwater Management Programs: Within the Region

Since the 1950s, local water management in Metropolitan's service area has included the surface water storage and conjunctive use of groundwater. Conjunctive use of water refers to the use and storage of imported surface water supplies in groundwater basins and reservoirs during periods of abundance. This stored water is available for use during periods of low surface water supplies as a way of augmenting seasonal and multi-year shortages.

Background

Metropolitan established general long-term storage guidelines in its Water Surplus and Drought Management (WSDM) Plan. The WSDM Plan provides for flexibility during dry years, allowing Metropolitan to use storage for managing water quality, hydrology, SWP, and Colorado River issues. The approach used in Metropolitan's resource planning assumes that dry-year surface storage can be used as needed and as available within the WSDM planning framework. In addition to surface reservoirs in the region, storage capacity in the region's groundwater basins allows for conjunctive use programs. In 2000, the Association of Ground Water Agencies published Groundwater and Surface Water in Southern California: A Guide to Conjunctive Use that estimated the potential for dry-year or long-term conjunctive use in Metropolitan's service area at approximately 4.0 MAF. In 2007, Metropolitan published the Groundwater Assessment Study that estimated 3.2 MAF of space in groundwater basins available for storage within Metropolitan's service area. In 2025, the space in groundwater basins is estimated to be 5.0 MAF, a decline of 1.8 MAF of water since 2007. This storage equates to groundwater basins being about 38 percent full. Today, about 20 percent of the groundwater basins in the service area are below their established operating range. Metropolitan's 1996 IRP calls for the development of conjunctive use programs with member agencies and groundwater basin managers to store surplus imported supplies in wet years to provide dry-year supplies.

To prepare for supply disruptions, Metropolitan and its member agencies have adopted goals for water storage within the region. Metropolitan has identified in-region storage that should be set aside for use in emergencies, such as a disruption to imported supplies due to a major seismic event at the San Andreas Fault.

Implementation Approach

Surface Storage

Since the beginning of Metropolitan's planning process, two significant changes have occurred to regional surface storage: (1) the construction of DVL, and (2) Metropolitan securing 218,940 AF in Castaic Lake and Lake Perris.

Diamond Valley Lake

Construction of Southern California's newest and largest reservoir nearly doubled the area's surface water storage capacity. Transport of imported water to the lake began in November 1999, and the lake reached capacity in early 2003. DVL holds up to 810 TAF, some of which is for dry-year or seasonal storage, and the remainder for emergency storage. Since 2007, when quagga mussels were identified in Lake Mead, only SWP supplies flow into DVL.

SWP Terminal Reservoirs

Under the 1994 Monterey Agreement and Amendment, Metropolitan is permitted to withdraw up to 218,940 AF in the reservoirs at the southern terminals of the California Aqueduct in addition to the annual SWP allocation. Access to this storage capacity in Castaic Lake (153,940 AF) and Lake Perris (65,000 AF) allows operational flexibility. Any amount of water withdrawn in a year must be replaced with supplies available to Metropolitan within five years.

Groundwater Storage

Many local groundwater storage programs have been implemented over the years to maximize the use of local water supplies. These programs have included the diversion of water flows into percolation ponds for recharging groundwater basins and the recovery of degraded groundwater.

- For many years, flood control agencies within Metropolitan's service area have captured and spread stormwater for groundwater replenishment. Local runoff and reclaimed water have been conserved via spreading grounds, injection wells, reservoirs, and unlined river channels. In addition, flood control agencies have operated seawater barrier projects in Los Angeles and Orange Counties to prevent seawater intrusion into the coastal groundwater basins.
- Water quality issues have raised serious concerns about the ability to sustain average annual production levels in some groundwater basins. For example, recognized threats to groundwater basins posed by emerging contaminants such as per- and polyfluoroalkyl substances (PFAS) have affected groundwater production in many areas. Groundwater levels have been augmented by groundwater recovery projects discussed in Section 3.5.

Conjunctive use of the aquifers offers an important source of dry-year supplies. Unused storage in Southern California groundwater basins can be used to optimize imported water supplies, and the development of groundwater storage projects allows effective management and regulation of the region’s major imported supplies from the Colorado River and SWP. Over the years, Metropolitan has implemented conjunctive use through various programs. Typically, this storage takes place in one of two ways:

- Direct deliveries to storage – Metropolitan delivers recharge water directly to water storage facilities, including spreading sites and injection wells.
- In-lieu deliveries to storage – Metropolitan delivers water directly to a member agency’s distribution system for use by the member agency rather than, or in lieu of, pumping the groundwater it otherwise would have taken out of storage. The deferred local production results in water being left in local storage (surface or groundwater) for future use.

Metropolitan has developed several local programs to work with its member agencies to increase stored water in groundwater basins through conjunctive use. Conjunctive use agreements provide for storage of imported water that can be called for use by Metropolitan during dry, drought, or emergency conditions. During a dry period, Metropolitan has the option to call water stored in the groundwater basins pursuant to its contractual conjunctive

use agreements. At the time of the call, the member agency pays Metropolitan the prevailing rate for that water. Since inception, Metropolitan has drawn on dry-year supply from nine contractual conjunctive use storage programs, three of which are still active, to address shortages from the SWP and the Colorado River.

Metropolitan has also made use of the basins to manage its water supply resources through programs such as its cyclic agreements. Cyclic programs allow Metropolitan to deliver water into the groundwater basin or surface water reservoir before the agency has a demand for water. Advanced deliveries allow Metropolitan to manage high-supply availability when its own storage capacity is limited. The member agency purchases the delivered water based on a long-term schedule agreed by the parties. Although cyclic programs do not hold stored water for Metropolitan, they provide water resource management flexibility, especially when storage capacity is restricted.

Achievements to Date

In 2000, Metropolitan entered an agreement with DWR to administer $45 million of Proposition 13 state bond funds for Metropolitan's Southern California Water Supply Reliability Projects Program. Metropolitan paired the $45 million of state funds with $35 million of Metropolitan capital funds to develop nine groundwater storage programs in partnership with member and retail agencies and groundwater basin managers. These nine contractual storage programs had an initial 25-year term and provide for storage of up to 212 TAF and a dry-year yield of up to 70 TAF. In 2025, six programs were terminated, including Compton, Foothill Area, Live Oak, Long Beach Phase 1 and Phase 2, and Orange County programs. Today, the groundwater storage programs have a total storage of 115 TAF and a dry-year yield of up to 38 TAF. These programs are summarized in Table 3-16. Since inception, the conjunctive use program has been exercised to store water in groundwater basins during wet periods and relied upon to extract that water during dry periods. For example, during the drought period from 2012 to 2016, the conjunctive use program provided 64 TAF of dry-year supply to help Metropolitan meet regional demands. As of June 30, 2025, the conjunctive use storage balance was 77 TAF.

In 2007, Metropolitan prepared the Groundwater Assessment Study Report in collaboration with its member agencies and with groundwater basin managers. The report finds that while there is substantial storage space in service area groundwater basins that could be used for conjunctive use. However, there are significant challenges that must be overcome to implement additional storage programs. Use of additional storage opportunity requires:

- Capture, delivery, and recharge of additional local and imported surface supplies;
- Improved capability to store available surplus surface supplies with adequate conveyance and recharge capacity; and
- Resolution of constraints including: remediation of contamination, institutional and legal issues, funding for significant investment in capital infrastructure, and incongruity between aquifer capability with overlying demand for water supplies.

To follow up on the findings of the Groundwater Assessment Study Report, Metropolitan initiated a series of seven groundwater workshops beginning in July 2008 among Metropolitan, member agencies, groundwater basin managers, and stakeholders to discuss challenges for increasing conjunctive use and to develop recommendations for addressing

the challenges. The workgroup's recommendations were submitted to Metropolitan's Board. The recommendations were as follows:

1. Enhance groundwater replenishment with increased stormwater, recycled water, and imported water recharge.
2. Streamline requirements, remove policy constraints, clarify procedures, increase coordination and sharing of information to accomplish recharge goals.
3. Develop flexible regional policies and programs that can be tailored to meet specific local needs of each groundwater basin.
4. Increase integration of local groundwater and regional water supplies with a proposal for a comprehensive modeling study to initiate review of innovative opportunities.
5. Use appropriate price signals to encourage conjunctive use and investments for storage.
6. Increase coordination among Metropolitan, member agencies, basin managers, groundwater producers, and stakeholders, inclusive of collaboration for legislative, regulatory, and educational efforts in support of specific initiatives and funding needed for sound groundwater management.

Metropolitan staff has provided updates of the Groundwater Assessment Study to the Board in 2011, 2015, and 2018.

Table 3-16
Contractual Conjunctive Groundwater Projects

Project and Project Proponents*	Storage Capacity (TAF)	Dry-Year Yield (TAF/Year)	Storage Account Balance as of 1/1/2025 (TAF)
Los Angeles County			
Upper Claremont Heights Groundwater Storage Program Three Valleys MWD	3.0	1.0	1.2
San Bernardino County			
Chino Basin Conjunctive Use Program IEUA, TVMWD, Chino Basin Watermaster	100.0	33.0	63.8
Riverside County			
Elsinore Groundwater Storage Program Western MWD, Elsinore Valley MWD	12.0	4.0	11.9
Total	**115.0**	**38.0**	**76.9**

* Metropolitan's active Conjunctive Use Programs as of July 1, 2025.

3.7 Water Use Reduction

In November 2009, Governor Arnold Schwarzenegger signed the Water Conservation Act of 2009 (SB X7-7) into law as part of the historic comprehensive water package designed to address the State's growing water challenges. The Act represented the culmination of efforts by water industry leaders (including Metropolitan), the environmental community, and the Legislature to enact legislation that would answer the governor's call for the state to reduce per capita water use 20 percent by the year 2020 (20x2020) as part of a larger effort to ensure reliable water supplies for future generations and restore the Bay-Delta.

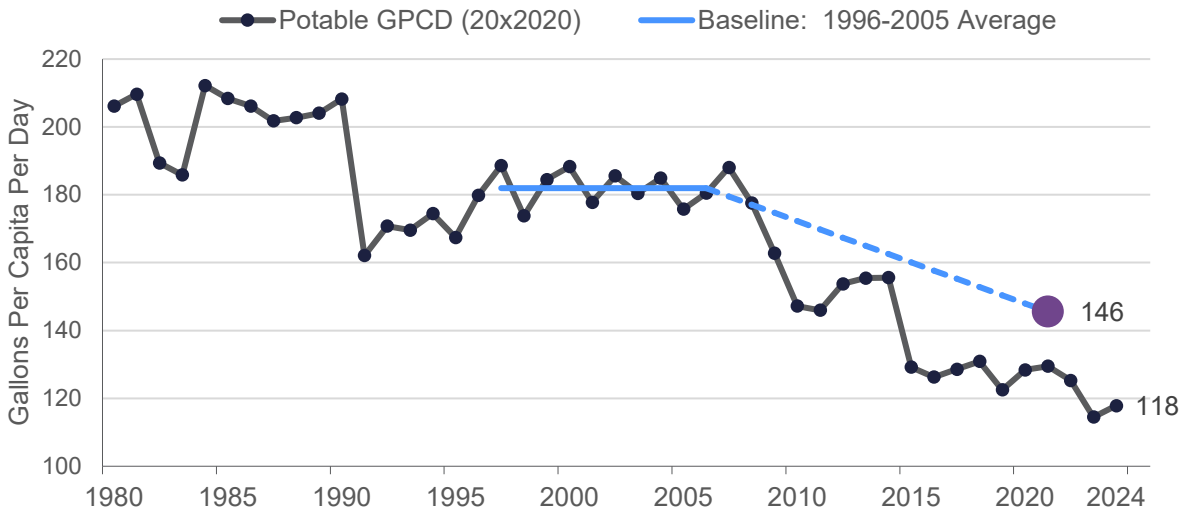
The 20x2020 legislation required urban retail water suppliers to develop urban water use targets to help meet the 20 percent reduction in water use by 2020. The Water Code does not set an end date for reporting on this progress. The legislation provided flexibility in how targets were established and achieved. Per capita reductions can be accomplished through any combination of increased water conservation, improved water use efficiency, and increased use of recycled water to offset potable demand. Potable demand offsets can occur through direct reuse of recycled water, such as for irrigation, or IPR through groundwater replenishment and reservoir water augmentation. Retail water suppliers receive partial credit for past efforts in conservation and recycled water; therefore, not all agencies needed to reduce demand by 20 percent in order to comply with the law.

Achievement as of 2025

As a wholesale water agency, Metropolitan is not required to establish or report an urban water use reduction target. However, Metropolitan's regional conservation programs and local resource programs are designed to assist member agencies and retail water suppliers in the service area to comply with SB X7-7. These programs are described in Sections 3.4 and 3.5. Therefore, Metropolitan monitors the progress of its service area.

Based on an analysis of population, demand, and the methodologies for setting targets described in the legislation, Metropolitan's baseline potable per capita water use is 182 GPCD, and the 2020 reduction target is 146 GPCD. The region met the target ahead of schedule reaching a 129 GPCD, and has sustained GPCD well below the 20x2020 target, reaching as low as 114 GPCD in 2023 and 118 GPCD in 2024. The successful implementation of water use efficiency programs, drought response messaging, and the development of recycled water projects were essential in the region's success in meeting the target.

Figure 3-5
Potable Per Capita Water Use in Metropolitan's Service Area
20% Reduction by 2020



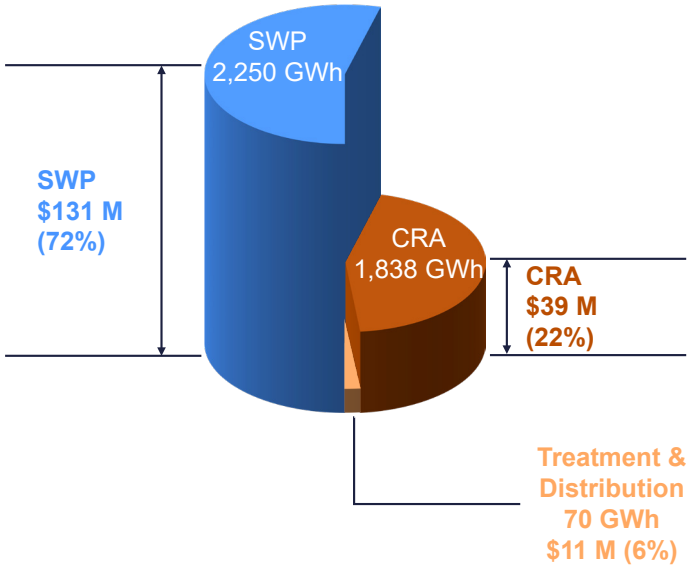
Notes:
1. Calendar year data.
2. Baseline per capita water use based on 1996-2005 average (182 GPCD).
3. Target GPCD for 2020 based on a 20% reduction from baseline (146 GPCD).

3.8 Energy Management Initiative

Metropolitan's mission is to provide its service area with an adequate and reliable supply of high-quality water to meet present and future needs in an environmentally and economically responsible way. The conveyance, treatment, and distribution of water is an energy-intensive and energy-dependent process, and as such, Metropolitan has goals of controlling operational costs and conserving valuable natural resources.

Metropolitan's net energy use and costs are dominated by the pumping (transport) required to import water via the Colorado River Aqueduct (CRA) and State Water Project (SWP) systems as shown in Figure 3-6. Given that Metropolitan does not have direct control over operations of the SWP, its energy strategy focuses exclusively on the energy use and cost for CRA operations (wholesale power) and for Metropolitan's distribution, treatment, and office facilities (retail power), which on average total on the order of $50-60 million per year, but have been trending upwards since 2022 due to retail energy rate increases and wholesale energy market volatility. For example, a nationwide natural gas pricing event that occurred during December 2022-January 2023 increased Metropolitan's CRA energy costs during that period by an estimated $40 million.

Figure 3-6
Metropolitan's Overall Electricity Requirements and Cost*



* Data based on 2013-2022 average.

Over the past several decades, Metropolitan has implemented many energy initiatives in an attempt to reduce energy costs and use, while diversifying its energy portfolio. These have included 130 megawatts (MW) of small hydropower generating facilities, 5.5 MW of solar power generation installations[2], and a 50-year agreement executed in 2017 to receive low-cost carbon-free hydropower from Hoover Dam for CRA operations. Despite these efforts, external factors have resulted in increased energy total costs. Five major drivers influence

[2] This includes 5 MW of solar power capacity located at three of Metropolitan's treatment plants and 0.5 MW located at Diamond Valley Lake.

the future energy market and Metropolitan's corresponding energy sustainability strategy, including:

- *Progression of environmental regulations* – California is leading the nation with energy and environmental policy initiatives that are driving electrical grid changes. In particular, California's shift to renewables and carbon-free energy by 2045 (SB 100) is a primary driver in future energy dynamics and will impact both the cost and volatility of energy markets.
- *Energy market pricing uncertainty* – Approximately 50 to 60 percent of Metropolitan's pumping power comes from low-cost federal hydropower, while the rest must be purchased from the wholesale energy market. Adoption of recent policies and state goals to cut greenhouse gas (GHG) emissions and increase renewable energy are fundamentally changing the wholesale electric grid and its operation. With so much solar power on the system, prices no longer peak in the middle of the day when demand is highest. Instead, they rise in the evening when solar generation drops. This shift creates what is known as the "duck curve." As the sun sets, the grid must quickly ramp up fossil-fuel generation to meet demand. This results in the "belly" of the duck at midday and the steep "arch" ramp in the evening. These swings in wholesale energy prices directly affect Metropolitan's hourly energy costs and operations. During a typical spring day, for example, high solar generation and relatively light loads in the California ISO energy market can drive average energy prices very low or even negative.
- *Grid reliability* – California has historically depended on fossil-fired generation to provide for the bulk of its energy needs, as well as peaking capacity and operating reserves to balance the system and compensate for system contingencies. The state's environmental policies to reduce fossil generation emissions and cooling water impacts have and will continue to result in the retirement of fossil generation throughout the state and the region. The transition to renewable, non-emitting generation creates challenges for grid operators without the traditional sources of on-demand, fast-ramping capacity.
- *Climate change and natural disasters* – Natural disasters and a changing climate pose substantial risks to the availability and price of energy for Metropolitan. While the timing and extent of these events are unpredictable, their effects can be anticipated and estimated. The long-term decline of water levels at Lake Mead is also impacting the availability of Hoover hydroelectric generation, which directly impacts Metropolitan as the largest offtaker of Hoover energy. The main challenge for Metropolitan and its energy providers will be to develop and nimbly execute energy management initiatives that preserve a high degree of long-term flexibility and stable costs.
- *Technological advances and incentives* – New technological advancements and improved practices in the renewable energy and energy storage sectors provide viable options for Metropolitan's long-term energy management goals. For example, energy storage systems are able to capture the energy generated by renewables and store it until the energy is needed. Energy storage can address the power intermittency challenges from renewables and effectively increase utility resiliency

and reliability. Several incentive and credit programs are also available, such as the California Public Utilities Commission's Self-Generation Incentive Program (SGIP), to further improve the economic feasibility of battery energy storage projects.

The evolution in California's energy mix and resulting uncertainty in the reliability and cost of energy supplies affect the affordability and reliability of Metropolitan's water supply operations. Metropolitan's review of its energy strategies, practices and projects is an important step to help position itself as a leader in energy sustainability.

In 2020, Metropolitan developed a new Energy Sustainability Plan (ESP) and an updated implementation roadmap to formulate actions and strategies that best position Metropolitan to adapt to future wholesale and retail energy market changes for its CRA operations and conveyance and distribution system. The ESP's purpose is to foster informed energy management decisions through a framework of sustainable actions focused on energy cost containment, reliability, affordability, conservation, and adaptation—now and into the future. This plan will be updated with target completion in 2028.

The ESP incorporates an adaptive energy management strategy and project implementation roadmap resulting in projects and initiatives that:

- Contain costs and reduce Metropolitan's exposure to energy price volatility
- Increase operational reliability and flexibility
- Move Metropolitan towards energy independence and sustainability
- Support Metropolitan's Climate Action Plan (CAP) effort to meet proposed GHG emissions reduction targets

Metropolitan's adaptive energy management strategy addresses issues surrounding energy management and cost mitigation. The energy strategy roadmap addresses near- to long-term energy issues and achieves Metropolitan's overarching goals by including projects that address both retail and wholesale energy markets, and energy management best practices. The recommended actions are impacted by numerous factors, considered as indicators in this plan, that will signal the acceleration or change of course for certain actions. The magnitude, nature, and timing of these signals will result in different responses and actions for Metropolitan in the long term and will be continuously monitored over time.

Metropolitan is completing Battery Energy Storage System (BESS) projects at the Weymouth, Jensen, and Skinner plants, utilizing state incentive payments, expected online in 2026. The battery storage facilities will be configured as microgrids to optimize on-site solar generation and increase energy resilience.

Selected near-term actions (1-3 years) identified are:

- Implement reconfiguration of the Yorba Linda Power Plant feed to serve the Diemer Water Treatment Plant retail load behind the Southern California Edison meter.
- Evaluate implementation of islanded operations using battery storage for possible future microgrid operations.
- Monitor wholesale energy market developments for major changes to CRA energy costs and evaluate appropriate options, such as generation or energy storage.

- Assess pump modifications at Intake and Gene pumping plants to implement targeted application of variable-speed pump drives.
- Continue to monitor third-party developer projects for opportunities in retail and large-scale wholesale renewable energy and energy storage opportunities.

Selected mid-term actions (4-7 years) include:

- Assess the performance of implemented Battery Energy Storage System projects and later implement the previously deferred project options based on the first phase performance results.
- Implement renewable energy and/or energy storage projects with third-party developers, if determined feasible.
- Continue evaluating low/no carbon power for CRA pumping operations to hedge against rising carbon prices.
- Reevaluate small hydropower opportunities within the distribution system if project economics become favorable, including operation of the Wadsworth hydroelectric generation at Diamond Valley Lake as pumped storage.

Metropolitan engages in several energy best practices to reduce Metropolitan's overall energy consumption. These practices focus on energy auditing, monitoring and benchmarking, cost optimization of process and pumping operations, energy efficient design and rehabilitation measures, and providing staff training and communication strategies for energy management. Energy efficiency opportunities that reduce energy usage are evaluated on a continuous basis for short- and long-term benefits to help reduce energy-related costs and GHG emissions.

Long-term planning over the next ten years will adapt relevant actions and strategies to current conditions. The key goal for Metropolitan's long-term energy management plan is to continuously update the ESP, monitor implemented projects and initiatives, reassess the main market drivers to better understand potential project and energy management opportunities, and adjust the ESP and roadmap accordingly.

The framework is intended to be flexible by accommodating future projects, preferences, and localized needs, and to be adaptable as Metropolitan's goals and technology evolve. The roadmap provides a plan for implementation of the recommended energy projects and initiatives, while accounting for changes in the future. Signals assigned to each action will be monitored over time by Metropolitan staff to indicate when these actions and their economic and operational benefits can serve Metropolitan's needs.

Climate Action Plan

In 2016, California signed into law the country's most stringent GHG reduction target of 40 percent below 1990 levels by the year 2030, as well as a long-term goal of 80 percent below 1990 levels by 2050. In 2017, then-Governor Brown signed EO B-55-18, which set an even more progressive long-term goal of carbon neutrality by 2045. While the state has not imposed specific GHG reduction requirements for public water agencies, its 2017 Climate Change Scoping Plan suggests that water agencies should move towards low-carbon or net-zero carbon water management systems.

To help California achieve this ambitious goal, Metropolitan's first-ever Climate Action Plan (CAP) was adopted by the Metropolitan Board in 2022. The CAP serves as a road map for reducing GHG emissions across Metropolitan's operations and future construction projects. The CAP meets the goals of the state by identifying and implementing a number of actions that will reduce Metropolitan's future GHG emissions. In addition, serves as a vehicle to streamline project evaluation of GHG impacts under the California Environmental Quality Act (CEQA Guidelines § 15183.5(b) Plans for Reduction of Greenhouse Gas Emissions). The CAP includes the following elements:

- A complete inventory of GHG emissions, both existing and projected
- A GHG reduction target aligned with state goals
- A strategy to reduce emissions to meet the GHG reduction target
- A plan to monitor and verify results
- Annual Progress Reports
- A five-year update in 2027

Emissions Inventory

Using standard accounting protocols from The Climate Registry (TCR) and the International Council for Local Environmental Initiatives (ICLEI), Metropolitan completed an emissions inventory of three source categories or scopes related to the operational control the organization has over the emission source.

- Scope 1 emissions consist of direct GHG emissions associated with fuel use, such as emissions from gasoline and diesel consumption by Metropolitan's vehicle fleet, propane and natural gas use at its facilities, and unintended fugitive emissions.[3]
- Scope 2 emissions consist of indirect GHG emissions associated with the purchase and consumption of electricity used primarily for the transmission, treatment, and distribution of water. Scope 2 also includes electricity transmission and distribution losses.
- Scope 3 emissions consist of other indirect GHG emissions not captured in Scope 1 or 2, such as those associated with employee commutes, waste generation, water consumption occurring at Metropolitan facilities, and emissions associated with construction projects.

Emissions Forecast

In order to estimate the level of GHG emissions reductions necessary for Metropolitan to achieve its selected GHG reduction target and be consistent with the requirements for a qualified GHG emissions reduction plan, an emissions forecast was prepared based on Metropolitan projected energy demand and energy sources, the anticipated impact of future

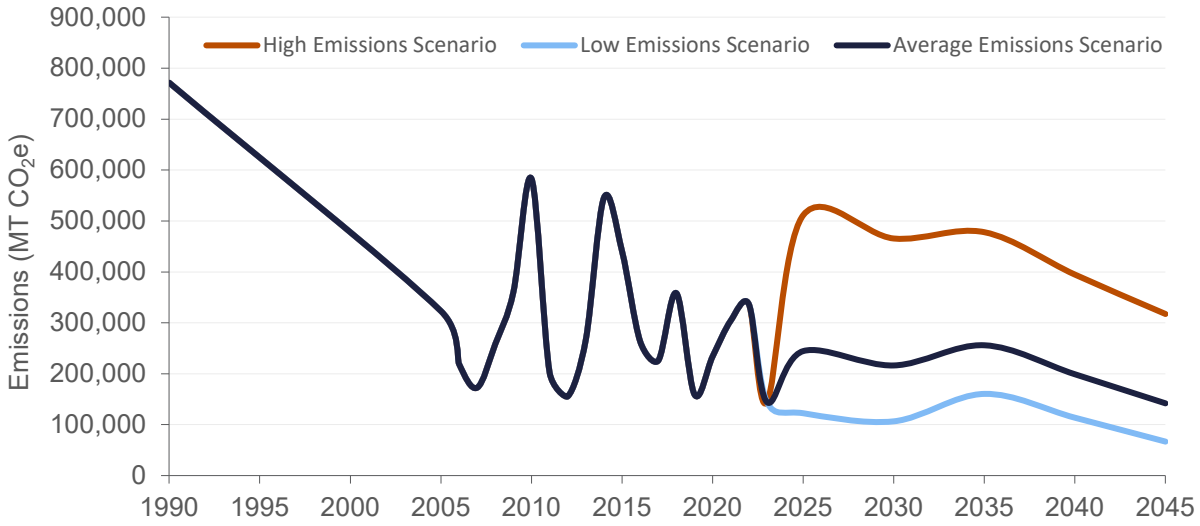
[3] Fugitive emissions are emissions of gases or vapors from industrial equipment due to leaks or other unintended releases.

Metropolitan projects, the anticipated impact of existing energy efficiency and GHG reduction programs, and regional population growth assumptions.

As noted above, Metropolitan does not have direct control over operations of the SWP. Thus, Metropolitan's strategy focuses exclusively on reducing the GHG emissions associated with operation of the CRA, and operation and maintenance of Metropolitan's distribution, treatment, and office facilities. Water deliveries from the CRA require substantial electricity usage, as the water must be pumped up a total lift of 1,614 feet from the Colorado River before flowing by gravity into Metropolitan's distribution system.

CRA water deliveries vary significantly year-to-year based on water needs, rainfall, and availability of water from the SWP. To account for this variability in electricity use and related GHG emissions, three forecast scenarios were modeled to estimate the range of GHG emissions that will need to be reduced to reach Metropolitan's adopted GHG reduction target. A high emissions scenario represents a worst-case scenario with extended drought and maximum pumping capacity from the CRA, an average emissions scenario is modelled by averaging pumping data from 2008 through 2017, and a low emissions scenario represents Metropolitan's lowest single year CRA pumping from 2008 through 2017 and high deliveries from the SWP. The results of the potential range of emissions that will need to be offset in future years is shown in Figure 3-7. Baseline emissions for 1990 were estimated using the best available data. It is important to note that in all projections, GHG emissions taper off as a result of new California regulations that require all retail energy sold in California to be from 100 percent carbon-free energy by 2045.

Figure 3-7
GHG Emissions Forecast and Potential Range



GHG Reduction Target

Metropolitan is committed to achieving the state's GHG reduction goals. Therefore, Metropolitan has set its GHG reduction target to be consistent with the state target of

40 percent below 1990 levels by 2030. In addition, Metropolitan is committing to achieving net carbon neutrality by 2045. Metropolitan is well-situated to meet this goal.

Strategy to Meet GHG Reduction Goals

In conjunction with Metropolitan's Energy Management Initiative described above, a number of projects have been identified that will not only ensure Metropolitan's energy reliability, but also further Metropolitan's efforts to reach carbon neutrality by 2045, including developing solar and battery storage facilities, negotiating wholesale carbon-free energy contracts, improving pump efficiency, purchasing zero emission fleet vehicles, and implementing waste recycling programs/processes. Metropolitan may also leverage extensive land holdings to implement potential carbon sequestration programs that could generate carbon credits. Additional actions will depend on many variables that are not yet quantified, such as the rate of energy storage deployed by the State of California and its utilities, the cost of renewable energy, and the costs associated with infrastructure. Not only do many of these projects ensure energy reliability and reduce GHG emissions, but they may also provide a substantial net cost savings to Metropolitan through reduced energy costs and reduced costs to offset GHG emissions.

Monitoring and Reporting

Ensuring that Metropolitan is meeting its GHG reduction target is a cornerstone of an adopted GHG reduction plan. As such, Metropolitan tracks its GHG emissions annually and will update the CAP every five years to revise and refine the plan to capture any new measures and ensure Metropolitan is meeting its goals. Metropolitan currently reports verified GHG emissions to TCR's open and transparent GHG Registry. Appendix 9 of this plan contains additional information on Metropolitan's GHG emissions and overall energy intensity.

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Water Quality 4

Metropolitan's planning efforts recognize the importance of the quality of its water supplies. Metropolitan employs a multi-barrier approach to safeguard the public's drinking water. The first step in the multi-barrier approach is protecting the quality of the source water and developing water management programs that maintain and enhance water quality. Contaminants that cannot be sufficiently prevented or controlled through protection of source waters must be handled through water treatment protocols or blending. These practices can increase costs and/or reduce operating flexibility. The third step in the multi-barrier approach to ensuring water quality and protecting public health is implementing measures to prevent water quality deterioration in the distribution system after water leaves the treatment plants. Metropolitan ensures distribution system integrity through a regular program of maintenance and inspection and uses chloramines to maintain a stable disinfectant residual in delivered water. The final step is routine testing of treated water to monitor the effectiveness of treatment and distribution processes. This section discusses source water quality and issues of concern affecting water management strategies and water supply reliability.

Background

Metropolitan's planning efforts for groundwater storage, recycled water, and other water management strategies require meeting specific water quality targets for imported water. Metropolitan has two major sources of water: the Colorado River and the State Water Project (SWP). Groundwater inflows are also received into the SWP through groundwater banking programs in the Central Valley. Each source has specific water quality issues, which are summarized in this section. For example, the water industry has had to respond to unregulated emerging contaminants, such as nitrosamines, or other constituents of emerging concern (CECs). To date, Metropolitan has not identified any water quality risks that cannot be mitigated. However, based on current knowledge, a water quality issue that could potentially affect water management strategies and supply reliability in the future might be increases in the salinity of water resources.

During drought conditions, decreased flows have altered Delta flow patterns and, while the effects of droughts have not been fully studied, there have been some observable changes in water quality such as increased salinity due to increased seawater intrusion. In general, SWP salinity is significantly lower than Colorado River water salinity, and Metropolitan relies on blending imported water sources to mitigate for the higher salinity Colorado River water. During the most recent drought from 2020 to 2022, Metropolitan experienced SWP Table A allocations of 20 percent, 5 percent, and 5 percent over the three-year period—the lowest three-year sequence of allocations in the history of the SWP. The limited SWP supplies available during the drought resulted in reduced SWP blending as Metropolitan increased deliveries of its Colorado River water from 2020 through 2022. Treatment plant

influent salinity levels increased overall during the past drought from the higher utilization of Colorado River supplies. Metropolitan anticipates no significant reductions in water supply availability from imported sources due to water quality concerns, such as salinity, over the next five years.

Colorado River

High salinity levels remain a significant issue associated with Colorado River supplies. In addition, Metropolitan has been engaged in efforts to protect its Colorado River supplies from threats of uranium, perchlorate, and chromium-6, which are discussed later in this section. Metropolitan has also been active in efforts to protect these supplies from potential increases in nutrient loading due to agriculture and urbanization, as well as tracking the occurrence of CECs. Metropolitan fully expects its source water protection efforts to be successful, and the only foreseeable water quality constraint to the use of Colorado River water will be the need to blend it with SWP supplies to meet Metropolitan's Board-adopted salinity standards.

State Water Project

The key water quality issues for the SWP are disinfection byproduct precursors, in particular, total organic carbon, bromide, and low alkalinity. Metropolitan is working to protect the water quality of this source, but it has needed to upgrade its water treatment plants to deal adequately with disinfection byproducts. Disinfection byproducts result from total organic carbon and bromide in the source water reacting with disinfectants at the water treatment plants, and they may place some near-term restrictions on Metropolitan's ability to use SWP water. Low alkalinity water requires a higher percentage of total organic carbon removal in order to reduce disinfection byproduct formation. Metropolitan is overcoming these treatment restrictions through the use of ozone disinfection, which has been implemented at all five of Metropolitan's treatment plants, and by blending SWP water with higher alkalinity Colorado River water. Arsenic is also of concern in some groundwater storage programs. Groundwater inflows into the California Aqueduct are managed to comply with regulations and protect downstream water quality while meeting supply targets. Additionally, nutrient levels are significantly higher in the SWP than within the Colorado River, leading to the potential for algal-related concerns that can affect water management strategies. Metropolitan is engaged in efforts to protect the quality of SWP water from potential increases in nutrient loading from wastewater treatment plants.

Local Agency Supplies and Groundwater Storage

Drinking water standards for contaminants, such as arsenic, chromium-6, 1,2,3-trichloropropane, and other emerging constituents, such as per- and polyfluoroalkyl substances (PFAS), may add costs to the use of groundwater storage and may affect the availability of local agency groundwater sources. Although these contaminants are not expected to significantly impact the availability of Metropolitan supplies, they may affect the availability of local agency supplies. This could affect demands on Metropolitan supplies if local agencies abandon impacted supplies in lieu of treatment options or use Metropolitan water to blend with their sources. Metropolitan coordinates with its member agencies through the annual local supply survey to understand the short and long-term impacts of water quality issues to local production.

In summary, the major regional water quality concerns include the following:

- Salinity
- Perchlorate
- Total organic carbon and bromide (disinfection byproduct precursors)
- Nutrients (as they relate to algal productivity and invasive species including golden mussels)
- Arsenic
- Uranium
- Chromium-6
- 1,2,3-trichlorpropane
- Constituents of emerging concern (e.g., NDMA, microplastics, and PFAS)

Metropolitan has taken several actions and adopted programs to address these contaminants and to ensure a safe and reliable water supply. These actions, organized by contaminant, are discussed below, along with other water quality programs that Metropolitan has been engaged in to protect its water supplies.

Issues of Potential Concern

Salinity

The State Water Resources Control Board's (SWRCB) Division of Drinking Water (DDW) established a secondary drinking water standard for salinity, commonly expressed as total dissolved solids (TDS), with a recommended maximum contaminant level (MCL) of 500 milligrams per liter (mg/L) and upper limit MCL of 1,000 mg/L. Imported water from the Colorado River has high salinity levels, so it must be blended with lower-salinity water from the SWP to meet salinity management goals. Higher salinity levels in Colorado River water would increase the proportion of SWP supplies required to meet Metropolitan's Board-adopted imported water salinity objectives. High levels of salinity can impact various water uses such as limiting groundwater and recycled water uses, reducing the lifespan of household appliances, and reducing crop yields. These salinity impacts affect various sectors including residential, agricultural, commercial, industrial, utility, groundwater, and recycled water. Metropolitan adopted an imported water salinity goal because higher salinity could increase costs and reduce operational flexibility. For example:

1. If diminished water quality causes a need for membrane treatment to remove TDS, the process typically results in losses of up to 15 percent of the water processed. These losses would result in both an increased requirement for additional water supplies and environmental constraints related to brine disposal. In addition, the process is costly. However, only a portion of the imported water would need to be processed, so the possible loss in supplies is small.
2. High TDS in water supplies leads to high TDS in wastewater, which lowers the usefulness and increases the cost of recycled water.

3. Water quality degradation of imported water supply could limit the use of local groundwater basins for storage because of standards controlling the quality of water recharged to the basins.

In addition to the link between water supply and water quality, Metropolitan has identified economic benefits from reducing TDS concentrations of water supplies. Estimates show that a reduction in salinity concentrations of 100 mg/L in both the Colorado River and SWP supplies will yield economic benefits of $95 million per year (1999 dollars) within Metropolitan's service area.[1] This economic benefit provides an additional incentive to reduce salinity concentrations within the region's water supplies.

Salinity Management Policy

Considering all of these factors, Metropolitan's Board approved a Salinity Management Policy on April 13, 1999. The policy set a goal of achieving salinity concentrations in delivered water of less than 500 mg/L TDS when practical, understanding that hydrologic conditions will make this infeasible at times. It also identified the need for both local and imported water sources to be managed comprehensively to maintain the ability to use recycled water and groundwater. To achieve these targets, lower TDS SWP water supplies are blended with Colorado River supplies. Due to drought conditions and other factors, the target goal was exceeded during the periods 2008-2011, 2013-2017, in 2019, 2020-2023, and most recently from 2024 to 2025. Metropolitan has alerted its local agencies that high salinity levels are inevitable under these drought conditions despite its best efforts. Metropolitan has also urged its member agencies to structure the operation of their local projects and groundwater supplies so they are prepared to mitigate the effect of higher salinity levels in imported waters.

The adoption of the Salinity Management Policy resulted from the completion of a Salinity Management Study in 1999. Metropolitan worked collaboratively with multiple stakeholders to complete the salinity study which assessed regional salinity problems and developed management strategies. In 2020, the U.S. Bureau of Reclamation (USBR) completed a study updating the economic impact functions of the salinity model. Since then, the model has been used to generate revised estimates for the Lower Colorado River Basin and to update the estimates for Metropolitan's service area. Current estimates of economic damages in the Lower Colorado River Basin attributable to salinity stand at $348 million per year. The impacts estimated by the model are based on the change in economic costs from a 500 mg/L baseline condition and the projected elevated salinity concentrations from the Colorado River Simulation System (CRSS) long-term planning model, which incorporates current and future salinity control projects mainly in the Upper Colorado River Basin.

Within Metropolitan's service area, local water sources account for approximately half of the salt loading, and imported water accounts for the remainder. All of these sources must be managed appropriately to sustain water quality and supply reliability goals. The following sections discuss the salinity issues relevant to each of Metropolitan's major supply sources and other resources.

[1] The Metropolitan Water District of Southern California and U.S. Bureau of Reclamation, Salinity Management Study: Final Report (June 1999)

Colorado River

Colorado River water has the highest level of salinity of all of Metropolitan's sources of supply, averaging around 620 mg/L since 1976 to 2024. Concern over salinity levels in the Colorado River has existed for many years.

To deal with the concern, the International Boundary and Water Commission approved Minute No. 242, Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River, in 1973, and the President approved the Colorado River Basin Salinity Control Act in 1974. High TDS in the Colorado River as it entered Mexico, and the concerns of the seven basin states regarding the quality of Colorado River water in the United States, drove these initial actions. To foster interstate cooperation on this issue, the seven basin states formed the Colorado River Basin Salinity Control Forum (Forum).

The salts in the Colorado River system are indigenous and pervasive, mostly resulting from saline sediments in the Basin that were deposited in prehistoric marine environments. They are easily eroded, dissolved, and transported into the river system. The Colorado River Basin Salinity Control Program is designed to prevent a portion of this abundant salt supply from moving into the river system. The program targets the interception and control of non-point sources, such as surface runoff, as well as wastewater and saline hot springs. Examples of salinity control measures include improved irrigation practices, rangeland management, and the operation of a deep well brine injection project.

The Forum proposed, the states adopted, and the USEPA approved water quality standards in 1975, including numeric criteria and a plan for controlling salinity increases. The standards require that the plan ensure that the flow-weighted average annual salinity remains at or below the 1972 levels, while the Basin states continue to develop their 1922 Colorado River Compact-apportioned water supply. The Forum selected three points on the main stream of the lower Colorado River to measure the river's salinity. These points and numeric criteria are: (1) below Hoover Dam, 723 mg/L; (2) below Parker Dam, 747 mg/L; and (3) at Imperial Dam, 879 mg/L.

Per the Forum, concentrations of salts in the Colorado River cause approximately $348 million in quantified damages (2023 dollars) in the lower Basin each year, with projections that damages would rise to more than $447 million by 2040 if the program were not to continue to be aggressively implemented.[2] The salinity control program has proven to be very successful and cost-effective. Salinity control projects remove over a million tons of salts from the Colorado River water annually, resulting in reduced salinity concentrations of over 100 mg/L as a long-term average.

During the high-water flows of 1983-1986, salinity levels in the Colorado River dropped to a historic low of 525 mg/L. However, during the 1987-1992 drought, higher salinity levels of 600 to 650 mg/L returned. TDS in Lake Havasu was measured at 683 mg/L in December 2023, but TDS concentrations have since fallen, with December 2024's result being measured at 619 mg/L. Salinity is projected to continue increasing as water development occurs throughout the Colorado River basin, particularly as the Upper Colorado River Basin States continue to develop their apportioned water-reducing dilution in the Colorado River. Also, under drought conditions, Lake Powell has received higher salinity water, and as the

[2] Colorado River Basin Salinity Control Program–Briefing Document (January 2024)

system normalizes, salinity is expected to increase in the lower Colorado River as water from Lake Powell is released downstream.

State Water Project

Water supplies from the SWP have significantly lower TDS concentrations than the Colorado River, averaging approximately 250 mg/L in water supplied through the East Branch and 310 mg/L on the West Branch from 1976 to 2024, with short-term variability as a result of hydrologic conditions.[3] Because of this lower salinity, Metropolitan blends SWP water with high salinity Colorado River water to reduce the salinity concentrations of delivered water. However, both the supply and the TDS concentrations of SWP water can vary significantly in response to hydrologic conditions in the Sacramento-San Joaquin watersheds.

As indicated above, the TDS concentrations of SWP water can vary widely over short periods of time. These variations reflect seasonal and tidal flow patterns, and they pose an additional problem for use of blending as a management tool to lower the higher TDS from the Colorado River supply. For example, during the 1977 drought, the salinity of SWP water reaching Metropolitan increased to 430 mg/L, and supplies became limited. During this same event, salinity at the SWP's Banks pumping plant exceeded 700 mg/L. Under similar circumstances in the future, Metropolitan's 500 mg/L TDS objective could only be achieved by reducing imported water from the Colorado River. Thus, it may be infeasible to maintain both the salinity objective and water supply reliability unless salinity concentrations of source supplies can be reduced.

A federal court ruling on a biological opinion issued in consultation with the U.S. Fish and Wildlife Service addressing the effects of the water supply pumping operations on sensitive fish species in the Delta has limited SWP exports at specified times of the year since December 2007. These restrictions have increased reliance on higher salinity Colorado River water, impacting the ability, at times, to meet Metropolitan's goal of 500 mg/L TDS at its blending plants. Drought conditions leading to reduced SWP water supply allocations in recent years have also impacted Metropolitan's ability to meet its salinity goal. The target goal was exceeded between 2008 and 2011, when water supply allocations were reduced to 35-50 percent, briefly reaching a historic low of zero percent in 2014. Although the SWP allocation increased significantly to 60 percent in 2016 following several drought years, salinity levels did not immediately drop and only gradually approached target levels in 2017. In 2019, a reduction in SWP allocation to 35 percent once again led to salinity levels exceeding 500 mg/L. A similar pattern occurred between 2020 and 2023, when allocations ranged from 0 to 35 percent, and salinity levels remained above the target. Most recently, since August 2024, the salinity levels have been above 500 mg/L due to SWP allocations ranging from 10 to 50 percent.

The SWP Water Service Contract Article 19 TDS objectives specify a ten-year average of 220 mg/L and a maximum monthly average of 440 mg/L. A review of water quality data at Metropolitan's main SWP delivery structures for the 10-year period 2015 to 2024 showed that the 10-year average objective of 220 mg/L was not met with actual 10-year average TDS values ranging from 250 to 310 mg/L during this period. However, the monthly

[3] The higher salinity in the West Branch deliveries is due to salt loadings from local streams, operational conditions, and evaporation at Pyramid and Castaic Lakes.

average was always met during this period, with the actual monthly average usually far below the 440 mg/L objective. Metropolitan is working with DWR and other agencies on programs aimed at reducing salinity in Delta supplies. These programs aim to reduce salinity on the San Joaquin River through modifying agricultural drainage and developing comprehensive basin plans. In addition, operable gates and channel barriers have been placed in strategic locations in the Delta to impede transport of seawater-derived salt. For the first time since 1977, in response to California's drought emergency, DWR installed a temporary rock barrier across False River in May 2015 to help limit salt intrusion from the San Francisco Bay into the central Delta. DWR is also leading the development of the Delta Conveyance Project, which involves water delivery upgrades that could reduce SWP salinity levels by diverting a greater percentage of lower salinity Sacramento River flows to the South Delta export pumps.

Recycled Water

Wastewater flows always experience significantly higher salinity concentrations than the potable water supply. Typically, each cycle of urban water use adds 250 to 400 mg/L of TDS to the wastewater. Salinity increases tend to be higher where specific commercial or industrial processes add brines to the discharge stream or where brackish groundwater infiltrates into the sewer system.

Where wastewater flows have high salinity concentrations, the use of recycled water may be limited or require more expensive treatment (e.g., reverse osmosis). Landscape irrigation and industrial reuse become problematic at TDS concentrations over 1,000 mg/L. Some crops such as strawberries and avocados are particularly sensitive to high TDS concentrations, and the use of high-salinity recycled water may reduce crop yields. In addition, water quality objectives in basin plans may lead to restrictions on the use of recycled water on lands overlying those groundwater basins.

These issues are exacerbated during times of drought, when the salinity of imported water supplies may increase salinity in wastewater flows and recycled water. Basin management plans and recycled water customers may restrict the use of recycled water at a time when its use would be most valuable. Therefore, to maintain the cost-effectiveness of recycled water, the salinity level of the region's potable water sources and wastewater flows must be controlled.

In May 2009, the SWRCB adopted a Recycled Water Policy to help streamline the permitting process and to help establish uniform statewide criteria for recycled water projects. The policy was amended in January 2013 and again in December 2018 to include baseline monitoring requirements for CECs. The amended policy includes updated annual volumetric reporting requirements for influent, effluent, and recycled water uses. This policy promotes the development of watershed- or basin-wide salt management plans (to be adopted by the respective Regional Boards) to meet water quality objectives and protect beneficial uses, rather than imposing project-by-project restrictions. The Recycled Water Policy identifies several criteria to guide recycled water irrigation or groundwater recharge project proponents in developing a Salt and Nutrient Management Plan (SNMP). In December 2023, the SWRCB adopted regulations for direct potable reuse, allowing treated wastewater to be introduced directly into drinking water systems without the need for

environmental buffers like reservoirs or aquifers. Regulations and policies for recycled water are discussed further in Chapter 3.5.

Groundwater Basins

Increased TDS in groundwater basins occurs either when basins near the ocean are overdrafted, leading to seawater intrusion, or when agricultural and urban return flows add salts to the basins. Much of the water used for agricultural or urban irrigation infiltrates into the aquifer, so when irrigation water is high in TDS or when the water transports salts from overlying soil, the infiltrating water will increase the salinity of the aquifer. In addition, wastewater discharges in inland regions may lead to salt buildup from fertilizer and dairy waste. In the 1950s and 1960s, high-TDS Colorado River water was used to recharge severely overdrafted aquifers and prevent saltwater intrusion, resulting in significant salt loadings to the region's groundwater basins.

In the past, these high salt concentrations have caused some basins within Metropolitan's service area to be unsuitable for municipal uses if left untreated. The Arlington Basin in Riverside and the Mission Basin in San Diego required demineralization before they could be returned to municipal service. The capacity of the larger groundwater basins makes them better able to dilute the impact of increasing salinity. While most groundwater basins within the region still produce water of acceptable quality, this resource must be managed carefully to minimize further degradation. A 1999 study conducted by USBR and Metropolitan found that approximately 600,000 tons of salts per year accumulate within the region, leading to ever-increasing salinity concentrations in many groundwater basins.[4] Drought conditions have further impacted salinity levels in recycled water, reflective of increased salinity levels in source water. Increased recycled water salinity levels make it difficult for dischargers to comply with water quality objectives for groundwater basins.

To protect the quality of groundwater basins, Regional Boards often place restrictions on the salinity concentrations of water used for basin recharge or for irrigation of lands overlying the aquifers. Those situations may restrict water reuse and aquifer recharge, or they may require expensive mitigation measures. SNMPs offer an opportunity for stakeholders to work with Regional Boards to address salt and nutrient issues regionally. The SNMP development process is locally driven and focuses on addressing all sources of salts and nutrients, instead of only regulating individual recycled water projects which may not address all sources impacting groundwater. The SNMP objectives include: optimizing recycled water use, protecting groundwater supply and beneficial uses, protecting agricultural beneficial uses, and protecting human health.

Since SNMP inclusion in the Recycled Water Policy, the Regional Boards have accepted several SNMPs within the Metropolitan Service Area. The Los Angeles Regional Water Board has accepted SNMPs from the Main San Gabriel Groundwater Basin, Raymond Groundwater Basin, Malibu Valley Groundwater Basin, and the Central & West Coast Groundwater Basin stakeholders. The Santa Ana Regional Water Board has accepted SNMP amendments to the Santa Ana Region Basin Plan, including stakeholders overlying the Orange County, Chino Basin, Elsinore, Temescal, and San Jacinto Groundwater Basin. Additionally, the San Diego Regional Water Board has received multiple completed SNMPs

[4] Metropolitan Water District of Southern California and U.S. Bureau of Reclamation, Salinity Management Study: Final Report (June 1999)

for the San Diego Region, and basin plan amendments are being considered for acceptance.

Perchlorate

Perchlorate is an anion that occurs naturally and is also manufactured and used as a main component in solid rocket propellants and found in some types of munitions and fireworks. Perchlorate compounds quickly dissolve and become highly mobile in groundwater. Unlike many other groundwater contaminants, perchlorate neither readily interacts with the soil matrix nor degrades in the environment. Conventional drinking water treatment (as utilized at Metropolitan's water treatment plants) is not effective for perchlorate removal.

The primary human health concern related to perchlorate is its effect on the thyroid. Perchlorate can interfere with the thyroid's ability to produce hormones required for normal growth and development. Pregnant women who are iodine deficient and their fetuses, infants, and small children with low dietary iodide intake, and individuals with hypothyroidism may be more sensitive to the effects of perchlorate.

DDW established a primary drinking water standard for perchlorate in 2007 with an MCL of 6 micrograms per liter (µg/L), and a detection limit for purposes of reporting (DLR) of 4 µg/L. In February 2015, the California Office of Environmental Health Hazard Assessment (OEHHA) lowered the public health goal (PHG)[5] for perchlorate from 6 µg/L to 1 µg/L. In response to the new PHG, DDW reviewed the perchlorate MCL, but there was a lack of occurrence data below the DLR of 4 µg/L. In July 2020, due to improved analytical methods, and in order to evaluate occurrence data to support a revised MCL, DDW proposed lowering the DLR for perchlorate initially to 2 µg/L, and subsequently to 1 µg/L (at the PHG) in a second phase effective January 1, 2024. On October 6, 2020, the SWRCB approved the proposal, and data above the current DLR of 1 µg/L are currently being reported. Subsequently, more public water systems may report detections of perchlorate over 1 µg/L but will remain in compliance with the MCL if annual average levels remain below 6 µg/L.

There is currently no federal drinking water standard for perchlorate. In 2011, USEPA issued an initial determination to regulate perchlorate under the Safe Drinking Water Act and began efforts to complete a peer-reviewed scientific analysis. USEPA missed the statutory deadlines for proposing the perchlorate regulations and was sued by the Natural Resources Defense Council (NRDC) in 2016, citing USEPA's failure to regulate perchlorate by the deadline. The USEPA and NRDC entered a consent decree requiring USEPA to propose and promulgate the final regulations by 2020. In June 2019, USEPA proposed setting the perchlorate maximum contaminant level goal (MCLG)[6] and MCL at 56 µg/L and requested comments on an alternative MCL of either 18 µg/L or 90 µg/L and on withdrawing the regulatory determination. On July 21, 2020, based on best available science and proactive steps water systems had taken to reduce perchlorate levels, the USEPA withdrew the 2011 determination to regulate perchlorate under the Safe Drinking

[5] A PHG is the level of a chemical contaminant in drinking water that does not pose a significant risk to health. PHGs are not regulatory standards. However, state law requires SWRCB to set drinking water standards known as maximum contaminant levels (MCLs) for chemical contaminants as close to the corresponding PHG as is economically and technologically feasible, placing primary emphasis on the protection of public health.

[6] A maximum contaminant level goal (MCLG) is the level of a contaminant in drinking water below which there is no known or expected risk to health.

Water Act and did not promulgate a federal MCL for perchlorate. In March 2022, the USEPA completed a review of the 2020 perchlorate determination. However, in May 2023, as part of ongoing litigation by the NRDC seeking to compel the USEPA to regulate perchlorate, the D.C. Circuit vacated and remanded USEPA's July 2020 withdrawal. With this new ruling, the USEPA was required to propose an MCLG and a national primary drinking water regulation for perchlorate by November 21, 2025. In addition, the USEPA must finalize an MCLG and national primary drinking water regulation for perchlorate by May 21, 2027. Given the federal government shutdown, NRDC agreed to extend USEPA's deadline to propose a new MCL and MCLG for perchlorate to January 2, 2026. On January 5, 2026, USEPA proposed an MCLG of 20 µg/L and an MCL of 20 µg/L, 40 µg/L, or 80 µg/L. The 60-day public comment period ended on March 9, 2026.

Perchlorate was first detected in Colorado River water in June 1997 and was traced back to the Las Vegas Wash. The source of contamination was found to be emanating from two chemical manufacturing facilities in Henderson, Nevada: (1) the former Tronox, Inc. site, and (2) a facility owned by American Pacific Corporation (AMPAC).

Following the detection of perchlorate in the Colorado River, Metropolitan, along with USEPA and agencies in Nevada including the Nevada Division of Environmental Protection (NDEP), organized the forces necessary to successfully treat and decrease the sources of perchlorate loading. Under NDEP oversight, remediation efforts at the former Tronox site began in 1998, and treatment operations became fully operational in 2004. In 2006, AMPAC began operation of a bioremediation system designed to treat the perchlorate-impacted groundwater at the northern end of the discovered perchlorate plume and prevent perchlorate migration into the Las Vegas Wash. These efforts have reduced perchlorate loading into Las Vegas Wash from over 1,000 lbs/day (prior to treatment) to -50-90 lbs/day since early 2007. This has resulted in an over 90 percent reduction of the perchlorate loading entering the Colorado River system. In 2012, AMPAC[7] began operating a new and larger treatment system located closer to the former PEPCON plant which sped up the remediation process. Since 2011, remediation activities at the former Tronox site have resulted in the removal of more than 5.5 million pounds of perchlorate from the environment. In January 2009, Tronox filed for Chapter 11 bankruptcy protection citing significant environmental liabilities taken from the previous site owner. A settlement was reached in February 2011, which resulted in the formation of the Nevada Environmental Response Trust (NERT). NERT initially received $81 million for clean-up efforts while pursuing additional funding sources.

In April 2014, Tronox reached a $5.15 billion settlement with its predecessors which awarded approximately $1.1 billion, directed to NERT, to clean up perchlorate and certain other contaminants at the former Tronox site in Henderson. The settlement, which represents one of the largest environmental recoveries in history, went into effect in January 2015 and helps to ensure adequate funds are available for site clean-up and protection of the downstream Colorado River. In January 2026, NERT's assets totaled approximately $1.69 billion. NERT is currently evaluating remedial options for long-term soil and groundwater clean-up, as well as completing its investigation of onsite and downgradient perchlorate-contaminated areas. Metropolitan staff continue to review and

[7] In 2015, Endeavour, LLC was formed to take over from AMPAC and continue operation of the treatment system and the ongoing perchlorate remediation effort.

comment on NERT's investigation reports and treatment options to try to ensure that perchlorate from the NERT site will be cleaned up so that perchlorate loading to the Las Vegas Wash is reduced, and imported Colorado River water will comply with a potential reduction of California's perchlorate MCL of 6 µg/L, in light of the PHG and new DLR of 1 µg/L.

As a result of the aggressive clean-up efforts, perchlorate levels in Colorado River water at Lake Havasu have decreased significantly in recent years from a peak of 9 µg/L in May 1998. Levels have remained less than 6 µg/L since October 2002 and have been typically less than 2 µg/L since June 2006. Metropolitan routinely monitors perchlorate at over 30 locations within its system, and levels currently remain below 2 µg/L. Metropolitan has not detected perchlorate in the SWP since monitoring began in 1997.

Perchlorate has also been found in groundwater basins within Metropolitan's service area, largely from local sources. The vast majority of locations where perchlorate has been detected in the groundwater are associated with the manufacturing or testing of solid rocket fuels for the Department of Defense and the National Aeronautics and Space Administration (NASA), or with the manufacture, storage, handling, or disposal of perchlorate (such as Aerojet in Azusa in the Main San Gabriel Basin and the Jet Propulsion Laboratory/NASA in the Raymond Basin). Past agricultural practices using fertilizers laden with naturally occurring perchlorate have also been implicated in some areas. As of February 2026, per SWRCB's water quality database, reported monitoring results from the last 10 years indicate that 808 wells in the counties of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura have detected perchlorate in their service areas at levels greater than the current DLR of 1 µg/L, while 198 wells have detected levels greater than 6 µg/L.[8] Water systems may have installed treatment or removed wells from service due to perchlorate concentrations.

Metropolitan has investigated technologies to mitigate perchlorate contamination. Perchlorate cannot be removed using conventional water treatment. Nanofiltration and reverse osmosis do work effectively, but at a very high cost. Endeavour, LLC and NERT utilize a biological fluidized bed reactor process train for the clean-up of their Henderson sites. A number of sites in Southern California have successfully installed ion exchange systems to treat perchlorate-impacted groundwater. In November 2009, a study of biological treatment for perchlorate removal in the City of Pasadena's groundwater was completed with funding provided through a Congressional mandate from USEPA to Metropolitan. The City of Pasadena decided to continue using ion exchange treatment for perchlorate removal and expanded treatment to two well sites.

Treatment options are available to recover groundwater supplies contaminated with perchlorate. However, it is very difficult to predict whether treatment will be pursued to recover all lost production because local agencies will make decisions based largely on cost considerations, ability to identify potentially responsible parties for clean-up, and the availability of alternative supplies.

[8] DDW data reported from the SWRCB Groundwater Ambient Monitoring Assessment Program's web site: https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/. Numbers reported may change as the website is frequently updated. Also, the website includes additional source data reported by other entities.

Total Organic Carbon and Bromide

Disinfection byproducts (DBPs) form when source water containing high levels of total organic carbon (TOC) and bromide is treated with disinfectants such as chlorine or ozone. Studies have shown a link between certain cancers and DBP exposure. In addition, some studies have shown an association between reproductive and developmental effects and chlorinated water. While many DBPs have been identified and some are regulated under the Safe Drinking Water Act, there are others that are not yet known. Even for those that are known, the potential adverse health effects may not be fully characterized.

Water agencies began complying with new regulations to protect against the risk of DBP exposure in January 2002. This rule, known as the Stage 1 Disinfectants and Disinfection Byproducts (D/DBP) Rule, required water systems to comply with new MCLs and a treatment technique to improve control of DBPs. USEPA then promulgated the Stage 2 D/DBP Rule in January 2006, requiring systems to comply at terminus locations in the distribution system to be more representative of maximum residence time and to protect the public. Metropolitan has been in compliance with the Stage 2 D/DBP Rule since it became effective.

Existing levels of TOC and bromide in Delta water supplies present challenges for water utilities to maintain safe drinking water supplies and comply with regulations. Levels of these constituents in SWP water increase several-fold due to agricultural drainage and seawater intrusion as water moves through the Delta.

SWP water has also experienced lower alkalinity concentrations during years with increased snowmelt, particularly in 2017, 2019, and 2023. Low alkalinity requires higher TOC removal by treatment plants and potentially contributes to increased water corrosivity. As a corrosion control strategy, Metropolitan may blend low alkalinity SWP water with Colorado River Water, adjust effluent pH, and increase plant effluent alkalinity.

Source water quality improvements must be combined with cost-effective water treatment technologies to ensure safe drinking water at a reasonable cost. Metropolitan has five treatment plants: two that receive SWP water exclusively, and three that receive a blend of SWP and Colorado River water. In 2003 and 2005, Metropolitan completed upgrades to its SWP-exclusive water treatment plants, Mills and Jensen, respectively, to utilize ozone as its primary disinfectant. This ozonation process minimizes the production of certain regulated disinfection byproducts that would otherwise form in the chlorine treatment of SWP water. The non-ozone plants utilizing blended water met federal guidelines for these byproducts through managing the blend of SWP and Colorado River water. To maintain the byproducts at a level consistent with federal law, Metropolitan limited the percentage of water from the SWP for plants utilizing chlorine as the primary disinfectant. In 2010, 2015, and 2017, Metropolitan completed ozone upgrades at Skinner, Diemer, and Weymouth water treatment plants, respectively. The ozone retrofit cost for all five treatment plants was $1.1 billion.

Nutrients

Elevated levels of nutrients (phosphorus and nitrogen compounds) can stimulate nuisance algal and aquatic weed growth that affects water system operations and consumer acceptability, including the production of noxious taste and odor compounds and algal

toxins. In addition to taste and odor and toxin concerns, increases in algal and aquatic weed biomass can impede flow in conveyances, shorten filter run times, increase solids production at drinking water treatment plants, and add to organic carbon loading. Further, nutrients can provide an increasing food source that may lead to the proliferation of mussels and other invasive biological species. Studies have shown phosphorus to be the limiting nutrient in both SWP and Colorado River supplies. Therefore, any increase in phosphorus loading has the potential to stimulate algal growth, leading to the concerns identified above. Metropolitan has an Invasive Mussel Control Program that is described in Chapter 3.1.

SWP supplies have significantly higher nutrient levels than Colorado River supplies. Wastewater discharges, agricultural drainage, and nutrient-rich soils in the Delta are primary sources of nutrient loading to the SWP. Metropolitan and other drinking water agencies receiving Delta water have been engaged in efforts to minimize the effects of nutrient loading from Delta wastewater plants. The Sacramento Regional County Sanitation District, now consolidated with the Sacramento Area Sewer District and known as SacSewer, is the primary discharger to the Sacramento River. SacSewer completed its EchoWater Project wastewater treatment plant upgrade in 2023 to comply with its 2010 discharge permit requirements for ammonia and nitrate removal. Excessive levels of ammonia are suspected to be altering the Delta's food web which, in turn, has implications for SWP supply reliability. SacSewer stated the treatment plant now removes 99 percent of ammonia and 89 percent of nitrogen from its wastewater. The project will serve multiple benefits including improving water quality in the Sacramento River, protecting the fragile Delta ecosystem, and expanding recycled water use opportunities. The improvements include a biological nutrient removal process for ammonia and nitrate. The project also included tertiary treatment processes for filtration and enhanced disinfection. In 2014, the City of Stockton Wastewater Treatment Plant, a discharger to the San Joaquin River, was issued a draft permit with a more stringent nitrate discharge limit consistent with the final discharge limits issued in SacSewer's permit. Due to the lower limit, the City of Stockton implemented similar plant upgrades as SacSewer to comply with discharge permit requirements.

Cyanobacteria

Metropolitan reservoirs receiving SWP water have experienced several taste and odor episodes in recent years. For example, between 2020 and June 2025, Metropolitan reservoirs experienced 5 taste and odor events requiring treatment. A taste and odor event can cause a reservoir to be bypassed and potentially have a short-term effect on the availability of that supply. Metropolitan has a comprehensive program to monitor and manage cyanobacteria in its source water reservoirs. This program was developed to provide an early warning of cyanobacteria-related problems and taste and odor events to best manage water quality in the system.

The issue of cyanotoxins has become a growing concern as a result of increasing occurrences both nationally and internationally. For example, in August 2014, an algae bloom producing Microcystin in Lake Erie significantly affected the water supply for Toledo, Ohio, prompting the city to issue urgent notices to residents to not drink or boil the drinking water. This event stimulated state and federal legislation to develop health advisories and strategic plans for algal toxins. In June 2015, USEPA issued health advisories for two

cyanobacterial toxins: Microcystins and Cylindrospermopsin. The health advisories serve as recommended precautionary levels and are not enforceable federal water quality standards. Cyanotoxins were included on Contaminant Candidate List (CCL) 4 and CCL5, which identifies contaminants considered for regulation under the Safe Drinking Water Act. USEPA has developed improved analytical methods for cyanotoxins to support nationwide monitoring for Microcystins, Anatoxin-a, and Cylindrospermopsin through the Unregulated Contaminant Monitoring Rule 4 program, which was published in 2016 and required monitoring to be conducted between 2018 and 2020. Metropolitan complied with Unregulated Contaminant Monitoring Rule monitoring and reporting requirements. Although phosphorus levels are much lower in the Colorado River than in the SWP, this nutrient is still of concern. Despite relatively low concentrations (Colorado River has been considered an oligotrophic, or low-productivity, system), any additions of phosphorus to Colorado River water can result in increased algal growth. In addition, low-nutrient Colorado River water is relied upon by Metropolitan to blend down the high-nutrient SWP water in Metropolitan's blend reservoirs. With population growth expected to continue in the Las Vegas area in the future, ensuring high levels of treatment at wastewater treatment plants to maintain existing phosphorus levels will be critical in minimizing the operational, financial, and public health impacts associated with excessive algal growth and protecting downstream drinking water uses. Metropolitan and other affected drinking water agencies collaborate with wastewater dischargers in the Las Vegas area to protect the phosphorus-limited Colorado River. Since 2001, wastewater dischargers have undertaken considerable efforts to improve treated effluent water quality by removing phosphorus on a year-round basis. In 2005, dischargers also began optimizing their treatment processes to remove greater amounts of phosphorus, maintaining levels well below current permit requirements. This has resulted in phosphorus loading into Lake Mead from the Las Vegas area being reduced from up to 1,000 lbs a day in the 1990s to less than 200 lbs a day since 2016.

Although current nutrient loading is of concern for Metropolitan and is anticipated to have cost implications, with its comprehensive monitoring program and response actions to manage algal-related issues, there should be no impact on the availability of water supplies. Metropolitan's source water protection program will continue to focus on preventing future increases in nutrient loading as a result of urban and agricultural sources.

Arsenic

Arsenic is a naturally occurring element found in rocks, soil, water, and air. It is used in wood preservatives, alloying agents, certain agricultural applications, semiconductors, paints, dyes, and soaps. Arsenic can get into water from the natural erosion of rocks, dissolution of ores and minerals, runoff from agricultural fields, and discharges from industrial processes. Long-term exposure to elevated levels of arsenic in drinking water has been linked to certain cancers, skin pigmentation changes, and hyperkeratosis (skin thickening).

In April 2004, OEHHA set a PHG for arsenic of 0.004 µg/L, based on lung and urinary bladder cancer risk. The MCL for arsenic in domestic water supplies was lowered to 10 µg/L, with an effective date of January 2006 in the federal regulations, and an effective date of November 2008 in the California regulations. Monitoring results submitted to DDW since 2010 showed that arsenic is ubiquitous in drinking water sources, reflecting its natural occurrence. They also showed that many sources have arsenic detections above the

10 µg/L MCL. Southern California drinking water sources that contain concentrations of arsenic over 10 µg/L in the last five years, by county. include San Bernardino (52 sources), Los Angeles (59 sources), Riverside (22 sources), San Diego (3 sources), Orange (6 sources), and Ventura (3 sources).[9] On October 3, 2025, OEHHA announced it is updating the PHG for arsenic. OEHHA explained that in the last three years, arsenic has been detected in California drinking water supply wells, with concentrations ranging from 0.1 to 1,560 µg/L. Approximately 11 percent of the wells sampled had concentrations greater than the state MCL of 10 µg/L.

The arsenic drinking water standard impacts both groundwater and surface water supplies. Historically, Metropolitan's water supplies have had low levels of this contaminant and did not require treatment changes or capital investment to comply with the standard. However, some of Metropolitan's water supplies from groundwater storage programs are at levels near the MCL. These groundwater storage projects are called upon to supplement flow only during low SWP allocation years. Under drought conditions, Metropolitan has further relied on groundwater storage programs and continues to participate in the Facilitation Group to ensure that water quality in the SWP is not adversely affected when considering water supply decisions. Metropolitan has had to restrict flow from one program to limit arsenic increases in the SWP. Implementation of an arsenic treatment facility, which is operated by a groundwater banking partner, has increased groundwater supply costs. Moreover, Metropolitan has invested in solids handling facilities at its treatment plants and implemented operational changes to manage arsenic in the treatment process for residual solids.

The DLR for arsenic is 2 µg/L. Between 2010 and June 2025, arsenic levels in Metropolitan's water treatment plant effluents ranged from non-detect (< 2 µg/L) to 4.4 µg/L. For Metropolitan's source waters, levels in Colorado River water have ranged from 1.9 to 3.7 µg/L, while levels in SWP water have ranged from non-detect to 6.8 µg/L. Increasing coagulant doses at water treatment plants can reduce arsenic levels for delivered water.

Some member agencies may face greater problems with arsenic compliance due to naturally occurring arsenic in groundwater. Per the Water Replenishment District's 2023-2024 Regional Groundwater Monitoring Report, arsenic concentrations greater than the 10 µg/L MCL were detected in 20 of 220 Central Basin production wells.[10] Water supplies imported by the Los Angeles Department of Water and Power may also contain arsenic above the MCL. The cost of arsenic removal from these supplies could vary significantly.

Uranium

The U.S. Department of Energy (DOE) has completed a project to remove a 16-million-ton pile of uranium mill tailings near Moab, Utah, which lies approximately 750 feet from the Colorado River. Due to the proximity of the pile to the Colorado River, there was a potential for the tailings to enter the river as a result of a catastrophic flood event or other natural disaster. In addition, contaminated groundwater from the site is slowly seeping into the

[9] DDW data reported from the SWRCB Groundwater Ambient Monitoring Assessment Program's web site: https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/. Numbers reported may change as the website is frequently updated. Also, the website includes additional source data reported by other entities.
[10] *Regional Groundwater Monitoring Report Water Year 2023-2024, Los Angeles County, California*, prepared by Water Replenishment District, March 2025.

river. The DOE is responsible for remediating the site, which includes removal and offsite disposal of the tailings and onsite groundwater remediation.

Previous investigations have shown uranium concentrations contained within the pile at levels significantly above the California MCL of 20 picocuries per liter (pCi/L). Metropolitan has been monitoring for uranium in the CRA and at its treatment plants since 1986. Monitoring at Lake Powell began in 1998. Uranium levels measured at Metropolitan's intake have ranged from 1 to 6 pCi/L, well below the California MCL. Conventional drinking water treatment, as employed at Metropolitan's water treatment plants, can remove low levels of uranium; however, these processes would not be protective if a catastrophic event washed large volumes of tailings into the Colorado River. Public perception of drinking water safety is also of particular concern as to uranium.

Remedial actions at the site since 1999 have focused on removing contaminated water from the uranium mill tailings pile and treating groundwater. To date, over 5,800 pounds of uranium in contaminated groundwater have been removed. In July 2005, DOE issued its Final Environmental Impact Statement with the preferred alternative of permanent offsite disposal by rail to a disposal cell at Crescent Junction, Utah, located approximately 30 miles northwest of the Moab site.

Rail shipment and disposal of the uranium mill tailings pile from the Moab site began in April 2009 using American Recovery and Reinvestment Act 2009 funding, which helped to accelerate initial clean-up efforts. Through September 2025, DOE has shipped 16 million tons of mill tailings to the Crescent Junction disposal cell and completed its goal of removing the pile. Although the tailings are gone, final cleanup work will continue at the site with site closure expected in 2029. Metropolitan will continue to track the progress of site remediation efforts.

Another uranium-related issue began receiving attention in 2008 due to a renewed worldwide interest in nuclear energy and a resulting increase in uranium mining claims filed throughout the western United States. Of particular interest were thousands of mining claims filed near Grand Canyon National Park and the Colorado River. Metropolitan sent letters to the Secretary of the Interior to highlight source water protection and consumer confidence concerns related to uranium exploration and mining activities near the Colorado River, and advocate for close federal oversight over these activities. In 2009, Secretary of the Interior Ken Salazar announced a two-year hold on new mining claims on 1 million acres adjacent to the Grand Canyon to allow necessary scientific studies and environmental analyses to be conducted. In January 2012, Secretary Salazar formally signed a 20-year moratorium on new uranium and other hard-rock mining claims. The moratorium has been challenged by a number of industry groups and was upheld by a U.S. District Court in September 2014. Meanwhile, local conservation groups continue to defend the moratorium and are seeking additional protection of lands with mines that have been inactive for long periods of time but may resume operations. Although of no direct impact to Metropolitan due to its upstream location and resulting dilution, in August 2015, an accidental release of wastewater from an abandoned mine in southwest Colorado demonstrated the potential threat that mining activities can have on public health and the environment. In 2020, the DOE released a strategy to revive and expand nuclear fuel production which would be of interest to Metropolitan if projects are in proximity to the Colorado River. On January 20, 2025, Executive Order 14156 was issued, declaring a

National Energy Emergency. The order allows for expedited reviews of priority mineral projects with approval times significantly shortened. Section 8(a) of the Executive Order includes uranium in its definition of energy resources to be expedited under the emergency powers.

Chromium-6

Chromium is a naturally occurring element found in rocks, soil, plants, and animals. Chromium-3 is typically the form found in soils and is an essential nutrient that helps the body use sugar, protein, and fat. Chromium-6 is used in electroplating, stainless steel production, leather tanning, textile manufacturing, dyes and pigments, wood preservation, and as an anti-corrosion agent. Chromium occurs naturally in deep aquifers and can also enter drinking water through discharges of dye and paint pigments, wood preservatives, chrome plating liquid wastes, and leaching from hazardous waste sites. In drinking water, chromium-6 is very stable and soluble, whereas chromium-3 is not very soluble. Chromium-6 is the more toxic species and is known to cause lung cancer in humans when inhaled, but the health effects in humans from ingestion are still in question. There is evidence that when chromium-6 enters the stomach, gastric acids may reduce it to chromium-3. However, studies conducted by the National Toxicology Program have shown that chromium-6 can cause cancer in animals when administered orally.

Effective July 1, 2014, California's Office of Administrative Law approved a primary drinking water standard of 10 µg/L for chromium-6. In May 2017, the Superior Court of Sacramento County issued a judgment invalidating California's MCL of 10 µg/L for chromium-6 on the basis that the California Department of Public Health (now DDW) had not properly considered the economic feasibility of complying with the MCL. DDW therefore rescinded the chromium-6 MCL and continued to regulate chromium-6 as part of total chromium. California's MCL for total chromium is 50 µg/L. In February 2020, DDW released a white paper discussion on an updated economic feasibility analysis of chromium-6 treatment for the consideration of a new chromium-6 MCL. In 2023, DDW started the formal rulemaking process for establishing a new MCL, and on October 1, 2024, the new chromium-6 MCL of 10 µg/L became effective. USEPA regulates chromium-6 as part of the total chromium drinking water standard of 100 µg/L and is currently evaluating whether a new federal drinking water standard for chromium-6 is warranted based on new health effects information.

Metropolitan utilizes an analytical method with a minimum reporting level of 0.03 µg/L, which is less than the State DLR of 0.1 µg/L. The following summarizes chromium-6 levels found in Metropolitan's system and source waters:

In the past five years (2020-2024), results of source and treated water monitoring for chromium-6 indicate the following:

- Levels in Colorado River water are mostly not detected (<0.03 µg/L), but when detected, levels range from 0.03 to 0.05 µg/L. SWP levels at Check 41 range from 0.03 to 1.7 µg/L. Treated water levels range from 0.03 to 1.1 µg/L. There is a slight increase in chromium-6 in the treated water from the oxidation (chlorination and ozonation) of natural background chromium (total) to chromium-6.

- Colorado River monitoring results upstream and downstream of the site of a Pacific Gas and Electric (PG&E) gas compressor station located along the Colorado River near Topock, Arizona (discussed below) have historically ranged from not detected (<0.03 µg/L) to 0.06 µg/L.
- Chromium-6 in Metropolitan's groundwater pump-in storage programs in the Central Valley has ranged from not detected (< 1 µg/L) to 10 µg/L.

PG&E used chromium-6 as an anti-corrosion agent in its cooling towers at the Topock site from 1951 to 1985. Wastewater from the cooling towers was discharged from 1951 to 1968 into a dry wash next to the station. Monitoring wells show the plume concentration has peaked as high as 16,000 µg/L in groundwater. From 2004 to 2021, PG&E operated an interim groundwater extraction and treatment system to protect the Colorado River. Now the long-term groundwater remedy system is operating and protecting the Colorado River. Quarterly monitoring of the river has shown levels of chromium-6 less than 1 µg/L, which are considered background levels. The California Department of Toxic Substances Control (DTSC) and the U.S. Department of the Interior are the lead state and federal agencies overseeing the clean-up efforts. Metropolitan participates through various stakeholder workgroups and partnerships that include state and federal regulators, Indian tribes, and other stakeholders (e.g., Colorado River Board) involved in the corrective action process. In January 2011, a final treatment remedy was selected, and an Environmental Impact Report was certified. In November 2015, PG&E completed the final remedy design based on the selected remedy which involves the installation of an in-situ bioremediation treatment system. In April 2015, DTSC required the preparation of a Subsequent Environmental Impact Report (EIR) to address new design details. The Subsequent EIR was certified in April 2018. Construction of Phase 1, consisting of an In-situ reduction zone, began in October 2018 and was completed in 2021. Phase 2, consisting of a freshwater injection system, is currently under construction and is expected to be operational and functional in 2029. Operation of the treatment system will run for an estimated 30 years.

The federal- and state-approved technologies for removing total chromium from drinking water include reduction/coagulation/filtration, ion exchange, reverse osmosis, and lime softening.

1,2,3-Trichloropropane (1,2,3-TCP)

1,2,3-TCP is a chlorinated hydrocarbon with high chemical stability. It is a manmade chemical found at industrial or hazardous waste sites. It has been used as a cleaning and degreasing solvent and also is associated with pesticide products.

In July 2017, the SWRCB adopted an MCL of 5 parts per trillion (ppt) for 1,2,3-TCP, and related requirements, including establishing a DLR, identifying the best available technology for treatment, and setting public notification and consumer confidence report language. The regulations also included a method for public water systems to substitute existing water quality data for initial monitoring requirements under certain circumstances. Under the regulation, drinking water agencies are required to perform quarterly monitoring of 1,2,3-TCP. There have been no detections of this chemical in Metropolitan's system. However, 1,2,3-TCP has been detected above the MCL in groundwater wells of three of Metropolitan's groundwater storage program partners through monitoring performed by these agencies. Levels detected in groundwater wells of the Arvin-Edison Water Storage

District are the highest and impact the ability of Metropolitan to put water and take return water under that program. Metropolitan has temporarily suspended normal operations of this program until the water quality concerns can be further evaluated and managed. In the meantime, Metropolitan and Arvin-Edison continue to participate in surface water exchanges as needed. The levels of 1,2,3-TCP detected in Metropolitan's other groundwater storage programs are much lower and impact fewer groundwater wells. Metropolitan is evaluating the effects of 1,2,3-TCP on the return capability of those programs. Southern California counties that have detected concentrations of 1,2,3-TCP in drinking water sources over 5 ppt in the last 5 years include San Bernardino (49 sources), Los Angeles (44 sources), Riverside (18 sources), San Diego (7 sources), and Ventura (2 sources).[11]

Constituents of Emerging Concern

N-Nitrosodimethylamine

N-Nitrosodimethylamine (NDMA) is part of a family of organic chemicals called nitrosamines. NDMA is the most frequently detected nitrosamine in drinking water as an unintended byproduct of the chloramination of drinking water and the chlorination of wastewater. NDMA is also made naturally in humans at low levels and found in some preserved foods, beverages, drugs, and tobacco smoke. Metropolitan utilizes chloramines as a secondary disinfectant at its treatment plants. Wastewater treatment plant discharges can contribute organic matter into source waters, which react with chloramines to form NDMA at drinking water treatment plants. Certain coagulation aid polymers used in water treatment, e.g., polydiallyldimethylammonium chloride (polyDADMAC), can also contribute to NDMA formation. Some NDMA control measures are being used to avoid adverse impacts on Southern California drinking water supplies. Metropolitan has been involved in several projects to understand the effect of different treatment processes on NDMA and its precursors at drinking water treatment plants, drinking water distribution systems, and recycled water. Certain pre-oxidation processes, such as chlorine and ozone, have been shown to destroy NDMA precursors.

USEPA considers NDMA as a probable human carcinogen and included it on the Contaminant Candidate List 4 (CCL4). Although there are currently no federal or state regulations (MCLs) for nitrosamines in drinking water, DDW has set a notification level of 0.01 µg/L each for NDMA and two other nitrosamines [N-Nitrosodiethylamine (NDEA) and N-Nitrosodi-n-propylamine (NDPA)]. Occurrences of NDMA in treated water supplies at concentrations greater than 0.01 µg/L are recommended to be included in a utility's annual Consumer Confidence Report. DDW also established a response level of 0.3 µg/L for NDMA and recommends any sources exceeding the response level be removed from service. In December 2006, OEHHA set a PHG for NDMA of 0.003 µg/L. In December 2024, OEHHA released a draft revision of the NDMA PHG, recommending lowering it to 0.0005 µg/L.

Since 1999, Metropolitan has conducted voluntary monitoring of the five treatment plant effluents and representative distribution system locations annually. NDMA is detected in

[11] DDW data reported from SWRCB Groundwater Ambient Monitoring Assessment Program's web site: https://gamagroundwater.waterboards.ca.gov/gama/gamamap/public/ Numbers reported may change as the website is frequently updated. Also, the website includes additional source data reported by other entities.

Metropolitan's treated water systems in the range of non-detect (<0.002 µg/L) to 0.006 µg/L. No other nitrosamines were detected at any of the monitoring locations, except for *N*-Nitrosodi-n-butylamine (NDBA) at one sampling location and in one single 2024 sampling event (0.003 µg/L). Currently, NDBA does not have a public health goal or notification level. NDMA or a broader class of nitrosamines may likely be the next class of disinfection byproducts to be regulated by USEPA or DDW.

Pharmaceuticals and Personal Care Products

Pharmaceuticals and personal care products (PPCPs) are a growing concern to the water industry. Numerous studies have reported the occurrence of these emerging contaminants in treated wastewater, surface water, and sometimes, in finished drinking water in the United States and around the world. The use of ozone in treatment processes has a beneficial effect on PPCP removal in drinking water. The sources of PPCPs in the aquatic environment include (but may not be limited to) treated wastewater and industrial discharge, agricultural runoff, and leaching of municipal landfills. Currently, there is no evidence of human health risks from long-term exposure to the low concentrations (low ng/L; parts per trillion) of PPCPs found in some drinking water. Furthermore, there are no regulatory requirements for PPCPs in drinking water. USEPA included 14 PPCPs on the CCL3 and ten PPCPs on the CCL4, nine of which are carried over from the CCL3. USEPA's strategy for addressing PPCPs involves strengthening analytical methods, conducting source studies, improving public understanding of PPCPs in water, building partnerships and promoting stewardship opportunities, and taking regulatory action when appropriate.

In 2007, Metropolitan implemented a short-term monitoring program to determine the occurrence of PPCPs and other organic wastewater contaminants in Metropolitan's treatment plant effluents and selected source water locations within the Colorado River and SWP watersheds. Currently, PPCP monitoring is conducted on an annual basis for Metropolitan's source waters and treatment plants. Some PPCPs have been detected at very low ng/L levels, which is consistent with reports from other utilities. Metropolitan has been actively involved in studies related to PPCPs, including analytical methods improvements and characterization of drinking water sources in California.

Microplastics

In 2018, Senate Bill No. 1422 added Section 116376 to the Health and Safety Code, which required the SWRCB to adopt a definition of microplastics in drinking water on or before July 1, 2020. Section 116376 also required the SWRCB on or before July 1, 2021, to: (1) adopt a standard methodology to be used in the testing of drinking water for microplastics; (2) adopt requirements for four years of testing and reporting of microplastics in drinking water, including public disclosure of those results; (3) if appropriate, consider issuing a notification level or other guidance to help consumer interpretations of the results of the testing required; and (4) accredit qualified laboratories in California to analyze microplastics. On June 16, 2020, the SWRCB adopted a definition, acknowledging that it may be revised in the future as new information and understanding emerge. The definition reads: *'Microplastics in Drinking Water' are defined as solid polymeric materials to which chemical additives or other substances may have been added, which are particles which have at least three dimensions that are greater than 1nm and less than 5,000 micrometers*

(µm). Polymers that are derived in nature that have not been chemically modified (other than by hydrolysis) are excluded.

Between 2019 to 2020, Metropolitan, together with 21 laboratories, participated in a methodology study on microplastics sampling, extraction, and analysis, facilitated by the Southern California Coastal Water Research Project (SCCWRP). Standard operating procedures (SOPs) for the extraction and measurement of microplastics with Raman and infrared spectroscopy were made available by SCCWRP and SWRCB on September 28, 2021. On November 10, 2021, SWRCB released a draft *Microplastics in Drinking Water Policy Handbook,* which was formally adopted on August 9, 2022. The policy handbook states that SWRCB will employ a two-phase iterative approach for monitoring microplastics to gather sufficient information to estimate potential health risks from exposure via drinking water. Phase I monitoring focuses on measuring microplastics larger than 20 or 50 µm in source waters, while phase II will involve characterizing microplastics both smaller and larger than 20 µm in treated drinking water. Metropolitan, along with nine of its member agencies and other local water agencies, was selected as one of 29 public water systems for potential monitoring. On April 12, 2023, Metropolitan hosted a microplastics information exchange workshop for its member agencies and other local water agencies listed in the handbook. On August 7, 2023, Metropolitan submitted its proposed sampling locations to SWRCB for the Phase I monitoring plan. The selected locations were those suitable for microplastics sampling and most representative of Metropolitan's two imported water supplies. The proposal was approved by DDW on November 3, 2023. In February 2025, SWRCB held two workshops on the "Sample Collection Method for Microplastics in Drinking Water," which included training and hands-on demonstration of a proposed method for collecting drinking water samples for microplastic analysis. The workshops underscored the rapidly evolving nature of microplastic science and highlighted the uncertainties remaining on microplastics method development, data quality, and potential health effects.

A second piece of legislation, Senate Bill No. 1147 passed in September 2024, requires California's Office of Environmental Health Hazard Assessment (OEHHA) to study the health effects of microplastics in drinking water and bottled water. Under SB 1147, OEHHA is required to evaluate toxicity characteristics and levels of microplastics in water that are not expected to cause or contribute to adverse health effects, or to identify data gaps that would need to be addressed to establish such levels. While SB 1147 does not specify a timeline, it requires OEHHA to provide biennial status updates, which may include the compilation of findings into a report, and to post the final report on its website. Metropolitan is closely monitoring scientific and regulatory developments related to microplastics and is proactively evaluating the performance of various microplastics analytical methods that could be used to monitor its water systems in the future. In addition, Metropolitan collaborates with state lawmakers and regulators as they develop legislation for the monitoring and evaluation of microplastics. Metropolitan advocates for a science-based approach, emphasizing the need for robust scientific evidence before regulatory actions are implemented to ensure the protection of public health and improvement of water quality.

Per- and Polyfluoroalkyl Substances (PFAS)

Per-and polyfluoroalkyl substances (PFAS) are a large class of synthetic chemicals that have been used in industry and consumer products since the 1940s. PFAS are commonly used to make products resistant to water, heat, oil, and stains. Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are the two most common PFAS. Drinking water containing PFOA and PFOS— and the larger family of PFAS—has become an increasing concern due to the persistence of these chemicals in the environment and their tendency to accumulate in groundwater.

In August 2019, the SWRCB's Division of Drinking Water (DDW) lowered the notification levels from 14 parts per trillion (ppt) to 5.1 ppt for PFOA and from 13 ppt to 6.5 ppt for PFOS. These levels were based on updated health recommendations from the Office of Environmental Health Hazard Assessment (OEHHA), which is part of the California Environmental Protection Agency. Notification levels are non-regulatory, precautionary health-based measures for concentrations of chemicals in drinking water that warrant notification and further monitoring and assessment. If a chemical concentration is greater than its notification level in drinking water that is provided to consumers, DDW recommends that the utility inform its customers and consumers about the presence of the chemical and about health concerns associated with exposure to it. The SWRCB also revised response levels (RLs) of 10 parts per trillion (ppt) for PFOA and 40 ppt for PFOS based on a running four-quarter average. Previously, the RL was 70 ppt for the total concentration of the two contaminants combined. A response level is set higher than a notification level and represents a chemical concentration level at which DDW recommends a water system consider taking a water source out of service or providing treatment if that option is available to them. Legislation which took effect on January 1, 2020 (California Assembly Bill 756) requires that water systems that receive a monitoring order from the SWRCB and detect levels of PFAS that exceed their respective RLs must either take the drinking water source out of use or provide specified public notification if they continue to supply water above the RL. In March 2021, DDW set a notification level (NL) of 0.5 parts per billion (ppb) and an RL of 5 ppb for perfluorobutane sulfonic acid (PFBS). The NL for PFBS is 100 times higher than the NLs for PFOA and PFOS. In October 2022, DDW issued an NL of 3 ppt and an RL of 20 ppt for perfluorohexane sulfonic acid (PFHxS). In September 2024, OEHHA recommended an NL for PFHxA of 1,000 ppt. In April 2024, OEHHA adopted public health goals (PHGs) for PFOA and PFOS at 0.007 ppt and 1 ppt, respectively, a further step in establishing their MCLs in drinking water. DDW will use the PHGs to develop drinking water standards for PFOA and PFOS that are as close to the PHGs as possible but still technically and economically achievable for drinking water systems. In May 2025, DDW requested OEHHA to also develop a PHG for PFHxS. On July 3, 2025, DDW proposed lowering the NLs for PFOA and PFOS to 4 ppt, lowering the RL for PFHxS to 10 ppt, and establishing a new NL and RL for PFHxA at 1,000 ppt and 10,000 ppt, respectively. On October 3, 2025, OEHHA announced that it would be developing the PHG for PFHxS and requested data and information that could assist in conducting the risk assessment and in calculating the PHG. The deadline for submitting data and information was November 3, 2025. On October 29, 2025, DDW lowered the NLs for PFOA and PFOS to 4 ppt, lowered the RL for PFHxS to 10 ppt, and established a new NL and RL for PFHxA at 1,000 ppt and 10,000 ppt, respectively.

On March 4, 2024, DDW issued a PFAS General Order (DW-2024-0002-DDW) asking certain public water systems to allow DDW to sample once for PFAS at no charge by August 31, 2026. The purpose of the monitoring is to understand PFAS impacts on drinking water in disadvantaged communities not necessarily near a known industrial source. Metropolitan was one of the public water systems that received the General Order for a groundwater monitoring well at the Jensen water treatment plant and registered for the free sampling. PFOS was detected at a concentration of 4.8 ppt in the groundwater monitoring well in a sample collected on December 2, 2025. The well is one of three wells that were installed in the 1990s to manage nuisance groundwater during construction of a finished water reservoir. The wells are continuously drained to maintain the structural integrity of the reservoir. Well water is pumped to the washwater reclamation plant where it is treated and then directed to the head of the treatment plant for further treatment. This well water accounts for an average contribution of 0.06 percent of total plant flow, which equates to a 1 in 1,660 dilution factor. After the water is treated at the washwater reclamation plant and then blended with other source water at the head of the plant, any PFOS that might remain in the water going into the Jensen treatment plant is well below the Consumer Confidence Report Detection Level of 2 ppt. Thus, there is no PFOS detected in the water leaving the Jensen plant after treatment.

On December 12, 2025, DDW issued a PFAS General Order (DW-2025-0002-DDW) requiring community and nontransient noncommunity water systems to conduct initial PFAS monitoring for four consecutive quarters per source, with all sampling to be completed by March 31, 2027. In response to the monitoring order, Metropolitan began quarterly PFAS monitoring at its source water compliance locations starting February 2026. Metropolitan has been monitoring annually for PFAS and, in general, has periodically detected certain PFAS near the method detection limits. DDW's NLs and RLs should have minimal impact on Metropolitan, although they may impact Metropolitan's member agencies and their retail providers.

On the federal level, on December 27, 2021, the USEPA published the final Fifth Unregulated Contaminant Monitoring Rule (UCMR) for public water systems which includes monitoring for 29 PFAS in drinking water. UCMR 5 required pre-sampling preparations in 2022, and sample collection from 2023 to 2025, with reporting of final results through 2026. On April 10, 2024, the USEPA announced the final national primary drinking water regulation (NPDWR) for six PFAS. The regulations set: (1) an MCL of 4 ppt for PFOA and PFOS; (2) an MCLG of zero for PFOA and PFOS; and (3) an MCL and MCLG of 10 ppt each for perfluorononanoic acid (PFNA), HFPO-DA (also known as GenX Chemicals), and PFHxS. In addition, the USEPA set a novel hazard index MCL and MCLG of 1 (unitless) for any two or more of the following four PFAS as a mixture: PFNA, PFHxS, GenX Chemicals, and PFBS. Public water systems must monitor for these PFAS and have three years to complete initial monitoring by June 2027, followed by ongoing compliance monitoring. Water systems must also provide the public with information on the levels of these PFAS in their drinking water beginning in 2027. All public water systems are required to comply with the PFAS NPDWR by 2029 and notify the public of any violations. In May 2025, the USEPA announced it intends to keep the MCLs of 4 ppt for PFOA and PFOS and to extend for two years until 2031 the deadline for water systems to meet the drinking water standards for PFOA and PFOS. The USEPA also announced that it intends to rescind the regulations and reconsider the regulatory determinations for PFHxS, PFNA, GenX Chemicals, and the

Hazard Index mixture of these three plus PFBS "to ensure that the determinations and any resulting drinking water regulation follow the legal process laid out in the Safe Drinking Water Act." These actions were in response to the American Water Works Association (AWWA), the Association of Metropolitan Water Agencies (AMWA), and several chemical industry associations filing Petitions for Review in 2024 asking a federal appellate court to decide whether the USEPA failed to comply with the Safe Drinking Water Act when setting the MCLs and MCLGs for the six PFAS. The litigation was stayed for several months while new USEPA leadership determined how to proceed. On September 11, 2025, the USEPA filed a motion to vacate its MCLs, MCLGs, and determination to regulate PFNA, PFHxS, and the GenX Chemicals individually and to regulate mixtures of those three PFAS and PFBS through a hazard index (collectively, Hazard Index PFAS). The USEPA admitted that parts of its rulemaking process were unlawful and, therefore, parts of its PFAS regulations are invalid. AWWA, AMWA, and the other plaintiffs consented to the USEPA's motion, but the parties that intervened in the lawsuit (including NRDC) opposed the motion. After the parties had filed responses to the USEPA's motion, on October 3, 2025, the court granted the USEPA's unopposed motion to stay the litigation given the shutdown of the federal government. Two months later, the court lifted the stay, and on January 21, 2026, the court denied USEPA's motion to vacate its MCLs, MCLGs, and determination to regulate the four Hazard Index PFAS. On February 19, 2026, EPA filed a Motion to Sever and put on hold the challenges to the Hazard Index PFAS MCLs and MCLGs because EPA's upcoming rule, which it said it would propose soon, will rescind these limits and may moot the challenges. In the meantime, the parties' final briefs are due by March 6, 2026.

On September 6, 2022, the USEPA issued a proposed rule designating PFOA and PFOS as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). On April 13, 2023, the USEPA requested public input on whether to designate: (i) seven additional PFAS (PFBS, PFHxS, PFNA, GenX, PFBA, PFHxA, and perfluorodecanoic acid (PFDA), (ii) precursors to these seven PFAS and to PFOA and PFOS, and (iii) groups or categories of PFAS, as hazardous substances under CERCLA. Metropolitan provided comments on these proposals and urged the USEPA to further evaluate the potentially significant impacts of the proposed CERCLA designation on water and wastewater utilities. On May 8, 2024, the USEPA published its final rule designating PFOA and PFOS, including their salts and structural isomers, as CERCLA hazardous substances. On June 10, 2024, the Chamber of Commerce of the United States of America, Associated General Contractors of America, Inc., and National Waste & Recycling Association filed a Petition for Review, asking the D.C. Circuit Court to decide whether the USEPA acted appropriately in designating PFOA and PFOS as CERCLA hazardous substances. The American Chemistry Council and others also filed petitions for review. The NRDC and other groups moved to intervene in defense of the USEPA's final rule. The litigation was stayed for several months to give the new Administration time to decide how to proceed. On September 17, 2025, the USEPA announced that it is retaining the CERCLA hazardous substance designation for PFOA and PFOS and intends to develop a CERCLA Section 102(a) Framework Rule to provide a uniform approach to guide future hazardous substance designations. On October 2, 2025, the court set a briefing schedule and ordered that final briefs must be filed by December 5, 2025. The court heard oral arguments on January 21, 2026, but as of February 23, 2026, had not issued a decision.

Metropolitan has voluntarily monitored PFAS in its source and treated water since 2017. Most samples have shown non-detect (ND) for all tested PFAS. Eight PFAS—PFHxA, PFBA, PFPeA, PFOS, PFDA, PFDoA, PFTA, and PFBS—have been detected at trace levels above their method detection limits (MDL, 2 ng/L). The most frequently detected PFAS in Metropolitan's source and treated waters are PFHxA and PFBA, with annual average concentrations ranging from ND to 6.0 ng/L and ND to 3.0 ng/L, respectively, from 2017 to 2025. Six other PFAS (PFPeA, PFOS, PFDA, PFDoA, PFTA, and PFBS) were detected less frequently in source water supplies from 2017 to 2025, with annual average concentrations below 5.0 ng/L.Some member agencies have detected PFAS in their groundwater wells. As DDW moves to establish MCLs for certain PFAS, Metropolitan's member agencies may be confronted with the choice of implementing treatment or inactivating their affected sources to remain in compliance with DDW regulations. This may cause those systems to supplement their water needs with increased purchases of Metropolitan water.

1,4-Dioxane

1,4-dioxane has been used as a stabilizer for solvents, in particular 1,1,1-trichloroethane (TCA), and a solvent in its own right, as well as in a number of industrial and commercial applications. 1,4-dioxane enters wastewater principally from industrial discharges, with low, widespread, and continuous contributions from commercial products that are washed down the drain after use. 1,4-dioxane is persistent in the environment and highly soluble in water, which allows it to leach into and remain in groundwater. The SWRCB set a notification level of 1 µg/L for 1,4-dioxane in drinking water in November 2010, revising an earlier notification level of 3 µg/L set in March 1998 that was based on a risk determination by the USEPA and concurrence from OEHHA. In August 2010, the USEPA revised its 1,4-dioxane risk evaluation, lowering the recommended levels in drinking water by nearly 10-fold to 0.35 µg/L. Following the USPEA's reevaluation of risk, the SWRCB revised the notification level to 1 µg/L and established its response level at 35 µg/L. On January 22, 2019, the SWRCB asked OEHHA to establish a PHG for 1,4-dioxane. OEHHA's PHG will be used by the SWRCB to set an MCL for 1,4-dioxane in drinking water. On September 26, 2025, OEHHA proposed a PHG of 0.04 ppb for 1,4-dioxane.

Advanced oxidation treatment is currently the water industry's preferred treatment technology for 1,4-dioxane. However, DDW has not yet adopted a Best Available Technology for 1,4-dioxane treatment. From 2013 to 2015, the USEPA, under the Unregulated Contaminant Monitoring Rule (UCMR 3), required all large water systems (i.e., water systems serving over 10,000 people) to collect and analyze more than 12,000 drinking water samples for 1,4-dioxane. This occurrence data identified 23 public water sources in California with detections of 1,4-dioxane. There are currently 248 wells in Los Angeles County and Orange County that have detected 1,4-dioxane over the NL (17 percent).[12] In 2025, Metropolitan conducted monthly testing of its source water supplies, including both CRW and SPW, and no 1,4-dioxane was detected at any of the sampling sites (i.e., < 10 ng/L).

[12] DDW data reported from SWRCB Groundwater Ambient Monitoring Assessment Program's web site: https://gamagroundwater.waterboards.ca.gov/. Numbers reported may change as the website is frequently updated. Also, the website includes additional source data reported by other entities.

Other Water Quality Programs

In addition to monitoring for and controlling specific identified chemicals in the water supply, Metropolitan has undertaken several programs to protect the quality of its water supplies. These programs are summarized below.

Source Water Protection

Source water protection is the first step in a multi-barrier approach to provide safe and reliable drinking water. In accordance with California's Surface Water Treatment Rule, Title 22 of the California Code of Regulations, DDW requires large utilities delivering surface water to complete a Watershed Sanitary Survey every five years to identify possible sources of drinking water contamination, evaluate source and treated water quality, and recommend watershed management activities that will protect and improve source water quality. The most recent sanitary surveys for Metropolitan's water sources are the Colorado River Watershed Sanitary Survey—2020 Update and the State Water Project Watershed Sanitary Survey—2021 Update.[13] The next sanitary surveys for the watersheds of the Colorado River and the SWP will report on watershed and water quality issues through 2025.

Metropolitan has an active source water protection program and continues to advocate on numerous issues to protect and enhance SWP and Colorado River water quality. As part of its source water protection program, Metropolitan monitors and forecasts source water quality, including closely monitoring the biology and limnology of lakes and aqueducts. Monitoring is conducted to comply with regulatory requirements, respond to water quality events, assess temporal variability, advise operations, and investigate emerging constituents and invasive species.

Colorado River Water Quality Partnerships

Metropolitan collaborates with external partners to assess and manage watershed threats to Colorado River water quality. Metropolitan is a member of the Clean Colorado River Sustainability Coalition, which was formed in 1997 and focuses on protecting and enhancing the Colorado River through monitoring and analysis of water quality to assure and sustain high-quality water for all users of the Colorado River. In 2011, Metropolitan formed the Lower Colorado River Water Quality Partnership with the Southern Nevada Water Authority and Central Arizona Project to identify and implement collaborative solutions to address water quality issues facing the Colorado River. Metropolitan also participated in the Lake Mead Water Quality Forum, which was formed in 2012, and its Lake Mead Ecosystem Monitoring Workgroup subcommittee. The Lake Mead Water Quality Forum's goals were to support the protection of human health and the environment and to preserve and improve the water quality of the Las Vegas Wash, Las Vegas Bay, and Lake Mead (and as a result, the Colorado River). The forum reformed in 2024 after being dormant for several years and currently offers a venue for Colorado River stakeholders to discuss and share their various types of work and research on Lake Mead and the Colorado River. In addition, as discussed earlier, Metropolitan is a member of the Colorado River Basin Salinity Control Forum which facilitates coordination between Basin states and

[13] The Metropolitan Water District of Southern California, *Colorado River Watershed Sanitary Survey, 2020 Update*. For the State Water Project, the sanitary survey report was prepared on behalf of the State Water Project Contractors Authority, in 2022, and was titled *California State Water Project 2021 Watershed Sanitary Survey Update*.

federal agencies on salinity matters and the implementation of the Colorado River Basin Salinity Control Program.

SWP Water Quality Programs

Metropolitan supports DWR policies and programs aimed at maintaining or improving the quality of SWP water delivered to Metropolitan. In particular, Metropolitan supports the DWR policy that governs the quality of non-project water conveyed by the California Aqueduct. Non-project water is considered to be any inflow to the SWP that is not directly diverted from the Delta. Most non-project water originates as groundwater pumped into the California Aqueduct through turn-in structures in the southern San Joaquin Valley. Non-project water can be admitted to the California Aqueduct for conveyance and redistribution provided it does not result in the degradation of SWP water quality, cause toxicity to fish and wildlife, or adversely affect beneficial users. In addition, Metropolitan supports DWR's Municipal Water Quality Investigations (MWQI) Program in its core mission to protect the effective and efficient use of the SWP as a source of water supply for municipal purposes through monitoring, forecasting, and reporting of Sacramento-San Joaquin Delta and SWP water quality. The MWQI Program also provides early warning of water quality changes that may affect treatment plant operations both in the short-term (hours) and the mid-term (up to three weeks).

Metropolitan has implemented selective withdrawals from storage programs and exchanges to improve water quality. Although these programs were initially designed to provide dry-year supply reliability, they can also be used to store SWP water at periods of better water quality so the stored water may be withdrawn at times of lower water quality, thus diluting SWP water deliveries. Although elevated arsenic levels have been a concern in one groundwater banking program, there are also short-term water quality benefits that can be realized through storage programs, such as groundwater pump-ins into the California Aqueduct with lower TOC levels (as well as lower bromide and TDS, in some programs).

Regulatory and Legislative Actions

Metropolitan conducts technical reviews of regulatory and legislative actions that may have an effect on the quality of Metropolitan's source waters. These may include changes in federal and state water quality standards; California Environmental Quality Act (CEQA) documents for projects or programs within Metropolitan's source watersheds; National Pollutant Discharge Elimination System permits for wastewater discharges into the Delta or Colorado River systems; and regulations or statewide policies and permits affecting source water quality or reservoir management issues. In recent years, emerging challenges such as the detection of PFAS in source waters and the potential spread of invasive golden mussels have further emphasized the need for proactive source water protection and technical engagement in regulatory processes. For more information on golden mussels, please see "Invasive Mussel Control Program" under "Implementation Approach" in Chapter 3.1.

In addition, Metropolitan advocates and provides funding requests for key source water protection priorities, including Colorado River salinity control. In 2020, Metropolitan also co-sponsored SB 996 with the California Municipal Utilities Association to establish a statewide CEC program, which was re-introduced as SB 230 in 2021's legislative session.

SB 230 was signed into law in October 2021 and formally established the CEC program under the SWRCB. The program is now active and focuses on monitoring and assessing emerging contaminants in California's water sources to support public health protection and water quality management.

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Coordination and Public Outreach

5

Collaborative Regional Planning

Southern California meets its water challenges through collaborative long-range planning, bringing local perspectives and data together with expert knowledge of hydrology, climate change, demographics, and economics. Metropolitan's 2025 Urban Water Management Plan (UWMP) was developed in conjunction with Metropolitan's planning processes with the Integrated Water Resources Plan (IRP) and Climate Adaptation Master Plan for Water (CAMP4W) and provides a representation of Metropolitan's planning elements reported under the conditions required by the Act. Together, these plans serve as the reliability road map for the region. The planning process involved extensive coordination with Southern California's wholesale and retail water agencies, as well as municipal service providers and public planning agencies. Outreach efforts sought to engage the general public, businesses, environmental organizations, diverse communities, cities, counties, and other stakeholders with an interest in the future of Southern California's water supplies.

This chapter describes how Metropolitan's process to develop the 2025 UWMP and Water Shortage Contingency Plan (WSCP) complies with the provisions for coordination and public outreach in the Urban Water Management Planning Act included as part of the California Water Code (CWC) §10610, et seq.

Concurrent Planning with the 2020 Integrated Water Resources Plan and Climate Adaptation Master Plan for Water (CAMP4W)

Metropolitan and its member agencies used a scenario planning approach for the 2020 IRP Regional Needs Assessment and CAMP4W. Instead of focusing on a target for future water supply needs, this approach encouraged broader thinking and discussion on possible future conditions for local and imported water supply and retail demand, and the policy implications for Metropolitan. Adaptive management during implementation will allow flexibility in how the region prepares for the supply and demand conditions that are becoming more likely. The planning started with identifying drivers of change for water supply and demand, understanding how they interact, and then assessing the potential scale of impact in the future. Data sources were identified that could be used for quantitative and qualitative analysis. The detailed analyses of future local and imported water supplies, economic growth, demographics and water demands, and changing hydrology were incorporated into the 2025 UWMP and WSCP. Adopted in April 2021, the 2020 IRP Needs Assessment served as a foundation for subsequent work on CAMP4W, the second phase of Metropolitan's long-term resource planning process. As part of the CAMP4W process, Metropolitan established a Joint Task Force comprised of Metropolitan Board directors and general managers from its member agencies. The IRP and CAMP4W

processes are further described under “Integrated Water Resource Planning” in Chapter 2.1.

Board of Directors Oversight

In February 2023, the Board directed staff to integrate water resources, climate considerations, and financial planning into CAMP4W. Metropolitan’s Board of Directors provided oversight throughout the ongoing process for the development of CAMP4W that informed the preparation of the 2025 UWMP. Board meetings are open to the public, and the public is invited to provide comments at each meeting. Board meetings with topics that informed the development of the 2025 UWMP between August 2023 and March 2026 are summarized in Table 5-1.

Table 5-1
Summary of Metropolitan Board of Directors Meetings

Date	Committee	Topic
December 13, 2021	Water Planning and Stewardship Committee	SB 60 Public Hearing - Review of 2020 UWMP and Metropolitan’s Achievements in Conservation, Recycling, and Groundwater Recovery
December 12, 2022	Water Planning and Stewardship Committee	SB 60 Public Hearing - Review of 2020 UWMP and Metropolitan’s Achievements in Conservation, Recycling, and Groundwater Recovery
August 22, 2023	Subcommittee on Long-Term Regional Planning Processes and Business Modeling	Review of planning framework
November 21, 2023	Subcommittee on Long-Term Regional Planning Processes and Business Modeling	Review of planning assumptions to be used for CAMP4W and Business Model development
January 8, 2024	Water Planning and Stewardship Committee	SB 60 Public Hearing - Review of 2020 UWMP and Metropolitan’s Achievements in Conservation, Recycling, and Groundwater Recovery
August 28, 2024	Subcommittee on Long-Term Regional Planning Processes and Business Modeling	Review of service area population data used for reliability planning
January 13, 2025	One Water and Adaptation Committee	SB 60 Public Hearing - Review of 2020 UWMP and Metropolitan’s Achievements in Conservation, Recycling, and Groundwater Recovery

Table 5-1
Summary of Metropolitan Board of Directors Meetings (continued)

Date	Committee	Topic
January 29, 2025	Subcommittee on Long-Term Regional Planning Processes and Business Modeling	CAMP4W Working Memorandum 7: Integrating Climate Change Adaptation into Metropolitan's Planning Processes
February 26, 2025	Subcommittee on Long-Term Regional Planning Processes and Business Modeling	CAMP4W Working Memorandum 7: Integrating Climate Change Adaptation into Metropolitan's Planning Processes
July 7, 2025	One Water and Adaptation Committee	Update on Urban Water Management Plan
September 23, 2025	Joint One Water & Adaptation Committee and Subcommittee on Imported Water	Update on Urban Water Management Plan
September 30, 2025	Subcommittee on CAMP4W	Updated Baseline Planning Scenarios for CAMP4W
December 8, 2025	Joint One Water & Adaptation Committee and Subcommittee on Imported Water	Update on Urban Water Management Plan
January 12, 2026	One Water and Adaptation Committee	SB 60 Public Hearing - Review of UWMP and Metropolitan's Achievements in Conservation, Recycling, and Groundwater Recovery
February 9, 2026	One Water and Adaptation Committee	Update on draft Urban Water Management Plan: member agency comments and public review draft
March 9, 2026	One Water and Adaptation Committee	Update on draft Urban Water Management Plan: public review draft and upcoming public hearing
April 13, 2026	One Water and Adaptation Committee	Public Hearing for the draft 2025 UWMP and 2025 WSCP update
May 12, 2026	Board of Directors Meeting	Adoption of the 2025 UWMP and 2025 WSCP update

Coordination with Member Agencies and Other Organizations

Metropolitan coordinated the preparation of the 2025 UWMP and the WSCP with its 26 member agencies, wastewater management agencies, municipal service providers, groundwater management agencies, cities and counties within which Metropolitan provides water supplies, and regional planning agencies. The extensive regional coordination is consistent with the requirements of CWC Sections 10610.2(a)(4), 10620(d)(3), 10621(b), 10641, and 10642. With the readoption of the WSCP included as part of the 2025 UWMP, the required coordination, notification, hearing, and adoption of the WSCP was accomplished side by side and concurrently with the 2025 UWMP process. Additionally, the WSDM Plan and WSAP, which are planning components included as part of the WSCP, were previously developed through extensive coordination with member agencies and various stakeholders and adopted by Metropolitan's Board in 1999 and 2008, respectively, and subsequent revisions to the WSAP were adopted in 2009, 2010, 2011, and 2014.

Metropolitan collaborated with its member agencies through the Member Agency Managers meetings, as well as the UWMP Coordination Meetings with member agencies and other appropriate agencies. These meetings provided an opportunity to share information, discuss scenario development and data analysis, and review draft analyses of future supply and demand. A summary of the meetings is provided in Table 5-2. In addition, Metropolitan staff met with member agency staff individually upon request.

Using the requirements for the UWMP, Metropolitan analyzed the data provided by the member agencies, other regional planning organizations such as SCAG and SANDAG, the California Department of Water Resources, and the U.S. Bureau of Reclamation. Local and imported water supplies were included, as well as demand management programs, regulations, and public acceptance of conservation as a way of life. Metropolitan prepared the data in five-year increments for conditions under normal water year, single dry year, and for droughts lasting at least five years, as required in CWC Section 10631. The analyses were shared with the member agencies for their feedback and to assist with their preparation and adoption of their plans. When requested, Metropolitan staff met individually with the member agencies to review the data sets and discuss any agency-specific questions or issues. Regional issues and analysis methodologies were discussed during the technical coordination workshops in May and November 2025. Preliminary estimates of demand and supply were included in the draft 2025 UWMP distributed to the member agencies in December 2025. Further refinements of demand and supply estimates were included in the Public Review draft of the 2025 UWMP that was prominently posted on Metropolitan's website in February 2026.

2025 UWMP and WSCP Public Notice and Adoption

CWC Section 10632 requires urban water suppliers to prepare a detailed WSCP. While the WSCP is its own independent plan that may be revised at any point in time, it was initially included as part of the 2020 UWMP.

Metropolitan provided notice of the availability of the draft 2025 UWMP and the WSCP, and notice of the public hearing to consider adoption of both plans, in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The public review drafts of the 2025 UWMP and updated WSCP were posted prominently on

Metropolitan's website, mwdh2o.com, on February 6, 2026, more than 60 days in advance of the public hearing on April 13, 2026. The notice of availability of the documents was sent to Metropolitan's member agencies, as well as to cities and counties in Metropolitan's service area. In addition, a public notice advertising the public hearing was published in 11 Southern California newspapers. The notification in newspapers was published on February 23 and March 2, 2026. The notification was also published in February and March in Spanish-language newspapers, satisfying the requirement for non-English language notification. Copies of: (1) the notification letter sent to the cities and counties in Metropolitan's service area, and (2) the notice published in the newspapers are included in this section. Table 5-3 provides a list of participating member agencies and other appropriate agencies that Metropolitan coordinated with in its regional planning, as well as the cities and counties that were notified about the preparation of its 2025 UWMP and WSCP. The list of newspaper publications is included in Table 5-4. In addition, Metropolitan shared information on its social media platforms from March 16 to April 9, 2026 to inform the public about the opportunity to review the draft 2025 Urban Water Management Plan and the updated Water Shortage Contingency Plan. The public was invited to provide input at the public hearing on April 13, 2026, or to submit written comments.

Metropolitan held the public hearing for the draft 2025 UWMP and draft WSCP on April 13, 2026, at the Board's Water One Water and Adaptation Committee meeting. On May 12, 2026, Metropolitan's Board determined that the 2025 UWMP and the WSCP are consistent with the Act and accurately represent the water resources plan for Metropolitan's service area. In addition, Metropolitan's Board determined that Appendix 10 to the 2025 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003) which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in Resolutions XXXX, and XXXX, the Board adopted the 2025 UWMP and updated WSCP, and authorized their submittal to the State of California. Copies of Resolutions XXXX and XXXX are included in this section.

Submission and Availability of Final 2025 UWMP and WSCP

In fulfillment of CWC Sections 10632(c) and 10645(a) and (b), Metropolitan's final 2025 UWMP, and its updated WSCP were posted on the mwdh2o.com website in May 2026, following their adoption by the Metropolitan Board. This satisfies the requirement to make the plans available for public review and to make the WSCP available to Metropolitan's customers (which are its member agencies).

In fulfillment of CWC Sections 10632(c), 10635(c), and 10644(a)(1), Metropolitan also mailed copies of the final 2025 UWMP and updated WSCP (in electronic PDF format) to the California State Library and all cities and counties within Metropolitan's service area within 30 days of Board adoption.
In fulfillment of CWC Section 10621(f) and Sections 10644(a)(1), (2), and (b), Metropolitan's final 2025 UWMP, and updated WSCP were electronically submitted to the State of California through DWR's WUE data website https://wuedata.water.ca.gov/secure/ in June 2026.

Table 5-2
Member Agency Participation

Date	Group	Topic
May 18, 2025	Member Agency UWMP Coordinators and Consultants	UWMP Member Agency Coordination Meeting #1 – Kickoff of UWMP Process
May 2, 2025	Member Agency Managers Meeting	Monthly UWMP technical coordination update
May 29, 2025	Member Agency Managers Meeting	Monthly UWMP technical coordination update
June 27, 2025	Member Agency Managers Meeting	Monthly UWMP technical coordination update
July 25, 2025	Member Agency Managers Meeting	Monthly UWMP technical coordination update
August 22, 2025	Member Agency Managers Meeting	Monthly UWMP technical coordination update
September 19, 2025	Member Agency Managers Meeting	Monthly UWMP technical coordination update
November 14, 2025	Member Agency UWMP Coordinators, Sanitation Districts, Groundwater Managers	UWMP Member Agency Coordination Meeting #2 – Discussion of Preliminary UWMP assumptions and analysis results
November 20, 2025	Member Agency Managers Meeting	Monthly UWMP technical coordination update
December 12, 2025	Member Agency Managers Meeting	Monthly UWMP technical coordination update
January 15, 2026	Member Agency Managers Meeting	Monthly UWMP technical coordination update
February 20, 2026	Member Agency Managers Meeting	Monthly UWMP technical coordination update
March 20, 2026	Member Agency Managers Meeting	Monthly UWMP technical coordination update

Table 5-3
Water Supplier Information Exchange

6 Counties			
Los Angeles	Orange	Riverside	San Bernardino
San Diego	Ventura		
188 Cities			
Agoura Hills	Diamond Bar	Lawndale	Riverside
Alhambra	Downey	Loma Linda	Rolling Hills
Aliso Viejo	Duarte	Lomita	Rolling Hills Estates
Anaheim	Eastvale	Lompoc	Rosemead
Arcadia	El Monte	Long Beach	San Bernardino
Arroyo Grande	El Segundo	Los Alamitos	San Clemente
Artesia	Fillmore	Los Angeles	San Dimas
Atascadero	Fontana	Lynwood	San Fernando
Avalon	Fountain Valley	Malibu	San Gabriel
Azusa	Fullerton	Manhattan Beach	San Jacinto
Baldwin Park	Garden Grove	Maywood	San Juan Capistrano
Banning	Gardena	Menifee	San Luis Obispo
Beaumont	Glendale	Mission Viejo	San Marino
Bell	Glendora	Monrovia	Santa Ana
Bell Gardens	Goleta	Montclair	Santa Barbara
Bellflower	Grand Terrace	Montebello	Santa Clarita
Beverly Hills	Grover Beach	Monterey Park	Santa Fe Springs
Blythe	Guadalupe	Moorpark	Santa Maria
Bradbury	Hawaiian Gardens	Moreno Valley	Santa Monica
Brea	Hawthorne	Morro Bay	Santa Paula
Buellton	Hemet	Murrieta	Seal Beach
Buena Park	Hermosa Beach	Newport Beach	Sierra Madre
Burbank	Hidden Hills	Norco	Signal Hill
Calabasas	Highland	Norwalk	Simi Valley
Calimesa	Huntington Beach	Ojai	Solvang
Camarillo	Huntington Park	Ontario	South El Monte
Canyon Lake	Indian Wells	Orange	South Gate
Carpinteria	Indio	Oxnard	South Pasadena
Carson	Inglewood	Palm Desert	Stanton
Cathedral City	Irvine	Palm Springs	Temecula
Cerritos	Irwindale	Palos Verdes Estates	Temple City
Chino	Jurupa Valley	Paramount	Thousand Oaks
Chino Hills	La Canada Flintridge	Pasadena	Torrance
City Of Industry	La Habra	Paso Robles	Tustin
Claremont	La Habra Heights	Perris	Upland
Coachella	La Mirada	Pico Rivera	Ventura
Colton	La Palma	Pismo Beach	Vernon
Commerce	La Puente	Placentia	Villa Park
Compton	La Quinta	Pomona	Walnut

Table 5-3
Water Supplier Information Exchange (continued)

Corona	La Verne	Port Hueneme	West Covina
Costa Mesa	Laguna Beach	Rancho Cucamonga	West Hollywood
Covina	Laguna Hills	Rancho Mirage	Westlake Village
Cudahy	Laguna Niguel	Rancho Palos Verdes	Westminster
Culver City	Laguna Woods	Rancho Santa Margarita	Whittier
Cypress	Lake Elsinore	Redlands	Wildomar
Dana Point	Lake Forest	Redondo Beach	Yorba Linda
Desert Hot Springs	Lakewood	Rialto	Yucaipa
26 Member Agencies			
Anaheim	Foothill MWD	Municipal Water District of Orange County	Three Valleys MWD
Beverly Hills	Fullerton	Pasadena	Torrance
Burbank	Glendale	San Diego County Water Authority	Upper San Gabriel Valley MWD
Calleguas MWD	Inland Empire Utilities Agency	San Fernando	West Basin MWD
Central Basin MWD	Las Virgenes MWD	San Marino	Western MWD
Compton	Long Beach	Santa Ana	
Eastern MWD	Los Angeles	Santa Monica	
9 Groundwater Basin Management Organizations			
Santa Margarita River Watermaster	Ventura County Watershed Protection District	Water Replenishment District	Upper Los Angeles River Area Watermaster
San Bernardino County Flood Control District	Chino Basin Watermaster	Main San Gabriel Basin Watermaster/	Orange County Water District
Raymond Basin Management Board			
Other Agencies / Planning Organizations			
Camarillo Sanitary District	Camrosa Water District	City of Los Angeles, Bureau of Sanitation	City of San Diego Metropolitan Wastewater Dept.
El Toro Water District	Elsinore Valley Municipal Water District	Encina Wastewater Authority	Inland Empire Utilities Agency
Irvine Ranch Water District	Triunfo Water & Sanitation District	Leucadia Wastewater District	Los Angeles County Sanitation District
Los Angeles County Dept. of Public Works Sewer Districts	Moulton Niguel Water District	Olivenhain Municipal Water District	Orange County Sanitation District
Rancho California Water District	San Diego County Association of Governments	San Elijo Joint Powers Authority	Santa Margarita Water District
South Orange County Wastewater Authority	Southern California Association of Governments	Vallecitos Water District	

Table 5-4
Newspaper Publication of Public Hearing Notification

English Language Newspapers		
Los Angeles County	Los Angeles Times	February 23 and March 2, 2026
Orange County	Orange County Register	February 23 and March 2, 2026
San Bernardino	San Bernardino Sun	February 23 and March 2, 2026
Ventura County	Ventura County Star	February 23 and March 2, 2026
Riverside County	Press Enterprise	February 23 and March 2, 2026
San Diego County	San Diego Union Tribune	February 23 and March 2, 2026
Spanish Language Newspapers		
Los Angeles County	La Opinion	February 23 and March 2, 2026
Orange County	La Opinion La Presna Hispana	February 23 and March 2, 2026 February 27 and March 6, 2026
San Bernardino	El Chicano	February 26 and March 5, 2026
Ventura County	Vida	February 26 and March 5, 2026
Riverside County	La Prensa Hispana	February 27 and March 6, 2026
San Diego County	Frontera	February 23 and March 2, 2026

(Notification per California Water Code § 10621(b) and § 10642)
Letter Notifying Cities and Counties

February 2, 2026 [Sent via U.S. Mail to City Managers, and County Administrators]

Notice of Public Hearing on The Metropolitan Water District of Southern California's Draft 2025 Urban Water Management Plan (UWMP) and Draft 2025 Update to the Water Shortage Contingency Plan

The Metropolitan Water District of Southern California (Metropolitan) cordially invites you to participate and provide comments at a public hearing on the draft 2025 Urban Water Management Plan (UWMP) and draft Water Shortage Contingency Plan (WSCP). The UWMP presents Metropolitan's long-term plan for ensuring water supply reliability and water quality for the region. The draft 2025 UWMP complies with California state law requiring urban water suppliers to prepare and update urban water management plans every five years. The draft WSCP includes Metropolitan's efficient management and planned actions to respond to actual water shortage conditions. Metropolitan's WSCP complies with the requirements of the California Water Code. The public hearing will be held as part of the meeting of the One Water and Adaptation Committee whose board members are helping to shape a public dialogue on the future of water management and conservation in the region. The meeting details are as follows:

The Metropolitan Water District of Southern California
700 North Alameda Street, Los Angeles, CA 90012
One Water and Adaptation Committee Meeting
Monday, April 13, 2026, at 12:30 PM (expected time; please confirm time 7 days prior to meeting)

The One Water and Adaptation Committee meeting will be live streamed and recorded and may be accessed using the following link:
https://mwdh2o.legistar.com/Calendar.aspx
(Please check this website for the final time of the Public Hearing.)

The draft UWMP and draft WSCP are anticipated to be posted in the first week of February on Metropolitan's website https://www.mwdh2o.com/how-we-plan/#urban-water-management-plan, for your review. Public input is encouraged and will be considered during finalization of the 2025 UWMP and WSCP. Written comments are due by **April 13, 2026**.

If you have questions or comments, please contact us at uwmp2025@mwdh2o.com.

Very Truly Yours,
Brandon Goshi
Manager, Water Resource Management Group

(Published February 23 and March 2, 2026 (English newspapers) and February 23/26/27 and March 2/5/6, 2026 (Spanish newspapers) per Cal. Wat. Code § 10642, Gov't Code §§ 6066; 7290, et seq .)

PUBLIC HEARING SCHEDULED ON

DRAFT 2025 URBAN WATER MANAGEMENT PLAN AND DRAFT 2025 WATER SHORTAGE CONTINGENCY PLAN

The Metropolitan Water District of Southern California (Metropolitan) will hold a public hearing on **Monday, April 13, 2026,** to receive comments on its draft 2025 Urban Water Management Plan (UWMP) and its draft 2025 Water Shortage Contingency Plan (WSCP).

The hearing will be held during Metropolitan's One Water and Adaptation Committee meeting. The meeting is at:

Metropolitan Headquarters
700 N Alameda St, Los Angeles, CA 90012
One Water and Adaptation Committee Meeting
Monday, April 13, 2026, at 12:30 PM (expected time; please confirm 7 days before)

The One Water and Adaptation Committee meeting will be live streamed, recorded, and accessible here:
https://mwdh2o.legistar.com/Calendar.aspx
(Please check this website for the final time of the Public Hearing)

The UWMP demonstrates Metropolitan's long-term water supply reliability in normal, single-dry, and multiple-dry water years and is updated every five years in compliance with state law. The WSCP details Metropolitan's plans to respond to actual water shortage conditions in compliance with state law.

The draft UWMP and WSCP are available on Metropolitan's website, https://www.mwdh2o.com/how-we-plan. Public input is encouraged and will be considered before finalizing the UWMP and WSCP. Metropolitan will also accept written comments received by **April 13, 2026**.

To comment or for more information on the UWMP and WSCP, please contact David Sumi of Metropolitan's Water Resource Management Group at uwmp2025@mwdh2o.com.

Resolution XXXX

**RESOLUTION
OF THE BOARD OF DIRECTORS
OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
ADOPTING THE 2025 URBAN WATER MANAGEMENT PLAN**

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, an urban water management plan every five years; and

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting such urban water management plans; and

WHEREAS, the Board of Directors of The Metropolitan Water District of Southern California has duly reviewed, discussed, and considered Metropolitan's 2025 Urban Water Management Plan and has determined the 2025 Urban Water Management Plan to be consistent with the Urban Water Management Planning Act and to be an accurate representation of water resources planning for The Metropolitan Water District of Southern California.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of The Metropolitan Water District of Southern California that, on May 12, 2026, this District hereby adopts this 2025 Urban Water Management Plan for submittal to the State of California.

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of a resolution adopted by the Board of Directors of The Metropolitan Water District of Southern California, at its meeting held on May 12, 2026.

_____
Secretary of the Board of Directors
of The Metropolitan Water District
of Southern California

Resolution XXXX

**RESOLUTION
OF THE BOARD OF DIRECTORS
OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
ADOPTING THE WATER SHORTAGE CONTINGENCY PLAN**

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, a water shortage contingency plan;

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting such water shortage contingency plans; and

WHEREAS, the Board of Directors of The Metropolitan Water District of Southern California has duly reviewed, discussed, and considered Metropolitan's updated Water Shortage Contingency Plan and has determined the Water Shortage Contingency Plan to be consistent with the Urban Water Management Planning Act and to be an accurate representation of the planned actions during shortage conditions for The Metropolitan Water District of Southern California.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of The Metropolitan Water District of Southern California that, on May 12, 2026, this District hereby adopts this update of its Water Shortage Contingency Plan for submittal to the State of California.

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of a resolution adopted by the Board of Directors of The Metropolitan Water District of Southern California, at its meeting held on May 12, 2026.

_____
Secretary of the Board of Directors
of The Metropolitan Water District
of Southern California

Appendix 1

DEMAND FORECAST

Appendix 1
DEMAND FORECAST

Forecast Overview

Demand forecasting is essential for planning total water requirements in the Metropolitan's service area. In Metropolitan's service area, there are municipal and industrial (M&I) demand, agricultural demand, seawater barrier demand, and replenishment demand. These demands can be met with local supplies and/or imported supplies, and they can be reduced through conservation. As a wholesale imported water supplier, Metropolitan's long-term plans focus on the future demands for Metropolitan's supplies.

This appendix focuses on forecasting retail M&I demand, the largest share of the four demand types:

1. Retail Municipal and Industrial Demand – Retail M&I demands represent urban water use within the region, including residential, commercial, industrial, and institutional water uses. To forecast retail M&I demands, Metropolitan uses econometric models that have been adapted for conditions in Southern California. The econometric models are statistical models that can capture and explain the impacts of long-term socioeconomic trends on retail M&I demands. The econometric models incorporate projections of demographic and economic variables from regional transportation planning agencies to produce forecasts of water demand.
2. Retail Agricultural Demand – Retail agricultural demands consist of water use for irrigating crops. Metropolitan's member agencies provide projections of agricultural water use based on factors such as farm acreage, crop types, historical water use, and land use conversion. Metropolitan relies on member agencies' projections of agricultural demands.
3. Seawater Barrier Demand – Seawater barrier demands represent the amount of water needed to hold back seawater intrusion into the coastal groundwater basins. Groundwater management agencies determine the barrier requirements based on groundwater levels, injection wells, and regulatory permits.
4. Replenishment Demand – Replenishment demands represent the amount of water agencies plan to use to replenish their groundwater basins or surface reservoirs to maintain sustainable basin health and production.

Retail M&I Demand Forecast

In forecasting retail M&I water demand, Metropolitan utilizes MWD-EDM. MWD-EDM is a proprietary econometric model developed by The Brattle Group for Metropolitan. MWD-EDM is based on multiple regressions, which are generally favored by academics and practitioners for long-term water demand analysis. It uses water demand relationships based on actual observed behavior to consider the effect of anticipated changes in demand factors on long-term demand.

MWD-EDM is comprised of three separate regression models described below. Each model is developed using historical water consumption, demographic, economic, and weather data specific to the sector:

- Single-Family Residential (SFR) Model – SFR water demand is modeled as a function of price, weather, retailer-level housing, demographic characteristics, and member agency-level fixed effects. The model used water consumption data from 153 retailers with 3,000 or more accounts in Metropolitan's service area. The dataset, spanning from 1994 to 2011, consisted of 1,225 observations and represented 80 percent of all SFR accounts from all 26 Metropolitan member agencies.
- Multi-family Residential (MFR) Model – MFR demand is modeled as a function of price, retailer-level housing, demographic characteristics, and member agency-level fixed effects. Water consumption data from 1994 to 2011, was collected from 53 water retailers, which consisted of 469 observations from 23 out of 26 Metropolitan member agencies.
- Commercial, Industrial, and Institutional (CII) Model – CII demand is modeled as a function of price, weather, employment, the share of employment in the manufacturing sector, and member agency-level fixed effects. Water consumption data from 1994 to 2011, was collected from 75 water retailers, which included 709 observations from 25 out of 26 Metropolitan member agencies.

The SFR and MFR models forecast average monthly household consumption, while the CII model forecasts average monthly consumption per employee. Table A.1-1 shows the dependent and the independent variables used in the econometric models for each sector.

Table A.1-1
MWD-EDM Variables

Sector	Dependent Variable	Independent Variable
SFR	Water Use Per Household	Total Average Cost Total Average Cost x Median Lot Size Annual Precipitation Average Max Temperature Median Income Average Household Size Median Lot Size
MFR	Water Use Per Household	Median Tier Price Median Income Median Lot Size Average Household Size
CII	Water Use Per Employee	Median Tier Price Cooling Degree Days Average Max Temperature Share of Employment in Manufacturing Median Tier Price x Share of Manufacturing

Total retail M&I demand is the product of projected household/employee and the average monthly consumption.

Demographics

Demographics are recognized by the water industry as drivers of water demand. Metropolitan's retail demand modeling is driven by key demographics such as projected population, households, employment, and median household income.

Metropolitan does not forecast future population growth but relies on demographic growth projections produced by two regional transportation planning agencies as inputs to MWD-EDM: Southern California Association of Governments (SCAG) and San Diego Association of Governments (SANDAG). Together, they represent over 200 cities in Southern California and develop long-term transportation plans for sustainable communities. SCAG is the regional planning agency for six counties: Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. SANDAG is the regional planning agency for San Diego County.

Both planning agencies update their regional growth forecasts approximately every four years, at different times. For Metropolitan's 2025 Urban Water Management Plan, Metropolitan utilized SCAG's RTP-2024 and SANDAG's Series 15 demographic growth projections. SCAG and SANDAG worked with demographers, economists, and local governments to consider and incorporate national and regional trends, and land use information from local general plans. SCAG's and SANDAG's projections also underwent extensive local review and are backed by Environmental Impact Reports.

Metropolitan's use of SCAG's and SANDAG's projections is consistent with California Water Code Section 10631's requirement for suppliers to include current and projected land uses within the existing or anticipated service area affecting the supplier's water management planning.

Trends in Southern California

Population

In 2025, the population in Metropolitan's service area was approximately 18.8 million. By 2050, the population is projected at 20.4 million. The historical and projected population for the service area, by county, is shown in Figure A.1-1. While Los Angeles County leads in total population, the inland areas of Riverside and San Bernardino counties are projected to grow at higher rates over the 25-year planning horizon. Overall, slower annual population growth rates were projected for all counties due to lower birth rates, higher mortality rates of an aging population, and low immigration. The lower growth rates also reflect the high cost of living and housing shortage that limit population growth.

Employment

Over the 25-year planning horizon, the highest employment growth is expected to occur in Los Angeles, Riverside, and San Diego counties. Los Angeles and Riverside counties together are projected to add more than 372,000 jobs per year, and San Diego is projected to add nearly 150,000 jobs per year.

Figure A.1-2 and Table A.1-3 illustrate the urban employment projection in Metropolitan's service area. According to the California Employment Development Department (EDD), the urban employment in Metropolitan's service area was approximately 9.9 million in 2024. Total urban employment is projected to increase to about 10.5 million in 2050, according to

SCAG and SANDAG's forecasts. This increase of about 7.1 percent is less than the projected population increase of 8.5 percent, suggesting a slight decrease in the employed population over time due to an aging population.

Figure A.1-1: Actual and Projected Population

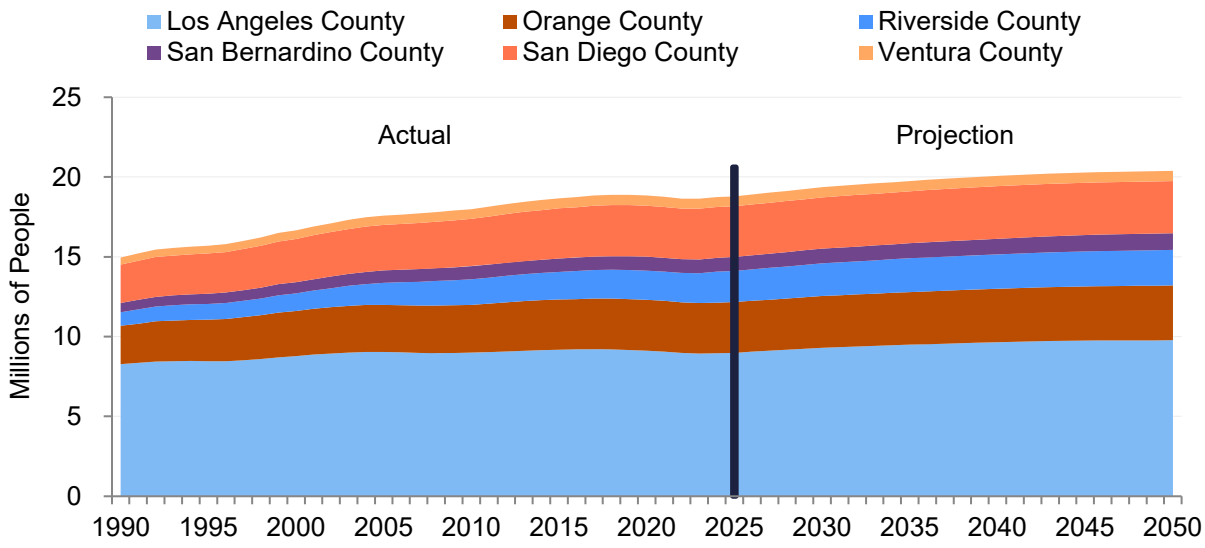
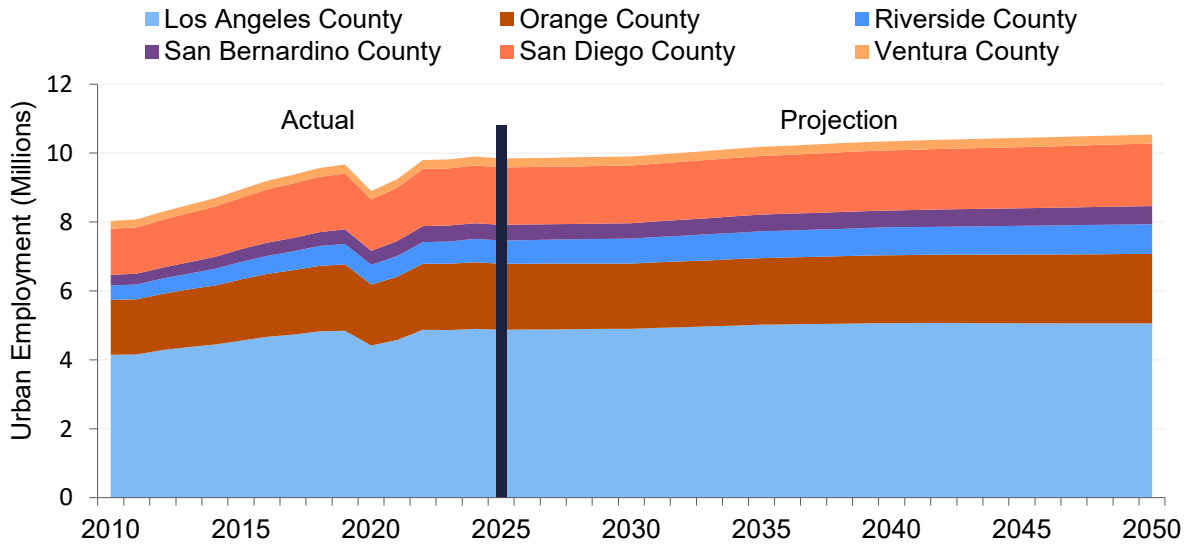


Figure A.1-2: Actual and Projected Urban Employment



Residential Households

SCAG and SANDAG forecasted residential housing growth in all parts of the Metropolitan service area. These forecasts are shown in Figure A.1-3 and Table A.1-4. The total occupied housing units are projected to increase by 17 percent between 2025 and 2050, from 6.6 to around 7.7 million households. Much of this growth will likely occur in inland areas of Metropolitan's service area. The household size (household population divided by total occupied dwelling units) is projected to decline from about 2.8 persons per household in 2025 to 2.6 persons per household by 2050.

New residential housing units added to the region are another indicator of the future growth in water demand. The mix of housing types has implications for growth in outdoor water use, since multi-family units tend to use less water on a per-unit basis than single-family dwellings. Figure A.1-4 shows the annual housing growth by housing type between 2001 and 2025.

Figure A.1-3: Actual and Projected Households

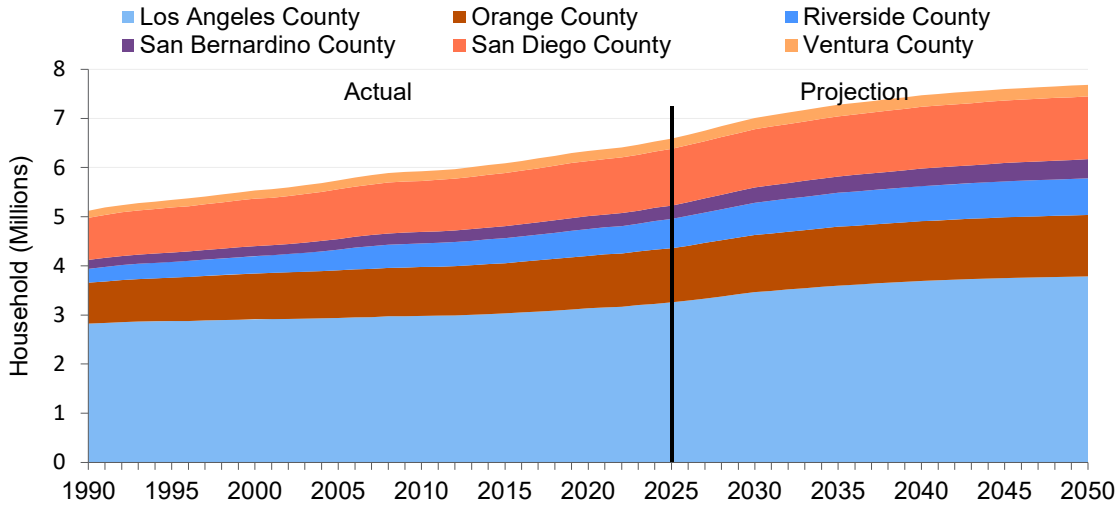
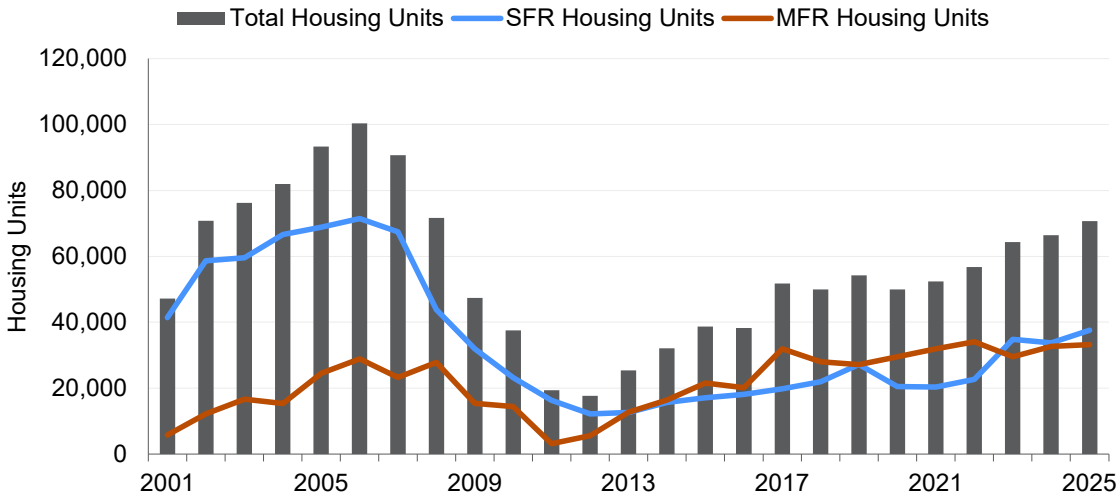


Figure A.1-4: Residential Housing Growth



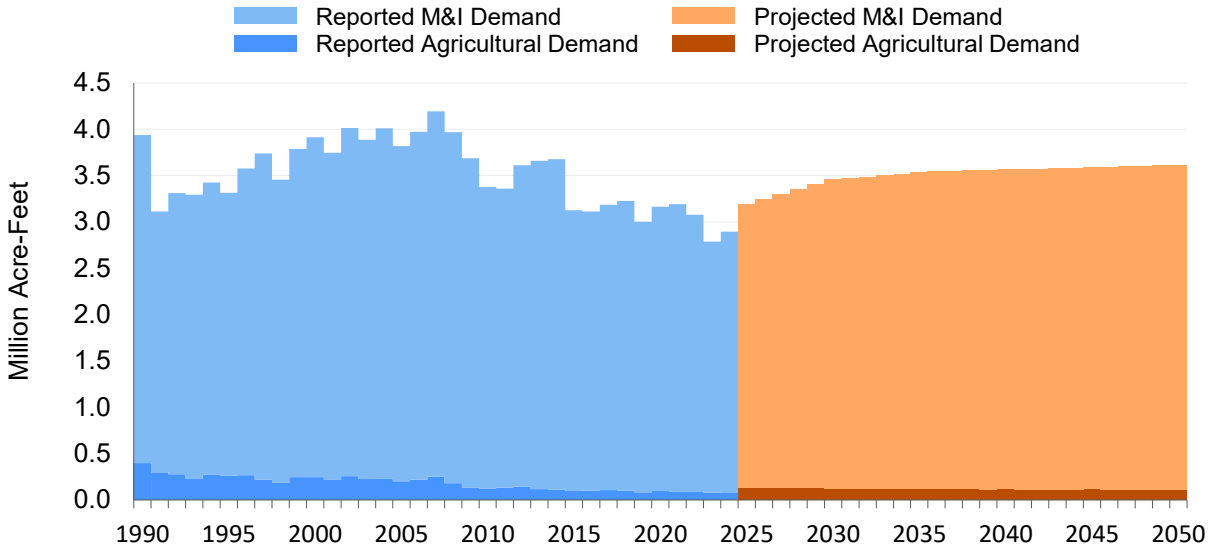
M&I Demand

As shown in Figure A.1-5, actual M&I water demand in 2024 was 2.81 million acre-feet (MAF). M&I water demands are relatively low in recent years due to several factors, including water-use restriction in 2022, followed by wet conditions in 2023. M&I demand is projected to increase to 3.5 MAF in 2050, driven by population and economic growth, and continued improvements in water-use efficiency.

By County

M&I demand is not expected to grow uniformly across counties. Consistent with the general pattern of projected demographic distributions, the largest increases are expected to occur in Los Angeles and Riverside Counties, with increases of about 296 thousand acre-feet (TAF) and 112 TAF between 2024 and 2050, respectively.

Figure A.1-5: Actual and Projected Retail Water Demand



Conservation Savings

Conservation savings are a comprehensive representation of conservation activities, including Metropolitan's Conservation Credits Programs (CCP), code-based conservation savings due to plumbing codes, and price-effect savings from water rate structure. Table A.1-8 shows estimated conservation savings in Metropolitan's service area. Water savings from the CCP are estimated at 208 TAF in savings during fiscal year 2024-25 and nearly 4.32 MAF in cumulative conservation savings since fiscal year 1990-91.

Table A.1-2: Population Growth in Metropolitan's Service Area

	Actual						Projection				
County	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Los Angeles County	8,777,000	9,037,000	8,989,000	9,189,000	9,126,000	8,988,000	9,301,000	9,497,000	9,654,000	9,756,000	9,775,000
Orange County	2,832,000	2,954,000	3,004,000	3,145,000	3,188,000	3,175,000	3,245,000	3,297,000	3,353,000	3,398,000	3,435,000
Riverside County	1,103,000	1,379,000	1,607,000	1,723,000	1,828,000	1,949,000	2,054,000	2,113,000	2,154,000	2,196,000	2,225,000
San Bernardino County	701,000	776,000	807,000	839,000	864,000	876,000	913,000	942,000	985,000	1,023,000	1,056,000
San Diego County	2,704,000	2,857,000	2,971,000	3,144,000	3,202,000	3,186,000	3,208,000	3,264,000	3,294,000	3,279,000	3,264,000
Ventura County	535,000	581,000	614,000	635,000	631,000	620,000	640,000	644,000	645,000	643,000	640,000
Metropolitan's Service Area	**16,652,000**	**17,584,000**	**17,992,000**	**18,675,000**	**18,839,000**	**18,794,000**	**19,361,000**	**19,757,000**	**20,085,000**	**20,295,000**	**20,395,000**

Notes:
Totals may not foot due to rounding differences.
Source: US Census, CA Department of Finance, SCAG's Regional Transportation Plan (RTP-24), and SANDAG's Series 15 Growth Forecast.

Table A.1-3: Urban Employment Growth in Metropolitan's Service Area

	Actual				Projection				
County	2010	2015	2020	2024*	2030	2035	2040	2045	2050
Los Angeles County	4,148,000	4,557,000	4,418,000	4,895,000	4,900,000	5,016,000	5,067,000	5,060,000	5,057,000
Orange County	1,589,000	1,778,000	1,767,000	1,941,000	1,896,000	1,941,000	1,976,000	1,997,000	2,018,000
Riverside County	418,000	508,000	571,000	671,000	725,000	769,000	803,000	830,000	859,000
San Bernardino County	310,000	368,000	410,000	454,000	445,000	484,000	490,000	509,000	529,000
San Diego County	1,334,000	1,492,000	1,491,000	1,672,000	1,668,000	1,702,000	1,747,000	1,779,000	1,811,000
Ventura County	229,000	245,000	239,000	262,000	264,000	267,000	267,000	266,000	264,000
Metropolitan's Service Area	**8,028,000**	**8,948,000**	**8,896,000**	**9,895,000**	**9,898,000**	**10,179,000**	**10,350,000**	**10,441,000**	**10,538,000**

Notes:
Totals may not foot due to rounding differences.
* 2025 actuals were not available at the time of report preparation.
Source: Actual employment data based on the California EDD. Projections based on SCAG's RTP-24 and SANDAG's Series 15.

Table A.1-4: Occupied Housing Growth in Metropolitan's Service Area

(Households)

	Actual						Projection				
County	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Los Angeles County	2,910,000	2,937,000	2,980,000	3,033,000	3,133,000	3,252,000	3,464,000	3,598,000	3,694,000	3,755,000	3,781,000
Orange County	935,000	971,000	992,000	1,022,000	1,072,000	1,106,000	1,163,000	1,196,000	1,214,000	1,233,000	1,253,000
Riverside County	353,000	421,000	482,000	511,000	546,000	597,000	657,000	691,000	714,000	734,000	748,000
San Bernardino County	203,000	217,000	232,000	244,000	259,000	268,000	312,000	334,000	354,000	371,000	385,000
San Diego County	962,000	1,010,000	1,043,000	1,080,000	1,123,000	1,155,000	1,184,000	1,224,000	1,258,000	1,270,000	1,282,000
Ventura County	169,000	184,000	195,000	199,000	205,000	210,000	228,000	234,000	236,000	236,000	235,000
Metropolitan's Service Area	**5,532,000**	**5,740,000**	**5,924,000**	**6,089,000**	**6,338,000**	**6,588,000**	**7,008,000**	**7,277,000**	**7,470,000**	**7,599,000**	**7,684,000**

Notes: Totals may not foot due to rounding differences.
Source: US Census, CA Department of Finance, SCAG's Regional Transportation Plan (RTP-24), and SANDAG's Series 15 Growth Forecast.

Table A.1-5: Total Retail Demand in Metropolitan's Service Area with Conservation

M&I and Agricultural uses (Acre-Feet)

	Actual						Projection				
County	**2000**	**2005**	**2010**	**2015**	**2020**	**2024***	**2030**	**2035**	**2040**	**2045**	**2050**
Los Angeles County	1,740,000	1,655,000	1,430,000	1,314,000	1,324,000	1,190,000	1,434,000	1,468,000	1,482,000	1,487,000	1,486,000
Orange County	660,000	631,000	545,000	503,000	536,000	486,000	561,000	568,000	569,000	570,000	573,000
Riverside County	474,000	492,000	472,000	423,000	457,000	447,000	537,000	556,000	565,000	575,000	586,000
San Bernardino County	250,000	261,000	246,000	203,000	235,000	192,000	234,000	243,000	245,000	253,000	261,000
San Diego County	659,000	621,000	533,000	557,000	473,000	462,000	535,000	541,000	546,000	547,000	553,000
Ventura County	132,000	156,000	152,000	125,000	139,000	119,000	158,000	159,000	158,000	157,000	157,000
Metropolitan's Service Area	**3,915,000**	**3,816,000**	**3,378,000**	**3,125,000**	**3,164,000**	**2,896,000**	**3,459,000**	**3,535,000**	**3,565,000**	**3,589,000**	**3,616,000**

Notes:
Totals may not foot due to rounding differences.
* 2025 actuals were not available at the time of report preparation.
Total Retail Demand is the sum of retail demand for municipal, industrial, and institutional uses and agricultural uses.

Table A.1-6: Total Retail M&I Demand in Metropolitan's Service Area with Conservation

(Acre-Feet)

	Actual						Projection				
County	**2000**	**2005**	**2010**	**2015**	**2020**	**2024***	**2030**	**2035**	**2040**	**2045**	**2050**
Los Angeles County	1,738,000	1,653,000	1,429,000	1,313,000	1,323,000	1,189,000	1,432,000	1,467,000	1,480,000	1,486,000	1,485,000
Orange County	643,000	621,000	543,000	499,000	530,000	485,000	559,000	566,000	567,000	568,000	571,000
Riverside County	360,000	417,000	409,000	380,000	408,000	400,000	463,000	481,000	491,000	501,000	512,000
San Bernardino County	247,000	250,000	217,000	176,000	213,000	174,000	224,000	237,000	244,000	252,000	260,000
San Diego County	554,000	530,000	515,000	550,000	466,000	455,000	518,000	524,000	529,000	530,000	536,000
Ventura County	124,000	144,000	140,000	109,000	126,000	109,000	139,000	140,000	140,000	138,000	138,000
Metropolitan's Service Area	**3,666,000**	**3,615,000**	**3,253,000**	**3,027,000**	**3,066,000**	**2,812,000**	**3,335,000**	**3,415,000**	**3,451,000**	**3,475,000**	**3,502,000**

Notes:
Totals may not foot due to rounding differences.
* 2025 actuals were not available at the time of report preparation.

Table A.1-7: Total Retail Agricultural Demand in Metropolitan's Service Area

(Acre-Feet)

	Actual						Projection				
County	**2000**	**2005**	**2010**	**2015**	**2020**	**2024***	**2030**	**2035**	**2040**	**2045**	**2050**
Los Angeles County	2,000	2,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Orange County	17,000	10,000	2,000	4,000	6,000	1,000	2,000	2,000	2,000	2,000	2,000
Riverside County	113,000	75,000	63,000	43,000	49,000	47,000	74,000	74,000	74,000	74,000	75,000
San Bernardino County	2,000	11,000	29,000	27,000	21,000	18,000	10,000	6,000	1,000	1,000	1,000
San Diego County	106,000	91,000	18,000	7,000	7,000	7,000	17,000	17,000	17,000	17,000	17,000
Ventura County	8,000	13,000	12,000	16,000	13,000	10,000	18,000	19,000	18,000	18,000	18,000
Metropolitan's Service Area	**248,000**	**202,000**	**125,000**	**98,000**	**97,000**	**84,000**	**122,000**	**119,000**	**113,000**	**113,000**	**114,000**

Notes:
* 2025 data not available.

Table A.1-8: Conservation Savings in Metropolitan's Service Area - 1980 Base Year

(Acre-Feet)

	Estimated								Projection				
County	**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Los Angeles County	0	77,000	157,000	222,000	282,000	353,000	416,000	445,000	471,000	488,000	513,000	539,000	563,000
Orange County	0	23,000	52,000	77,000	102,000	123,000	140,000	151,000	158,000	166,000	175,000	186,000	197,000
Riverside County	0	9,000	20,000	34,000	50,000	62,000	70,000	80,000	86,000	94,000	103,000	111,000	120,000
San Bernardino County	0	4,000	8,000	13,000	21,000	25,000	29,000	33,000	38,000	41,000	46,000	52,000	57,000
San Diego County	0	23,000	53,000	73,000	92,000	108,000	125,000	135,000	144,000	158,000	174,000	189,000	203,000
Ventura County	0	4,000	8,000	12,000	15,000	19,000	22,000	25,000	27,000	29,000	31,000	33,000	35,000
Active, Code and Price	**0**	**140,000**	**298,000**	**431,000**	**562,000**	**690,000**	**802,000**	**869,000**	**924,000**	**976,000**	**1,042,000**	**1,110,000**	**1,175,000**
Pre-1990 Conservation	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000
Total Conservation	**250,000**	**390,000**	**548,000**	**681,000**	**812,000**	**940,000**	**1,052,000**	**1,119,000**	**1,174,000**	**1,226,000**	**1,292,000**	**1,360,000**	**1,425,000**

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Appendix 2

EXISTING REGIONAL WATER SUPPLIES

Appendix 2
EXISTING REGIONAL WATER SUPPLIES

Water used in Metropolitan's service area comes from both local and imported sources. Local sources include groundwater, surface water, recycled water, and desalinated seawater. Sources of imported water include the Colorado River, the State Water Project (SWP), and the Owens Valley/Mono Basin. On average over the last ten years from 2015 to 2024, local sources met about 57 percent of the water needs, while imported sources supplied the remaining 43 percent.

The City of Los Angeles imports water from the Owens Valley/Mono Basin east of the Sierra Nevada through the Los Angeles Aqueduct (LAA). This water currently meets about six percent of the region's water needs based on a ten-year average (2015-2024), but is dedicated for use by the City of Los Angeles. Metropolitan provides imported water supplies to meet the remaining 43 percent of the region's water needs based on the same ten-year period. These imported supplies are received through Metropolitan's Colorado River Aqueduct (CRA) and the SWP's California Aqueduct. Table A.2-1 and Figure A.2-1 show the historical sources of local and imported supplies within Metropolitan's service area.

Table A.2-2 shows the quantities of Metropolitan water used by member agencies during the last ten years (2015-2024). Metropolitan's largest water customers are the San Diego County Water Authority (24 percent), City of Los Angeles (16 percent), and Municipal Water District of Orange County (11 percent).

The following sections describe the current supply sources in more detail. The main body of the Urban Water Management Plan contains descriptions of planned future supplies.

Local Water Supplies

Local sources of water available to the region include surface water, groundwater, recycled water, and seawater desalination. Some of the major river systems in Southern California have been developed into systems of dams, flood control channels, and percolation ponds for supplying local water and recharging groundwater basins. For example, the San Gabriel and Santa Ana Rivers effectively capture runoff in their respective watersheds. The Los Angeles River system, however, is not as efficient in capturing runoff. In its upper reaches, which make up 25 percent of the watershed, most runoff is captured with recharge facilities. In its lower reaches, which comprise the remaining 75 percent of the watershed, the river and its tributaries are lined with concrete, so there are no recharge facilities. The Santa Clara River in Ventura County is outside of Metropolitan's service area, but it replenishes groundwater basins used by water agencies within Metropolitan's service area. Other rivers in Metropolitan's service area, such as the Santa Margarita and San Luis Rey, are essentially natural replenishment systems.

Table A.2-1
Sources of Water Supply to the Metropolitan Service Area (Acre-Feet)

Calendar Year	Local Supplies[1]	L.A. Aqueduct	Colorado River[2]	State Water Project[3]	Total
1990	1,595,000	107,000	1,183,000	1,458,000	4,343,000
1991	1,547,000	181,000	1,252,000	625,000	3,605,000
1992	1,631,000	177,000	1,153,000	744,000	3,704,000
1993	1,546,000	289,000	1,144,000	663,000	3,642,000
1994	1,649,000	133,000	1,263,000	845,000	3,890,000
1995	1,719,000	444,000	933,000	451,000	3,546,000
1996	1,842,000	422,000	1,089,000	663,000	4,016,000
1997	1,902,000	436,000	1,125,000	724,000	4,187,000
1998	1,902,000	467,000	941,000	521,000	3,830,000
1999	2,034,000	309,000	1,072,000	792,000	4,206,000
2000	1,899,000	255,000	1,217,000	1,473,000	4,845,000
2001	1,846,000	267,000	1,245,000	1,119,000	4,477,000
2002	1,844,000	179,000	1,198,000	1,415,000	4,636,000
2003	1,790,000	252,000	676,000	1,561,000	4,278,000
2004	1,760,000	203,000	741,000	1,802,000	4,506,000
2005	1,758,000	369,000	707,000	1,525,000	4,358,000
2006	1,861,000	379,000	514,000	1,695,000	4,448,000
2007	1,984,000	129,000	696,000	1,648,000	4,457,000
2008	1,942,000	147,000	896,000	1,037,000	4,023,000
2009	1,959,000	137,000	1,044,000	908,000	4,048,000
2010	1,839,000	251,000	837,000	1,129,000	4,056,000
2011	1,779,000	355,000	445,000	1,379,000	3,959,000
2012	1,979,000	167,000	455,000	1,252,000	3,854,000
2013	1,963,000	65,000	986,000	974,000	3,988,000
2014	1,923,000	64,000	1,168,000	607,000	3,762,000
2015	1,714,000	33,000	1,178,000	593,000	3,517,000
2016	1,795,000	96,000	961,000	1,009,000	3,862,000
2017	1,751,000	380,000	282,000	1,473,000	3,886,000
2018	1,816,000	246,000	757,000	845,000	3,664,000
2019	1,727,000	344,000	298,000	1,232,000	3,601,000
2020	1,859,000	204,000	687,000	588,000	3,338,000
2021	1,825,000	62,000	1,061,000	606,000	3,553,000
2022	1,771,000	71,000	1,112,000	468,000	3,422,000
2023	1,702,000	299,000	436,000	1,116,000	3,553,000
2024	1,779,000	270,000	655,000	707,000	3,412,000
2025[4]	1,670,000	210,000	565,000	835,000	3,280,000

Notes:
Calendar year data. All data are subject to revision and reconciliation.

1. Local Supplies include local groundwater, surface water, recycled water, groundwater recovery, and seawater desalination used for MI, AG, SW, or GW recharge in the MWD service area. Santa Ana River Baseflow at Prado Dam included.
2. CR Supplies are gross Havasu diversions less return flows, deliveries to USBR, Mexico, and storage.
3. SWP Supplies include Table A, Art. 21, Art. 14(b), Art. 12(d), Art. 12(e), Art. 55, draws from storage & carryover, DWCV & other exchanges, transfers, Drought Water Bank and Dry Year Pool Purchases, Pools A&B, Flood Water, wheeling, Port Hueneme lease, and SBVMWD Purchases.
4. 2025 data for Local Supplies and Los Angeles Aqueduct were not available at the time of publication. Estimate is based on 2022 to 2024 average production and subject to future revision.

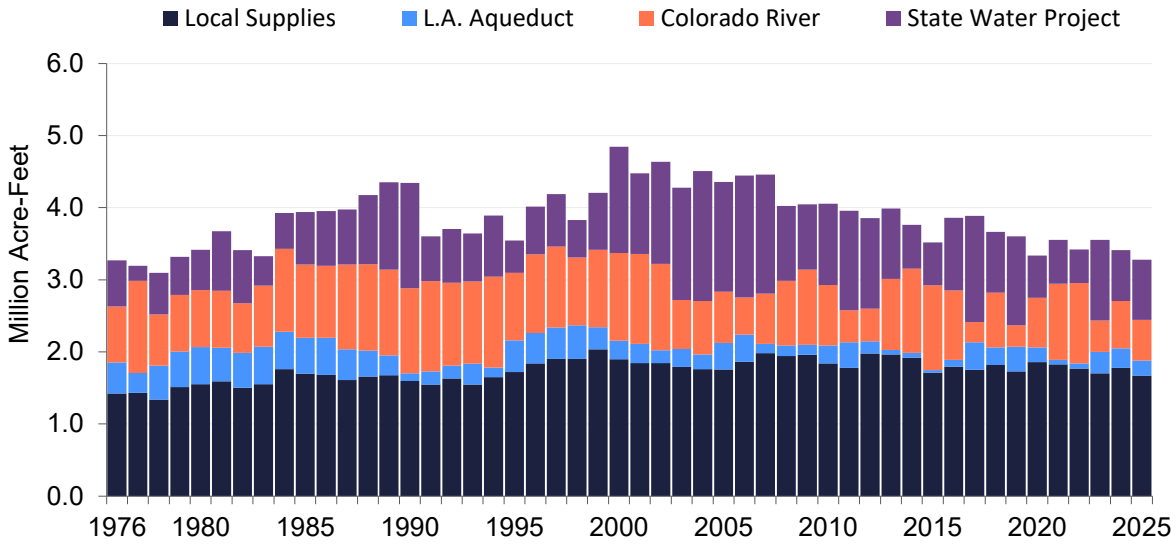
Table A. 2-2
Historical Metropolitan Water Deliveries to Member Agencies (Acre-Feet)

Member Agency	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025*
City of Anaheim	12,991	25,730	14,797	13,466	38,578	40,319	42,257	28,706	11,095	27,352
City of Beverly Hills	9,498	9,966	10,306	9,521	9,583	9,617	8,757	7,617	8,027	8,134
City of Burbank	12,128	19,033	12,037	18,250	6,317	9,332	3,111	5,793	4,665	4,523
Calleguas Municipal Water District	86,182	91,982	93,071	90,177	90,435	95,060	69,026	69,477	71,339	69,947
Central Basin Municipal Water District	60,904	24,123	24,418	16,681	20,821	26,485	25,615	23,805	23,377	24,266
City of Compton	3	3	18	38	0	2	0	18	17	12
Eastern Municipal Water District	83,858	89,418	93,297	86,981	92,066	92,405	96,321	81,746	95,732	91,266
Foothill Municipal Water District	7,297	9,039	8,456	7,218	8,832	10,426	8,570	6,247	7,844	7,553
City of Fullerton	5,417	9,040	6,664	5,057	5,963	6,484	5,782	5,019	6,106	5,635
City of Glendale	14,743	15,149	15,925	13,769	15,502	14,816	14,202	12,831	14,021	13,685
Inland Empire Utilities Agency	43,731	61,684	67,127	65,828	64,584	76,034	43,816	38,196	37,450	39,821
Las Virgenes Municipal Water District	18,153	18,314	20,438	17,379	20,276	20,428	13,600	15,208	14,375	14,394
City of Long Beach	28,242	23,707	26,144	24,577	30,249	20,929	24,677	22,053	19,774	22,168
City of Los Angeles	317,860	115,093	213,425	102,647	243,976	367,390	348,128	132,294	167,333	215,918
Municipal Water District of Orange County	196,024	236,477	212,744	143,271	133,426	177,796	172,339	96,520	111,699	126,853
City of Pasadena	17,376	18,377	20,096	19,691	17,940	21,765	18,332	16,011	14,901	16,415
San Diego County Water Authority	435,824	357,912	373,394	318,659	308,484	337,949	365,149	286,150	289,641	313,647
City of San Fernando	0	0	0	0	0	0	1,906	2,347	355	1,536
City of San Marino	972	962	954	962	1,601	962	962	963	987	971
City of Santa Ana	4,453	14,230	9,242	7,296	7,876	7,171	9,465	4,106	4,167	5,913
City of Santa Monica	2,904	4,131	4,037	3,020	5,424	5,295	6,438	9,785	8,005	8,076
Three Valleys Municipal Water District	67,246	59,668	67,343	70,794	61,842	64,563	54,404	50,016	55,647	53,356
City of Torrance	16,471	15,579	14,559	14,439	14,831	13,850	14,322	13,460	13,795	13,859
Upper San Gabriel Valley MWD	46,407	45,778	56,185	102,868	16,842	14,418	27,673	47,561	89,750	54,995
West Basin Municipal Water District	109,484	112,783	116,650	113,168	110,940	114,026	105,900	93,139	94,972	98,004
Western Municipal Water District	65,320	71,968	74,148	63,865	68,505	72,465	69,431	65,198	73,013	69,214
Total of All Agencies	**1,663,000**	**1,450,000**	**1,555,000**	**1,330,000**	**1,395,000**	**1,620,000**	**1,550,000**	**1,134,000**	**1,238,000**	**1,308,000**

Note:
* 2025 data not available. Used average of 2022-24 instead.

Local supplies fluctuate in response to variations in rainfall. During prolonged periods of below-normal rainfall, local water supplies decrease. Conversely, prolonged periods of above-normal rainfall increase local supplies. Sources of groundwater basin replenishment include local precipitation, runoff from the coastal ranges, and artificial recharge with imported water supplies. In addition to runoff, recycled water provides an increasingly important source of replenishment water for the region.

Figure A.2-1 Sources of Supply to Metropolitan's Service Area



Notes:
Calendar year data. All data are subject to revision and reconciliation.
Local Supplies includes local groundwater, surface water, recycled water, groundwater recovery, and seawater desalination used for MI, AG, SW, or GW recharge in the MWD service area. Santa Ana River Baseflow at Prado Dam included.
Colorado River Supplies are gross Havasu diversions less return flows, deliveries to USBR, Mexico, and storage.
SWP Supplies include Table A, Art. 21, Art. 14(b), Art. 12(d), Art. 12(e), Art. 55, draws from storage & carryover, DWCV & other exchanges, transfers, Drought Water Bank and Dry Year Pool Purchases, Pools A&B, Flood Water, wheeling, Port Hueneme lease, and SBVMWD Purchases.
2025 data for Local Supplies and Los Angeles Aqueduct were not available at the time of publication. Estimate is based on 2022 to 2024 average production and subject to future revision.

Major Groundwater Basins

From 2015 to 2024, groundwater sources accounted for an average of about 56 percent of the local water supplies, which are found in many basins throughout the Southern California region and provide an annual average total production of about 1.07 MAF per year. Figure A.2-2 shows the locations of the groundwater basins within Metropolitan's service area. Groundwater yield comes from passive recharge from the percolation of rainfall and stream runoff, and active recharge from spreading and injection of captured stormwater, recycled water, and imported water. In certain major drainage areas, runoff is retained in flood control reservoirs and released into spreading basins for percolation into the ground. In Los Angeles County, many groundwater recharge facilities located along the upper reaches of the Los Angeles River and San Gabriel River systems provide recharge

to San Fernando, Raymond, Main San Gabriel, Central, and West Coast groundwater basins. The Orange County Water District operates a system of diversion structures and recharge basins along the Santa Ana River that captures much of the storm runoff, as well as water from reclamation facilities in Riverside and San Bernardino counties. Storm runoff is also diverted to recharge basins in the Chino Basin. This water, which would otherwise flow into the Pacific Ocean, is allowed to percolate into the underlying aquifers so it may be pumped for local use when needed. Recycled water use for groundwater recharge has increased steadily. The Water Replenishment District of Southern California (WRD) has spread recycled water at the Montebello Forebay to recharge Central and West Coast basins for many years and has expanded this practice with the completion of the WRD Albert Robles Center for Water Recycling and Environmental Learning in 2019. The Inland Empire Utilities Agency (IEUA) provides recycled water for recharge of the Chino Basin. Orange County Water District has implemented the Groundwater Replenishment System to recharge highly treated recycled water to the Orange County Basin. Highly treated recycled water is also used at seawater barriers in the West Coast, Central, and Orange County basins and has largely replaced use of imported water for this purpose.

Almost all major groundwater basins in Southern California are either adjudicated or managed by special districts or agencies. Over 95 percent of the groundwater used in Metropolitan's service area is produced from adjudicated or managed groundwater basins. Adjudicated basins in the region include: Raymond Basin, Upper Los Angeles River Area basins (which include San Fernando, Sylmar, Verdugo, and Eagle Rock Basins), Main San Gabriel Basin, Puente Basin, Central Basin, West Coast Basin, Six Basins, Hemet-San Jacinto Basin, Chino Basin, and Cucamonga Basin. The Orange County Groundwater Basin is managed by Orange County Water District; portions of the Ventura County Basins are managed by the Fox Canyon Groundwater Management Agency; and the West San Jacinto Basins are managed by Eastern Municipal Water District.

In 2014, California enacted the Sustainable Groundwater Management Act (SGMA), which addresses groundwater overdraft to ensure long-term sustainable use of groundwater resources. The Department of Water Resources classified each groundwater basin as critical, high-priority, medium-priority, and low-priority. Under SGMA, all critical, high, and medium-priority basins were required to establish a Groundwater Sustainability Agency (GSA) to prepare a Groundwater Sustainability Plan (GSP). Adjudicated basins were classified as low-priority and, therefore, would not be required to prepare a GSP. As of 2025, 11 medium or high-priority basins within Metropolitan's service area have prepared a GSP, two very low to low-priority priority basins that elected to prepare a GSP (Spadra Basin and Arroyo Santa Rosa Valley Basin), and one medium-priority basin that submitted an alternative plan (Coastal Plain of Orange County Basin). In general, these GSPs include actions to address recharge, groundwater pumping, protection against seawater intrusion in the coastal regions, water quality deterioration, and excessive lowering of water levels. Groundwater basin managers also address treatment of contamination, manage recharge and storage programs, and monitor extraction, water levels, and water quality.

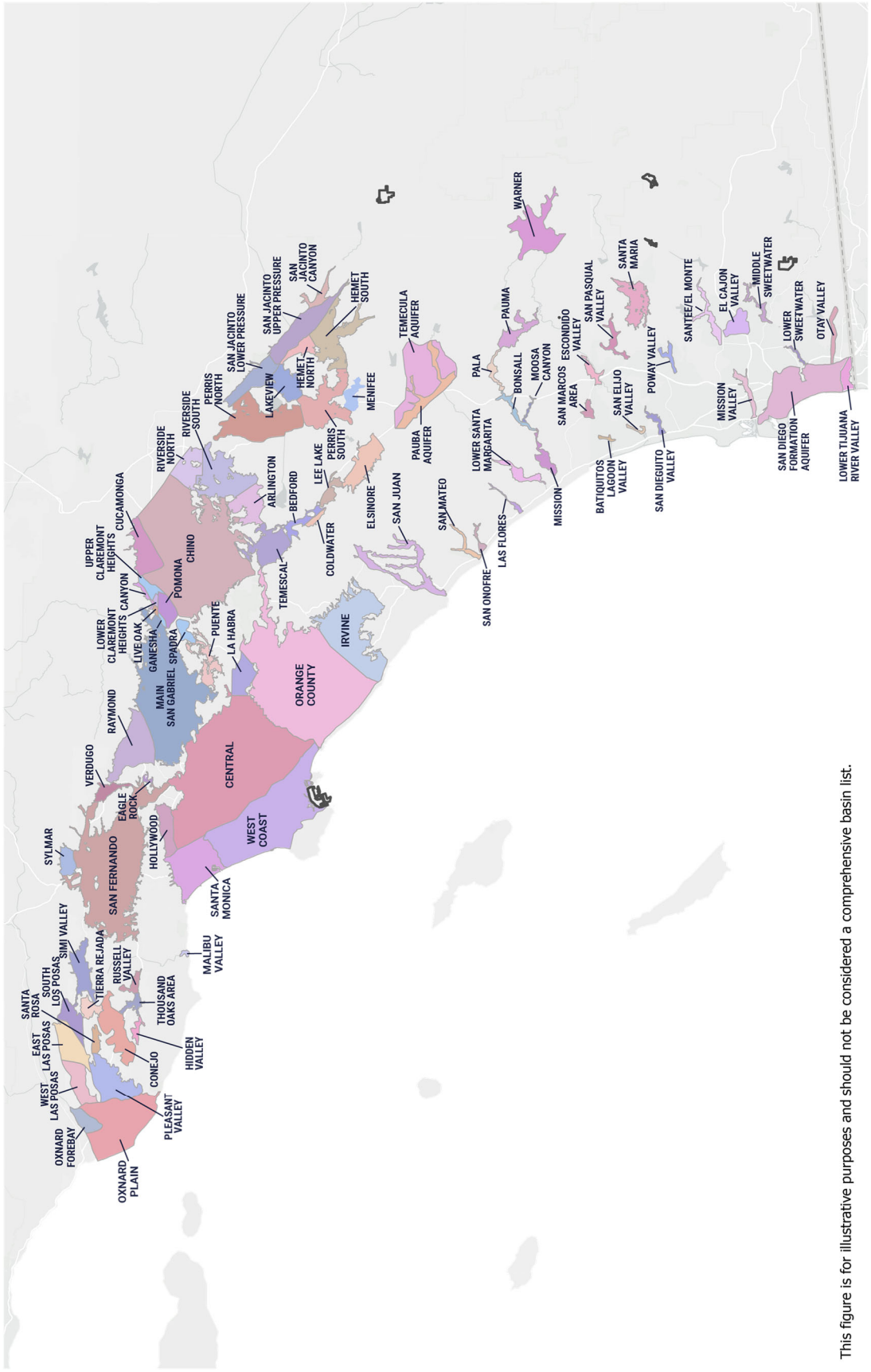
Major River Systems and Reservoirs

Local surface water resources consist of runoff captured in storage reservoirs and diversions from streams. Reservoirs hold the runoff for later direct use, and diversions from streams are delivered directly to local water systems. As Table A.2-3 shows, local water agencies currently own and operate more than 30 reservoirs. These reservoirs provide a

storage capacity of approximately 862 TAF. The historic average yield of these local surface supplies, which come from reservoir releases and stream diversions, is about 93 TAF per year from 2015 to 2024. The annual yield varies widely between wet and dry years, and most reservoirs that capture local surface runoff are operated with minimal carry-over storage. San Diego County has the greatest storage capacity for these types of reservoirs, with approximately 84 percent of the total local agency storage capacity in Metropolitan's service area.

In addition to the storage that is owned and operated by local agencies, Metropolitan operates Diamond Valley Lake (DVL), Lake Skinner, and Lake Mathews. DVL stores water imported during years of ample supply. DVL's 810 TAF capacity is used to augment supplies to meet dry year and seasonal needs, and also provides supply for the region during an emergency period. While Lake Skinner and Lake Mathews are largely used for system operations, they may also be used to augment supplies during dry years and emergencies, if necessary and available. Table A.2-4 lists the Metropolitan-owned reservoirs with significant storage capacity.

Figure A.2-2
Major Groundwater Basins in Metropolitan's Service Area



This figure is for illustrative purposes and should not be considered a comprehensive basin list.

Table A.2-3
Local Storage Reservoirs in Metropolitan's Service Area
(Acre-feet)

Member Agency/Sub-agency	Reservoir	Storage Capacity
Eastern MWD		
Rancho California WD	Vail Lake	45,207
Lake Hemet MWD	Lake Hemet	12,750
Fallbrook PUD	Red Mountain	1,335
Rainbow Municipal Water District	Morro Hill	465
Las Virgenes MWD	Westlake Reservoir	. 9,500
City of Los Angeles	Los Angeles	. 10,170
	Encino	. 9,800
	Stone Canyon	. 10,800
	Hollywood	. 4,200
MWD of Orange County		
Irvine Ranch WD & Serrano ID	Santiago	. 25,000
San Diego County Water Authority		
Carlsbad MWD	Maerkle	. 600
Escondido, City of	Dixon	. 2,606
	Wohlford	. 2,783
Helix WD	Cuyamaca	. 8,195
	Jennings	. 9,790
Poway, City of	Poway	. 3,432
Ramona MWD	Ramona	. 12,000
San Diego County Water Authority	Olivenhain – CWA	. 24,774
San Diego, City of	Barrett	. 34,806
	El Capitan	112,807
	Hodges	. 13,401
	Lower Otay	. 47,067
	Miramar	. 6,682
	Morena	. 50,694
	Murray	. 4,684
	San Vicente	249,358
	Sutherland	. 29,508
San Dieguito WD	San Dieguito	. 883
Sweetwater Authority	Loveland	. 25,400
	Sweetwater	. 28,079
Valley Center MWD	Turner	. 1,612
Vista Irrigation District	Henshaw	. 51,774
Western MWD of Riverside		
Temescal Water Company	Railroad Canyon	. 12,000
Total		**862,162**

Table A.2-4
Total Storage Capacity of Metropolitan's Reservoirs
(Thousands Acre-feet)

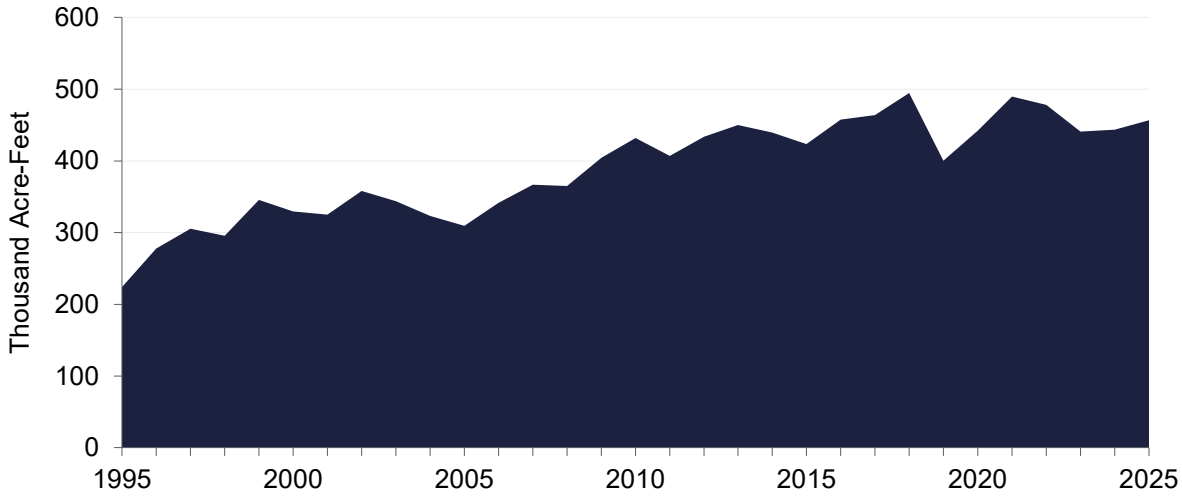
Reservoir	Capacity
Diamond Valley Lake	810
Lake Skinner	44
Lake Mathews	182

Lastly, Castaic Lake and Lake Perris are the terminal reservoirs to the West Branch and East Branch of the California Aqueduct operated by DWR. Through the Monterey Amendment to its SWP water service contract, Metropolitan has access to 219 TAF of flexible storage capacity in these SWP terminal reservoirs.

Water Recycling and Groundwater Recovery

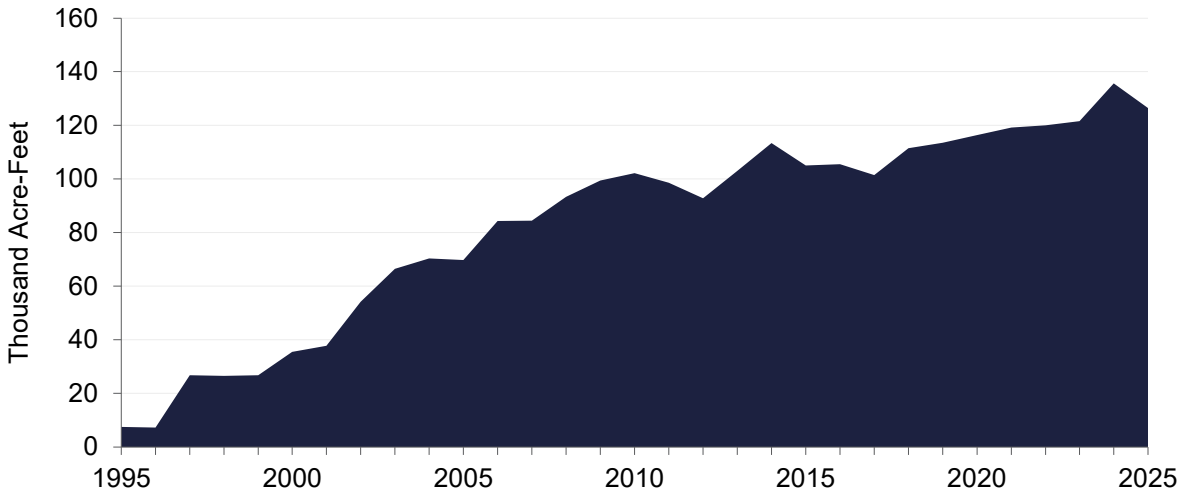
Water recycling projects involve treating wastewater to a level that is acceptable and safe for many non-potable applications. This resource is providing an increasing level of local water. In 1982, Metropolitan began helping to fund its member agencies' recycled water projects. Since that time, Metropolitan has invested approximately $558 million. In fiscal year (FY) 2024-25, water recycling projects in which Metropolitan has invested produced approximately 40 TAF. Local agency projects that did not receive financial assistance from Metropolitan produced an additional 417 TAF, of which approximately 74 TAF of Santa Ana River base flow were used to recharge the Orange County basin. This brings the regional total to 457 TAF of recycled water use. Figure A.2-3 demonstrates the increase in this regional supply for direct use.

Figure A.2-3: Recycled Water



In addition, local agencies have implemented several projects to recover contaminated or degraded groundwater for potable uses. The groundwater recovery projects use a variety of treatment technologies to remove nitrates, volatile organic compounds, perchlorate, color, and salt. In 1991, Metropolitan began helping fund its member agencies' groundwater recovery projects. Since that time, Metropolitan has invested approximately $213 million. In FY 2024-25, these groundwater recovery projects produced approximately 53 TAF. Other member agency projects that did not receive funding from Metropolitan produced another 74 TAF, for a regional total of 126 TAF. Figure A.2-4 shows this increase in supply.

Figure A.2-4: Groundwater Recovery



Imported Water

Most member agencies and retail water suppliers depend on imported water for a portion of their water supply. For some member agencies, Metropolitan supplies most of the water used within that agency's service area, while others obtain varying amounts of water from Metropolitan to supplement local supplies.

Figure A.2-5 shows the conveyance facilities for the state's imported water supplies. Descriptions of each of the imported sources of water available to Metropolitan's service area follow. Justification for projected water supplies from these sources is provided in Appendix 3.

Colorado River

A number of water agencies within California have rights to divert water from the Colorado River. Through the Seven Party Agreement (1931), seven agencies recommended apportionments of California's share of Colorado River water within the state. Table A.2-5 shows the historic apportionment of each agency and the priority accorded that apportionment.

Figure A.2-5: Major Water Conveyance Facilities in California

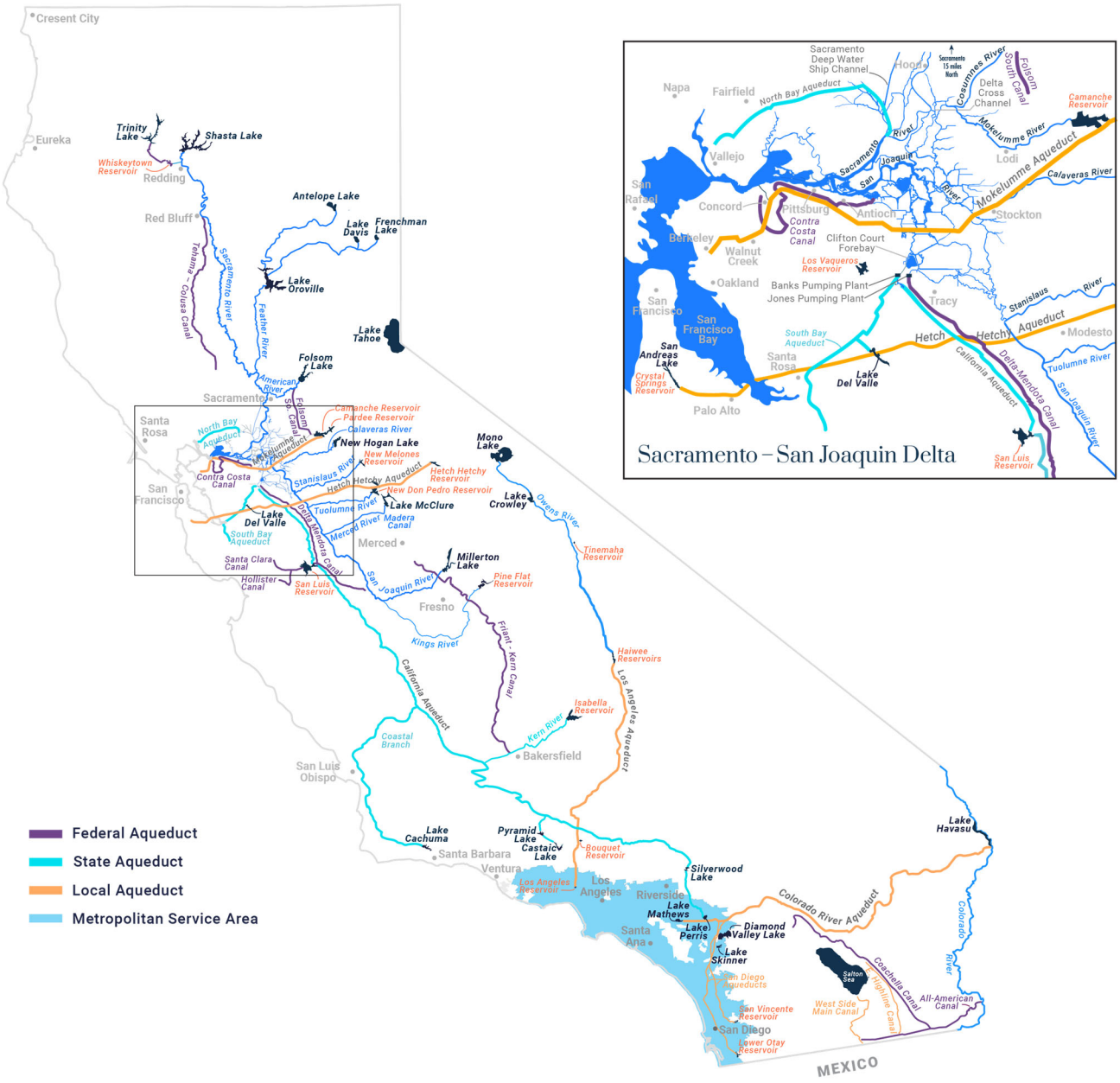


Table A.2-5
Priorities in Seven Party Agreement and Water Delivery Contracts

Priority	Description	TAF Annually
1	Palo Verde Irrigation District – gross area of 104,500 acres of land in the Palo Verde Valley	
2	Yuma Project (Reservation Division) – not exceeding a gross area of 25,000 acres in California	
3(a)	Imperial Irrigation District and land in Imperial and Coachella Valleys[1] to be served by All American Canal	3,850
3(b)	Palo Verde Irrigation District—16,000 acres of land on the Lower Palo Verde Mesa	
4	Metropolitan Water District of Southern California for use on the coastal plain of Southern California	550
Subtotal		4,400
5(a)	Metropolitan Water District of Southern California for use on the coastal plain of Southern California	550
5(b)	Metropolitan Water District of Southern California for use on the coastal plain of Southern California[2]	112
6(a)	Imperial Irrigation District and land in Imperial and Coachella Valleys[1] to be served by the All-American Canal	
6(b)	Palo Verde Irrigation District—16,000 acres of land on the Lower Palo Verde Mesa	300
7	Agricultural Use in the Colorado River Basin in California	
	Total Prioritized Apportionment	**5,362**

[1] The Coachella Valley Water District now serves Coachella Valley.

[2] In 1946, the City of San Diego, the San Diego County Water Authority, Metropolitan, and the Secretary of the Interior entered into a contract that merged and added the City of San Diego's rights to store and deliver Colorado River water to the rights of Metropolitan. The conditions of that agreement have long since been satisfied.

The water is delivered to Metropolitan's service area by way of the CRA, which has a rated capacity of approximately 1,700 cfs. The CRA conveys water 242 miles from its Lake Havasu intake to its terminal reservoir, Lake Mathews, near the City of Riverside.

Since the date of the original contract, several events have occurred that changed the supply that Metropolitan expects from the Colorado River. The most significant event was the 1964 U.S. Supreme Court decree in Arizona v. California that reduced Metropolitan's dependable supply of Colorado River water to 550,000 AF per year. The reduction in dependable supply occurred with the commencement of Colorado River water deliveries to the Central Arizona Project. In 1987, Metropolitan entered into a contract with the U.S. Bureau of Reclamation (USBR) for an additional 180,000 AF per year of surplus water when surplus water is available. In addition, Metropolitan has obtained a minimum of approximately 85,000 AF per year of Colorado River water since 1996 through a conservation program with the Imperial Irrigation District.

In 1979, the Present Perfected Rights (PPRs) of certain Indian reservations, cities, and individuals along the Colorado River were quantified. These PPRs predate the Seven Party Agreement, but the rights holders were not included in the Seven Party Agreement prioritizing California's use and storage of Colorado River water.

In 1999, under the auspices of the Colorado River Board of California, a draft plan, "California's Colorado River Water Use Plan," was developed. The Colorado River Board of California protects California's rights and interests in the resources provided by the Colorado River and represents California in discussions and negotiations regarding the Colorado River and its management. The overall purpose of California's Colorado River Water Use Plan was to provide Colorado River water users with a framework by which programs, projects, and other activities may be coordinated and cooperatively implemented. This framework specified how California would make the transition from relying on surplus water supplies from the Colorado River to living within its normal (basic) water supply apportionment.

To implement these plans, a number of agreements were executed. In October 2003, representatives from Metropolitan, IID, and Coachella Valley Water District (CVWD) executed the Quantification Settlement Agreement (QSA) and several other related agreements. Parties involved include the San Diego County Water Authority (SDCWA), the California Department of Water Resources (DWR), the California Department of Fish and Wildlife, the U.S. Department of the Interior, and the San Luis Rey Indian Water Rights Settlement Parties. The QSA quantifies the use of water under the third priority of the Seven Party Agreement and allows for implementation of agricultural conservation, land management, and other programs identified in Metropolitan's 1996 IRP. Quantification of the third priority provides the needed numeric baseline from which conservation and transfer programs may be measured. The QSA helped California reduce its reliance on the Colorado River down to its normal apportionment (4.4 MAF per year).

The quantification of the agricultural priorities under the QSA provided for the water saved under the Palo Verde Land Management and Crop Rotation Program to be made available to Metropolitan. This program provides up to 133,000 AF of water to be available to Metropolitan in certain years and supplies a minimum of 33,000 AF per year.

SDCWA participates in QSA-related projects that provide additional water supplies that the agency exchanges with Metropolitan for receipt of Metropolitan deliveries. First, the water conserved by these projects is made available to Metropolitan at Lake Havasu. In exchange, Metropolitan delivers an amount of Metropolitan water equal to the amount of Colorado River water conserved by IID for SDCWA. Second, federal law allocates a portion of the water available as a result of the Coachella Canal Lining Project and the All-American Canal Lining Project for the benefit of parties, including five Indian Bands, and two non-Indian municipal water purveyors (San Luis Rey Settlement Parties) involved in litigation over water rights to the San Luis Rey River in San Diego County. Metropolitan exchanges that water and provides an equal amount of water to the United States for use by the San Luis Rey Settlement Parties, and SDCWA conveys the water when capacity is available for use within the Settlement Parties' service areas. The remainder of the water available as a result of the canal lining projects, up to the cap specified in the Metropolitan-SDCWA exchange agreement, is exchanged with SDCWA. Under a 2025 agreement between SDCWA and MWD, SDCWA may make agreements with Metropolitan member agencies such that Metropolitan member agencies may receive a specified amount of exchange water instead of SDCWA. Under the 2025 Settlement Agreement, SDCWA may also offer to Metropolitan the right to purchase the conserved water that SDCWA has acquired. Any such agreement would not change the amount of water made available to the region.

In October 2004, Southern Nevada Water Authority (SNWA) and Metropolitan entered into a storage and interstate release agreement. Under this program, SNWA can request that Metropolitan store unused Nevada apportionment. The amount of water that Metropolitan diverted through 2015 under this agreement was over 422,000 AF. In subsequent years, SNWA may request the return of approximately 330,000 AF. It is expected that SNWA will not request the return of stored water until after 2026.

In December 2007, the Secretary of the Interior approved the adoption of interim guidelines for coordinated operations of Lake Powell and Lake Mead and reductions in Colorado River water deliveries during declared shortages. These guidelines provide water release criteria for Lake Powell and water storage and water release criteria for Lake Mead during shortage, normal, and surplus conditions in the Lower Basin; they provide a mechanism for the storage and delivery of conserved system and non-system water in Lake Mead; and they modify and extend interim surplus guidelines through 2026. The Record of Decision and accompanying agreement among the Colorado River Basin States protect reservoir levels by reducing deliveries during drought periods, encourage agencies to develop conservation programs, and allow the states to develop and store new water supplies.

In May 2006, Metropolitan and the USBR executed an agreement for a demonstration program that allowed Metropolitan to leave conserved water in Lake Mead that Metropolitan would otherwise have used in 2006 and 2007. The water left in Lake Mead had to have been made available through extraordinary conservation measures, which was accomplished in 2006 and 2007 through savings realized under the Palo Verde Land Management, Crop Rotation, and Water Supply Program. This demonstration program was an activity eligible for creation of Extraordinary Conservation Intentionally Created Surplus (ICS) under the provisions of the December 2007 federal guidelines for the operation of Lake Powell and Lake Mead. After the demonstration program, Metropolitan continued to

store water in Lake Mead through extraordinary conservation measures ("created ICS") as provided in the December 2007 federal guidelines in 2009, 2010, 2011, 2012, 2016, 2017, 2018, and 2019, 2020, and 2023, and withdrew ("delivered") ICS in 2008, 2013, 2014, and 2015, 2021, and 2022. In 2024, ICS was neither created nor delivered. As of January 1, 2025, Metropolitan had a total of 1.457 MAF of Extraordinary Conservation ICS water in Lake Mead.

The December 2007 federal guidelines provided Colorado River contractors the ability to create System Efficiency ICS through development and funding of system efficiency projects. To that end, in 2008 the Central Arizona Water Conservation District, SNWA, and Metropolitan contributed funds for the construction of the Drop 2 (Brock) Reservoir by the USBR. The purpose of the Drop 2 reservoir is to increase the capacity to regulate deliveries of Colorado River water at Imperial Dam, reducing the amount of water released downstream, and therefore lost from storage in Lake Mead, by approximately 70,000 AF annually. In return for funding one-sixth of the project cost, 100,000 AF of water stored in Lake Mead was assigned to Metropolitan as System Efficiency ICS in 2008. Metropolitan also created approximately 24,000 AF of System Efficiency ICS by contributing to a one-year pilot operation of the Yuma Desalting Plant. Overall, from 2008 to 2011, Metropolitan created over 124,000 AF of System Efficiency ICS. As of January 1, 2025, Metropolitan had approximately 89,000 AF of System Efficiency ICS water in Lake Mead.

In November 2012, as part of the implementation of Minute 319 to the 1944 water treaty between the U.S. and Mexico, Metropolitan executed an agreement with the USBR and other Lower Colorado River Basin stakeholders to fund a pilot water conservation program in the Mexicali Valley region of Mexico in exchange for a portion of the conserved water received as Binational ICS (BICS) stored in Lake Mead, converted from Intentionally Created Mexican Allocation (ICMA). The Minute 319 pilot program was completed in 2017, and Metropolitan received 23,750 AF of BICS, which remained stored in Lake Mead as of January 1, 2025. In September 2017, Metropolitan executed a similar agreement as part of the implementation of Minute 323, through which Metropolitan received 9,092 AF of BICS in 2020 and expects to receive an additional 18,183 AF of BICS in 2026.

In May 2019, in response to ongoing dry conditions in the Colorado River Basin and concern over water levels in Lake Mead, Metropolitan, the Secretary of the Interior, and representatives of state governments and water agencies throughout the Colorado River Basin executed the Agreement Concerning Colorado River Drought Contingency Management and Operations (DCP). Exhibit 1 of Attachment B to the DCP—Lower Basin Drought Contingency Operations (LBOps)—specifies certain changes to the management of Lake Mead. Key provisions include increases in the cumulative allowable ICS storage in Lake Mead for each state, greater flexibility in annual ICS storage limits, and the requirement for Lower Basin states to make contributions to Lake Mead storage ("DCP contributions") when water levels drop below elevation 1,075 feet. California DCP contributions would have been required when Lake Mead levels dropped below an elevation of 1,045 feet. However, California was never required to make a DCP Contribution.

In May 2022, Lake Powell had dropped to 3,523 feet (24 percent full), and USBR projections showed the possibility of the reservoir dropping below the minimum power pool (3,490 feet) within the following 24 months. In response, USBR and the Lower Basin States

(California, Arizona, and Nevada) initiated activities in 2023 to conserve at least 3 MAF by the end of 2026 under a 2024 Record of Decision to supplement the 2007 Interim Guidelines. The Lower Basin states exceeded the target of conserving half of the 3 MAF by the end of 2024, and as of December 2024, they have more than enough conservation activity under contract to meet the 3 MAF target by the end of 2026.

Metropolitan is undertaking ongoing efforts to maintain and improve the flexibility and quality of its water supply from the Colorado River. Chapter 3.1 of this Plan describes current programs and plans related to flexibility, and Chapter 4 describes water quality programs.

State Water Project

The State Water Project, which is owned by the state and operated by DWR, is the second source of Metropolitan's imported water supplies. The SWP is the largest state-built, multipurpose, user-financed water project in the country. It was designed and built primarily to deliver water, but also provides flood control, power generation, recreation, as well as fish and wildlife habitat enhancement. The SWP comprises 32 storage facilities (reservoirs and lakes), 662 miles of aqueduct, and 25 power and pumping plants.

The SWP conveys water from Northern California to the north and south of the San Francisco Bay Area and areas south of the Bay Delta region. Water from the SWP originates at Lake Oroville, which is located on the Feather River in Northern California. That water, along with all additional unused water from the watershed, flows into the Sacramento/San Joaquin Delta. Water from the Delta is then either pumped to water users in the San Francisco Bay area or transported through the California Aqueduct to water users in Central and Southern California.

In 1960, Metropolitan signed a water supply contract with DWR to receive water from the SWP. Metropolitan is one of the 29 agencies and districts that have long-term contracts for water service from DWR with a maximum contractual amount of 4,172 TAF per year. Metropolitan is the largest of the SWP contractors in terms of the people it serves (approximately 19 million), the share of the SWP water that it has contracted to receive (1,911 TAF per year, or approximately 46 percent), and the percentage of total annual payments made to DWR by agencies with SWP contracts (approximately 52 percent for calendar year 2025). Metropolitan receives deliveries of SWP supplies via the California Aqueduct at Castaic Lake in Los Angeles County, Devil Canyon Afterbay in San Bernardino County, and Box Springs Turnout and Lake Perris in Riverside County. The first delivery of SWP water to Metropolitan occurred in 1972.

The initial facilities of the SWP, completed in the early 1970s, were designed to meet the original needs of the SWP contractors. It was intended that additional SWP facilities would be built over time to meet projected increases in contractors' delivery needs. Each contractor's SWP contract provided for a buildup in contractual amount over time, with most contractors reaching their maximum annual contractual amount by the year 1990. Since the completion of the initial SWP facilities in the early 1970s, major improvements to the system have included: four new pumps added to the Banks Pumping Plant at the Delta, the completion of the Coastal Branch, and the East Branch enlargement. Metropolitan has developed groundwater storage programs with the Semitropic Water Storage District,

Arvin-Edison Water Storage District, Kern Delta Water District, and Antelope Valley-East Kern Water Agency to supplement the available water supply.

The amount of State Water Project water available for allocation each year is determined by DWR based on existing supplies in storage, forecasted hydrology, and other factors, including water quality and environmental flow obligations and other operational considerations. Deliveries to Metropolitan reached a high of 1,802 TAF in calendar year 2004, and a low of 468 TAF in 2022. The five percent SWP allocation for Metropolitan in 2014 and 2021 represents the lowest in the history of the SWP.

Over the last few decades, the listing of several fish species in the Sacramento/San Joaquin River Delta (Delta) under both state and federal Endangered Species Acts has constrained SWP operations and created more uncertainty in SWP supply reliability. These listed species include Delta smelt, winter-run Chinook salmon, spring-run Chinook salmon, Central Valley steelhead, green sturgeon, longfin smelt, and White Sturgeon (state-listed candidate only). In July 2024, DWR released the 2023 SWP Delivery Capability Report. Since the previous report released in 2021, the 2023 report shows that the current SWP delivery capability has been reduced by two significant changes in modeling assumptions. The first is the extension of the modeling period for an additional six years to September 2021, which includes most of the 2020-2022 drought period. The second major factor is the incorporation of changes in climate that have already occurred in the baseline projected hydrology. Additionally, the 2023 report utilized a new Risk-Informed Future Climate Scenario methodology and, consistent with previous reports, showed a reduction in future delivery capability as a result of climate change, which is altering the hydrologic conditions in the State. In May 2025, DWR published a technical addendum to the 2023 DCR with modeling results using reduced capacity in the California Aqueduct due to existing and future scenarios of subsidence. DWR recommended use of the draft 2025 SWP Delivery Capability Report to support long-term planning efforts because DWR has planned near- and long-term fixes and is committed to restoring the conveyance capacity of the California Aqueduct. Metropolitan supports efforts to curb subsidence, and will incorporate results of modeling in the future, if needed.

Metropolitan is undertaking ongoing efforts to maintain and improve the reliability and quality of its water supply from the State Water Project. Sections 3.2 and 3.3 in this Plan describe current programs and plans for reliability, and Chapter 4 addresses water quality issues.

Los Angeles Aqueduct

The City of Los Angeles imports water from the eastern Sierra Nevada through the Los Angeles Aqueduct (LAA). The original LAA, completed in 1913, imported water from the Owens Valley. In 1940, the aqueduct was extended to the Mono Basin. A second aqueduct, which parallels the original, was completed in 1970.

Prior to the 1990-1991 drought, the City of Los Angeles regularly delivered over 400 TAF of water from the combined Owens Valley/Mono Basin system. In the 1980s, the aqueduct delivered over 500 TAF of water in wet years.

In the late 1980s, a series of court injunctions limited the amount of water that Los Angeles could receive from its aqueduct system. In 1990, these limitations, along with a persistent

drought, limited the delivery from the aqueduct to only 106 TAF. The Mono Lake Water Rights Decision (Decision) in September of 1994 ended the litigation in the Mono Basin, while negotiations continued with Inyo County on the fate of the Owens Valley water supply. In the Decision, the state ruled that Mono Lake should rise 17 feet over the next 25 years. During this time, Los Angeles would only be permitted to divert a fraction of its historical amounts. After the lake had risen, the City of Los Angeles would still be allowed only significantly reduced diversions. However, the high precipitation during the 1990s allowed increased diversions of water to the LAA to occur at a much earlier time frame than had been foreseen at the time of the Decision.

More recently, the LAA diversions of water from the Owens Valley came under additional pressure. Diversion of water from the Owens River had led to the drying up of Owens Lake by the end of the 1920s. This dry lakebed became a major source of windblown dust, resulting in EPA pressure to develop a State Implementation Plan to bring the region into compliance with federal air quality standards. In 1998, the Los Angeles Department of Water and Power entered into a Memorandum of Agreement with the Great Basin Air Pollution Control District that specified actions needed to control the problem. These actions included shallow flooding and managed vegetation at various lakebed locations. An estimated 54 TAF per year will be required to maintain the dust control measures, further restricting the water available for diversion through the LAA. More recently, the city has been required to restore portions of the Owens River, which could further restrict the water that can be provided from this source. During the last ten years (2015-2024), LAA supplies ranged from a high of 380 TAF in 2017 to a low of 33 TAF in 2015.

Historical Total Regional Water Supplies

The previous sections have presented the various sources of Metropolitan's and the region's water supply. The amount of water supplied by each local and imported source from 1990 through 2025 appears in Table A.2-1. The imported supplies represent the amount of water imported into Metropolitan's service area, not the amount delivered to member agencies, which is shown in Table A.2-2. The difference between Metropolitan's imports and deliveries is water placed into or withdrawn from storage.

Appendix 3

JUSTIFICATIONS FOR SUPPLY PROJECTIONS

Appendix 3
JUSTIFICATIONS FOR SUPPLY PROJECTIONS

The California Water Code (CWC) Section 10631 requires that urban water suppliers identify and quantify, to the extent practicable, the existing and planned sources of water available to them over five-year increments to 20 years or as far as data is available. This CWC section further requires urban suppliers to include a detailed description of all water supply projects and water supply programs that may be undertaken to meet the total projected water use. This Appendix provides the basis for the water supply available to Metropolitan as contained in this plan, by each major source of supply. Such bases and proofs are required for supply verification under the legislation.

Throughout this Appendix, references are made to Metropolitan's operating budget and its long-term capital investment plan. The most recent operating budget (for fiscal years 2024-25 and 2025-26) was adopted at the April 9, 2024, meeting of Metropolitan's Board of Directors. A copy of the budget summary and the Capital Investment Plan for fiscal years 2024-25 and 2025-26 can be found at:

https://www.mwdh2o.com/budget-finance/

Another document of interest related to Metropolitan's water supply planning is its annual report to the state Legislature in compliance with Senate Bill 60 of 1999 (Hayden).[1] Senate Bill 60 requires that Metropolitan report on its progress in increasing its emphasis on cost-effective conservation, recycling, and groundwater recharge.

A.3.1. Colorado River Aqueduct Deliveries

A. Colorado River Supplies

Metropolitan obtains water from the Colorado River under its Boulder Canyon Project Section 5 water delivery contract with the Secretary of the Interior providing for permanent service. A number of programs have been developed over the years to enhance and manage Colorado River supplies available under its water delivery contract. Appendix 2 describes the history of water supplies and the expected availability from this source, and Chapter 3.1 of the 2025 UWMP describes the agreements for water supplies.

Rationale for Expected Supply

Historical Record

Water supply under Metropolitan's Boulder Canyon Project Section 5 water delivery contract has been delivered since 1939. By existing contract, it is expected to be available in perpetuity because of California's senior water rights to use of Colorado River water. The historical record for available Colorado River water indicates that Metropolitan's contracted Colorado River supply has been available in every year. Through 2002 the volume of water

[1] Metropolitan Water District of Southern California, *Annual Progress Report to the California State Legislature: Achievements in Conservation, Recycling and Groundwater Recharge (February 2025),* which can be found at *https://www.mwdh2o.com/*. The legislation requiring this information can be found at http://www.leginfo.ca.gov/pub/99-00/bill/sen/sb_0051-0100/sb_60_bill_19990916_chaptered.pdf. Similar reports have been filed with the Legislature since 2000.

available and diverted from the Colorado River was up to the annual capacity of the Colorado River Aqueduct of approximately 1.25 MAF. Since 2003, increased use by the other Colorado River basin states and persistent dry conditions in the Colorado River Basin have reduced the firm available supply to Metropolitan's 550 TAF Priority 4 entitlement. In the near term, the 2007 Interim Guidelines, the operational guidelines currently governing river operations, including the conditions under which shortages occur, expire in 2026. The development of operational guidelines that will replace the 2007 Interim Guidelines is ongoing, which introduces uncertainty about Metropolitan's future Colorado River water supplies. Although the shape of the post-2026 guidelines remains unclear, it is likely that California will need to reduce its use of Colorado River water, and as the junior priority in California, Metropolitan's supplies are at risk.

Written Contracts or Other Proof

Metropolitan's entitlement to Colorado River water is based on a series of interstate compacts, federal laws, agreements, court decrees, and guidelines collectively known as "The Law of the River,"[2] which governs the distribution and management of Colorado River water. The following documents specifically determine Metropolitan's dependable supplies:

1931 Seven Party Agreement.[3] The 1931 Agreement recommended California's Colorado River use priorities and has no termination date. The priorities to water available for use in California held by Palo Verde Irrigation District (PVID), Yuma Project (Reservation Division), Imperial Irrigation District (IID), Coachella Valley Water District (CVWD), and Metropolitan are shown in Table A.2-5. These priorities are incorporated into the water delivery contracts that the Secretary of the Interior executed with the California agencies in the 1930s for water from Lake Mead. Metropolitan holds Priority 4 to California's basic apportionment of Colorado River water, which amounts to an annual volume of 550,000 AF. Metropolitan also holds a Priority 5 right to 662 TAF per year. Appendix 2 describes the current status of water available under these priorities.

Metropolitan's Basic Contracts.[4] Metropolitan's 1930, 1931, and 1946 basic contracts with the Secretary of the Interior permit the delivery of 1.212 MAF per year when sufficient water is available. Metropolitan's 1987 surplus flow contract for up to 180 TAF with USBR permits the delivery of water to fill the remainder of the Colorado River Aqueduct when water is available.

Consolidated Court Decree.[5] The 1964 U.S. Supreme Court Decree confirmed the Arizona, California, and Nevada basic apportionments of 2.8 MAF per year, 4.4 MAF per year, and 300 TAF per year, respectively. The 1964 Decree also permits the Secretary of the Interior to make water available that is unused by one of the states for use in the other two states. In addition, it permits the Secretary of the Interior to make surplus water available. The Consolidated Decree issued on March 27, 2006, by the U.S. Supreme Court in Arizona v. California consolidated into one decree the initial 1964 decree, the 1979 supplemental

[2] A description of many of these documents can be found at http://www.usbr.gov/lc/region/pao/lawofrvr.html.
[3] This agreement among the seven California agencies was dated August 18, 1931, and was codified in federal regulations promulgated by the Secretary of the Interior on September 28, 1931.
[4] Including contract number IIr-645 dated April 9, 1930, supplemented September 28, 1931.
[5] The Consolidated Decree entered by the U.S. Supreme Court on March 27, 2006, in *Arizona v. California, et al.,* can be found at http://www.usbr.gov/lc/region/pao/pdfiles/scconsolidateddecree2006.pdf.

decree, the 1984 second supplemental decree, the 2000 third supplemental decree, and the 2006 approval of settlements reached on the water rights claim of the Fort Yuma Indian Reservation. The Consolidated Decree quantified present perfected rights (PPRs) to the use of Colorado River water by certain Indian reservations, federal wildlife refuges, and other users.

2003 Quantification Settlement Agreement (QSA). The QSA and several other related agreements were executed in October 2003.[6] The QSA quantifies the use of water under the third priority of the Seven Party Agreement and further allocates 38 TAF of the sixth priority to Metropolitan. The QSA provides the numeric baseline needed to measure conservation and transfer programs, and it allows for implementation of agricultural conservation, land fallowing, and other programs identified in Metropolitan's IRP. Although this agreement does not directly impact Metropolitan's entitlements, Metropolitan agreed to forbear consumptive use when necessary so that the Secretary of the Interior can satisfy the uses of holders of miscellaneous and Indian PPRs in excess of 14.5 TAF.

2005 Settlement Agreement with Quechan Indian Tribe. In 2005, Metropolitan entered into a settlement agreement in Arizona v. California with the Quechan Indian Tribe and other parties. The Tribe uses Colorado River water on the Fort Yuma Indian Reservation. Under the settlement agreement, the Tribe, in addition to the amounts of water decreed for the benefit of the Reservation in the 1964 decree in Arizona v. California, is entitled to (a) 20 TAF of diversions from the Colorado River, or (b) the amount necessary to supply the consumptive use required for irrigation of a specified number of acres, and for the satisfaction of related uses, whichever is less. Of the additional diversions, 13 TAF became available to the Tribe in 2006. An additional 7 TAF become available to the Tribe in 2035. Metropolitan agreed to provide annual incentive payments to the Tribe if the Tribe forbore diversion of the additional water, thereby allowing Metropolitan to divert it.

Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead. In December 2007, the Secretary of the Interior approved a Record of Decision establishing specific interim guidelines for reductions in Colorado River water deliveries in the Lower Basin during declared shortages and coordinated operations of Lake Powell and Lake Mead. These guidelines provide criteria for water releases from Lake Powell, water storage and water release criteria for Lake Mead during shortage, normal, and surplus conditions in the Lower Basin, and a mechanism for Metropolitan to store and take delivery of conserved system and non-system water in Lake Mead. In December 2020, the seven Colorado River Basin States sent a letter to the Secretary of Interior giving notice that the Basin States have begun the process of reconsultation regarding the 2007 Interim Guidelines. The Basin States and major water contractors, including Metropolitan, are involved in reconsultation and development of new guidelines for the management and operation of Lake Powell and Lake Mead after the term of the 2007 interim guidelines ends in 2026.

Lower Basin Drought Contingency Plan (DCP). In April 2019, the President signed legislation directing the Secretary of the Interior to sign and implement four agreements related to the Upper and Lower Basin DCPs without delay. The agreements were executed and became effective on May 20, 2019, and expire in 2026. The Lower Basin Drought

[6] These agreements can be found at http://www.iid.com/water/library/qsa-water-transfer.

Contingency Plan Agreement require California, Arizona, and Nevada to contribute defined volumes of water to Lake Mead ("DCP Contributions") when lake elevations drop below certain levels. However, California was never required to make any DCP Contributions since Lake Mead levels remained above the relevant threshold for California (1,045 feet). Although the DCP expires in 2026, the determination that California is not required to make DCP Contributions in 2026 has already been made as part of USBR's 2026 Annual Operating Plan, which was published prior to the publication of this UWMP.

Implementation of the Lower Basin DCP enhanced Metropolitan's ability to store water in Lake Mead and to ensure that water in storage can be delivered at a later date. The Lower Basin DCP increased the total volume of water that California may store in Lake Mead as ICS by 200,000 AF. Water stored as ICS will be available for delivery through 2036 as long as Lake Mead's elevation remains above 1,025 feet. Under the 2007 Interim Guidelines alone, that water would likely have become inaccessible below a Lake Mead elevation of 1,075 feet. DCP Contributions may be made through conversion of existing ICS or through the simultaneous creation of ICS and conversion to DCP ICS. This type of DCP Contribution becomes DCP ICS, which is recoverable if Lake Mead elevation exceeds 1,110 feet. DCP Contributions may also be made by leaving in Lake Mead water to which there was a legal right of delivery. This type of DCP Contribution becomes system water and may not be recovered. The Lower Basin DCP Agreement set rules for delivery of DCP ICS through 2026 and between 2027 and 2057.

Financing

Metropolitan's operating budget (referenced at the beginning of this appendix) includes the cost of delivering Colorado River water and the payment to the Quechan Indian Tribe, which is paid from water sales revenue.

Federal, State, and Local Permits/Approvals

Metropolitan's fourth priority Colorado River water is currently available, and this priority assures delivery of the basic apportionment.

B. IID - Metropolitan Conservation Program

Source of Supply

The IID-Metropolitan Conservation Program provides an annual supply that is delivered to Metropolitan's service area via its Colorado River Aqueduct (CRA). In 1988, Metropolitan executed a Conservation Agreement to fund water efficiency improvements within IID's service area in return for the right to divert the water conserved by those improvements. The program consists of structural and non-structural measures, including the concrete lining of existing canals, the construction of local reservoirs and spill-interceptor canals, installation of non-leak gates, and automation of the distribution system. Other implemented projects include the delivery of water to farmers on a 12-hour basis rather than a 24-hour basis and improvements in on-farm water management.

Expected Supply Capability

The IID-Metropolitan Conservation Program activity began in 1990, has been fully operational since 1998. While the initial volumes made available by the program varied, it

has made available 105,000 AF of conserved water annually from 2016 onward. The initial program agreement provided CVWD the option to call up to about 45,000 AF per year if needed to meet its demands. This water is available to Metropolitan if not required by CVWD. Execution of the QSA reduced CVWD's option to a maximum of 20,000 AF, thereby increasing the minimum supply to Metropolitan to 85,000 AF from 2016 onward through a second amendment to the agreement and a clarification of the number of 12-hour deliveries to be included in the program through a letter agreement. This amount was further increased to 90,000 AF from 2020 to 2026 under the 2019 Second Amendment to the Delivery and Exchange Agreement with CVWD, with the remainder of CVWD's option (15,000 AF) to be delivered by Metropolitan for CVWD at Whitewater.

Rationale for Expected Supply

Historical Record

The IID-Metropolitan Conservation Program has been fully operational since 1998. Existing agreements have extended the initial term to at least 2041 or 270 days after the termination of the QSA, whichever is later, and they guarantee Metropolitan a minimum of 85,000 AF per year from 2016 onward. A 2019 amendment increased the minimum to 90,000 AF from 2020 to 2026.

Since 1990, the program has conserved as much as 109,460 AF per year to date. By an amendment to the program agreement beginning in 2007 and a 2014 letter agreement, the annual conserved water yield for accounting purposes is 105,000 AF. The historical record indicates that Metropolitan's expected minimum supply of 85,000 AF per year (and 90,000 AF from 2020 to 2026) will be available over at least the next 16 years.

Written Contracts or Other Proof

Metropolitan's annual supply from the IID-Metropolitan Conservation Program is based on three agreements and amendments to those agreements.

1988 IID-Metropolitan Conservation and Use of Conserved Water Agreement. This Agreement was executed in December 1988 by IID and Metropolitan for a 35-year term following completion of program implementation (1998-2033).

1989 Approval Agreement. This Agreement secured the approval of PVID and CVWD to not divert an amount of water equal to the amount conserved except under limited circumstances. The Agreement was executed in December 1989.

1989 Supplemental Approval Agreement. This Agreement was executed in December 1989 between Metropolitan and CVWD to coordinate Colorado River diversions and the use of the conserved water provided by the Program.

2003 Amendments to 1988 Agreement and 1989 Approval Agreement. These amendments revise Metropolitan's potential obligation to reduce its use of the conserved water yield in favor of its use by CVWD down to 20,000 AF annually. Any of this water not used by CVWD would be available to Metropolitan. The amendments also extended the term of the IID-Metropolitan conservation program through December 31, 2041, or 270 days beyond the termination of the QSA.

2007 Amendments to 1988 Agreement and 1989 Approval Agreement. These amendments specify that beginning in 2007, the annual conserved water yield would be at least 105,000 AF with continued operation of 24 tailwater pump back systems, of which up to 20,000 AF would be made available to CVWD upon request.

2014 Letter Agreement Related to the 1988 Agreement. This letter agreement specifies that beginning in 2016, the annual conserved water yield would be fixed at 105,000 AF, of which up to 20 TAF would be made available to CVWD upon request. This amendment also removes tailwater recovery systems from the conservation actions and quantifies the yield and number of 12-hour deliveries that are included in the program.

2019 Second Amendment to Delivery and Exchange Agreement Between Metropolitan and Coachella for 35 TAF. The second amendment was executed in December 2019 between Metropolitan and CVWD for the exchange of additional water during the period from 2020 through 2026. Under this amendment, Metropolitan is guaranteed 90 TAF per year from 2020 to 2026, with the remaining amount that CVWD could call (15 TAF) to be made available to CVWD at Whitewater.

Financing

Construction of the water efficiency improvements under this Program have been funded and put into operation. Metropolitan's five-year financial forecast in the budget includes the cost of operating, maintaining, and delivering the conserved water under the IID-Metropolitan Conservation Program.

Federal, State, and Local Permits/Approvals

A comprehensive environmental review process supported implementation.

EIR for Program. The IID Board certified the final EIR for the Program in December 1986.[7]

Supplemental EIR for Program. The IID Board certified the final EIR for the Completion Program in June 1994.[8]

Program EIR for Quantification Settlement Agreement. Metropolitan's Board certified the final Program EIR for the QSA in June 2002.[9]

Addendums to the QSA Final Program EIR. Metropolitan's Board adopted the Addendum to the QSA Final Program EIR in December 2002 and a second addendum in September 2003. Metropolitan's Board also adopted the Findings of Fact and Statement of Overriding Considerations, and Mitigation and Monitoring and Reporting Program at that time.

[7] Imperial Irrigation District, *Final EIR, Proposed Water Conservation Program and Initial Water Transfer, Imperial Irrigation District,* October 1986. SCH Number: 1986012903.
[8] Imperial Irrigation District, *Final EIR for Modified East Lowline and Trifolium Interceptors, and Completion Projects*, May 1994. SCH Number: 1992071061.
[9] Coachella Valley Water District, Imperial Irrigation District, Metropolitan, San Diego County Water Authority, *Final Program EIR, Implementation of the Colorado River Quantification Settlement Agreement*, June 2002, SCH Number 2000061034.

C. Palo Verde Irrigation District Land Management, Crop Rotation and Water Supply Program

Source of Supply

At its May 11, 2004 meeting, Metropolitan's Board authorized a 35-year land management, crop rotation, and water supply program with the PVID. Under the program, participating landowners in PVID are being paid to reduce their water use by not irrigating a portion of their land. A maximum of 29 percent of lands within PVID can be fallowed in any given year. Under the terms of the QSA, water savings within the PVID service area are made available to Metropolitan. PVID has the first priority for Colorado River water under the water delivery contracts with the USBR. Implementation of the program began in January 2005. The agreement also specifies that the participating landowners will fallow land at least in an amount equal to 25 percent of the landowner's total maximum fallowing commitment during each year.

Expected Supply Capability

Metropolitan estimates that the PVID/Metropolitan Program would provide up to 133,000 AF per year of additional Colorado River water. This water would be available in any year as needed and in accordance with the provisions described in the agreements with Palo Verde Valley landowners and PVID.

Rationale for Expected Supply

Historical Record

Metropolitan and PVID tested the concept of developing a water supply for Metropolitan by entering into an agreement in 1992.[10] Agreements were signed with landowners and lessees in the Palo Verde Valley to forego irrigation for a two-year period from August 1992 to July 1994. Both PVID and Metropolitan signed approved Principles of Agreement in 2001. PVID issued the Final EIR for the Proposed Palo Verde Irrigation District Land Management, Crop Rotation and Water Supply Program in September 2002.[11]

Implementation of the program began in January 2005. In March 2009, Metropolitan and PVID entered into a one-year supplemental fallowing program within PVID that provided for the fallowing of additional acreage, with additional savings of 24,100 AF in 2009 and 32,300 AF in 2010. In August 2021 and August 2023, Metropolitan entered into two agreements. The August 2021 agreement was with the U.S. Bureau of Reclamation (USBR), the Central Arizona Water Conservation District, and the Southern Nevada Water Authority. The August 2023 agreement is with USBR and will end in 2026. Under the agreements, the parties would fund the program to generate system conservation water for Lake Mead rather than water for diversion by Metropolitan.

[10] Presented to Metropolitan's Board at its regular meeting on January 14, 1992.
[11] SCH Number 2001101149.

Calendar Year	Water Conserved for Metropolitan's Use (AF)
2005	108,700
2006	105,000
2007	72,300
2008	94,300
2009	120,200
2010	116,300
2011	122,200
2012	73,700
2013	32,800
2014	43,000
2015	94,500
2016	125,400
2017	119,400
2018	95,700
2019	44,500
2020	43,800
2021	42,300
2022	29,800
2023	15,749
2024	0
2025	0

Written Contracts or Other Proof

Contracts for this program are listed below.

August 2004 Forbearance and Fallowing Program Agreement. This agreement establishes the PVID/Metropolitan Program, which provides for a solicitation of and provisional approval of landowner participation offers, specifies the process for incorporating offers into agreements with landowners, and states the terms and conditions for fallowing, including payments made by Metropolitan.

Landowner Agreements for Fallowing in PVID. These agreements specify an escrow process to consummate the transaction, an easement deed to encumber land for fallowing, a tenant agreement to subordinate a tenant's lease to the agreement and easement, and an encumbrance agreement to subordinate any encumbrance (e.g., a mortgage) to the easement. These agreements also state the landowner's fallowing obligation, payments to be made by Metropolitan, and land management measures to be implemented.

Financing

Metropolitan's annual O&M budget (referenced above) includes the cost of the PVID/Metropolitan Program.

Federal, State and Local Permits

EIR for Program. A Notice of Preparation for the PVID/Metropolitan Program was published on October 29, 2001. PVID issued the Final EIR for the Proposed Palo Verde Irrigation District Land Management, Crop Rotation, and Water Supply Program in September 2002 (see reference above).

D. Land Management of Metropolitan Owned Lands in Palo Verde Valley

Source of Supply

Metropolitan owns 21,764 irrigable acres in the Palo Verde Valley, which are currently leased to five farm tenants. Water savings are generated through rent incentives for planting lower-water-using crops (annual grasses, grains, vegetables) instead of the higher-water-using crops (alfalfa) that are the norm in the Palo Verde Valley. Metropolitan estimates these savings using a combination of OpenET and applied water data from PVID.

Aside from water conserved through the lease incentives, Metropolitan's lands are also enrolled in the Land Management, Crop Rotation, and Water Supply Program and are fallowed at the same call percentage as the rest of the Palo Verde Valley. The water supply projections described here are only those generated on the farmed acreage. Under the terms of the QSA, all water savings within the PVID service area are made available to Metropolitan.

Expected Supply Capability

Changes in land management through cropping generate an additional 1,400 to 5,000 AF annually, compared to a baseline of non-Metropolitan lands. Because all Metropolitan-owned lands are enrolled in the Fallowing Program, the savings from agricultural practices vary depending on the fallowing call for each year, with a high call resulting in lower savings due to a lower amount of farmed acreage. Water savings also depend on the cropping choices made each year by the farm tenants, which are influenced by market prices and business factors.

Rationale for Expected Supply

Water savings are estimated by comparing the average evapotranspiration (ET) across all farmed acreage on Metropolitan lands versus non-Metropolitan lands in PVID for each fallowing Program Year. ET data is sourced from OpenET's eeMETRIC model and annual precipitation is subtracted. On average, Metropolitan-owned lands in PVID use 0.1 to 0.25 AF per acre less than non-Metropolitan lands, depending on the year. The ET in AF per acre is multiplied by the amount of farmed (un-fallowed) acreage for each Program Year to determine the total amount of water saved.

Financing

Metropolitan's annual O&M budget includes the cost of the PVID land management program.

Federal, State and Local Permits

This program is not subject to any permits or environmental impact reviews under federal, state, or local laws.

E. Metropolitan-CVWD Delivery and Exchange Agreement for 35,000 Acre-Feet

Source of Supply

Metropolitan delivers to CVWD up to 35,000 AF from Metropolitan's available State Water Project (SWP) Table A supply without condition on the actual Department of Water Resources (DWR) allocation for that year. As CVWD does not have a connection to the SWP, the water is delivered to CVWD by an exchange with Colorado River water. Metropolitan takes delivery of the Table A supply in conjunction with forgoing diversion of an equal volume of its Colorado River supply, effectively leaving this water in the Colorado River for diversion by CVWD at Imperial Dam. Exchange deliveries may also be made at the CRA Whitewater service connection or through the Metropolitan-CVWD-Desert Water Agency Advance Delivery Agreement. This program represents a net debit to Metropolitan's supplies.

Expected Capability

Up to 35,000 AF of Metropolitan's SWP Table A supply will be delivered annually to CVWD by exchange.

Rationale for the Expected Supply

This program is undertaken pursuant to the Delivery and Exchange Agreement between Metropolitan and Coachella for 35,000 AF dated October 10, 2003, and is a QSA-related agreement.

Program Facilities

Metropolitan takes delivery of the Table A supply from the East Branch of the California Aqueduct. For delivery to CVWD, at Metropolitan's request, the USBR releases a portion of Metropolitan's available Colorado River supply from Lake Mead for diversion by CVWD at Imperial Dam and conveyance through the All-American Canal System. Alternatively, Metropolitan can also divert the water through the CRA and make deliveries to CVWD through the CRA Whitewater service connection.

Historical Record

Since the 2003 execution of the QSA and the Delivery and Exchange Agreement, the following volumes of exchange water were delivered to CVWD at Imperial Dam and to Whitewater:

Calendar Year	Volume of Exchange at Imperial Dam (AF)	Volume of Exchange at Whitewater (AF)	Total (AF)
2003	0	0	0
2004	0	0	0
2005	0	0	0
2006	34,958	0	34,958
2007	0	0	0
2008	0	0	0
2009	0	0	0
2010	0	10,000	10,000
2011	0	105,000	105,000
2012	0	0	0
2013	0	2,508	2,508
2014	0	3,549	3,549
2015	0	865	865
2016	0	64,135	64,135
2017	0	35,000	35,000
2018	0	35,000	35,000
2019	0	35,000	35,000
2020	0	35,000	35,000
2021	0	6	6
2022	0	11	11
2023	0	104,983	104,983
2024	0	35,000	35,000
2025	0	235,000 (estimated)	235,000 (estimated)

Written Contracts or Other Proof

2003 Delivery and Exchange Agreement. This agreement between Metropolitan and CVWD provides for the delivery of up to 35,000 AF of Metropolitan SWP Table A supply by exchange with Colorado River water.

2015 First Amendment to Delivery and Exchange Agreement Between Metropolitan and Coachella. The first amendment was executed in December 2015. This amendment allows Metropolitan to make delivery through a deduction from the Metropolitan-CVWD-Desert Water Agency Advance Delivery Agreement.

2019 Second Amendment to Delivery and Exchange Agreement Between Metropolitan and Coachella. The second amendment was executed in December 2019 between Metropolitan

and CVWD. This amendment provides Metropolitan inter-annual flexibility for the delivery of the 35,000 AF. Instead of delivering up to 35,000 AF per year, Metropolitan would deliver an average of 35,000 from 2019 to 2026, for a total of 280,000 AF over 8 years (35,000 AF per year * 8 years = 280,000 AF)

2025 Third Amendment to Delivery and Exchange Agreement Between Metropolitan and Coachella. The third amendment was executed in June of 2025. This amendment provides for Metropolitan to deliver up to 200,000 AF of the water that otherwise would have been delivered between 2027 and 2035, in 2025 and 2026.

Federal, State, and Local Permits/Approvals

Program EIR for Quantification Settlement Agreement. Metropolitan's Board certified the final Program EIR for the QSA in June 2002.[12]

Addendums to the QSA Final Program EIR. Metropolitan's Board adopted the Addendum to the QSA Final Program EIR in December 2002 and a second addendum in September 2003. Metropolitan's Board also adopted the Findings of Fact and Statement of Overriding Considerations, and Mitigation and Monitoring and Reporting Program at that time.

September 2002 Final Program EIR for Coachella Valley Water Management Plan and State Water Project Entitlement Transfer. The final Program EIR for the Coachella Valley Water Management Plan and SWP Entitlement Transfer was certified by the CVWD on October 8, 2002.

F. SNWA and Metropolitan Storage and Interstate Release Agreement

Source of Supply

The source of supply is SNWA's unused Nevada apportionment of Colorado River water made available to Metropolitan for diversion and storage. In the future, Metropolitan will return water through reduced diversions of Colorado River water made at the request of SNWA.

Expected Capability

As of January 1, 2025, over 422,000 AF had been diverted by Metropolitan since 2004. Of the amount diverted, only 330,000 AF must be returned to SNWA.

Returns to SNWA are limited to no more than 30,000 AF annually unless Metropolitan agrees to a larger amount. In 2026, SNWA may request return of an amount equal to the shortage allocated by the Secretary of the Interior to Nevada, though they are not expected to do so. If the Secretary of the Interior apportions less than 280,000 AF of basic apportionment for use in Nevada, SNWA may request the return of up to 50,000 AF, 1 acre-foot for each acre-foot less than 280,000 AF.

If less than 75,000 AF has been returned, then during each year prior to 2027 for which Lake Mead begins the year at or below elevation 1,045 feet, Metropolitan will create 50,000 AF of Intentionally Created Surplus (ICS) in Lake Mead, until the combined sum of ICS and the amount of water returned to SNWA equals 75,000 AF. Prior to 2027,

[12] Coachella Valley Water District, Imperial Irrigation District, Metropolitan, San Diego County Water Authority, Final Program EIR, Implementation of the Colorado River Quantification Settlement Agreement, June 2002, SCH Number 2000061034.

Metropolitan would be able to request delivery of this ICS during a year in which Lake Mead begins the year at or above elevation 1,080 feet.

Rationale for the Expected Supply

Program Facilities

Water is diverted through the CRA by Metropolitan. To return the water to SNWA, Metropolitan would reduce its CRA diversions, and the Secretary of the Interior would make water available to SNWA at Lake Mead.

Historical Record

The annual volumes of water diverted into the CRA, and the volume of water stored for SNWA by Metropolitan are as follows:

Calendar Year	Volume of Water Diverted (AF)	Volume of Water Stored for SNWA (AF)
2004	10,000	10,000
2005	10,000	10,000
2006	5,000	5,000
2007	0	0
2008	45,000	45,000
2009	0	0
2010	0	0
2011	0	0
2012	62,839	41,892
2013	75,000	50,000
2014	65,000	43,333
2015	150,000	125,000
2016	0	0
2017	0	0
2018	0	0
2019	0	0
2020	0	0
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0

No water has been returned to SNWA.

Written Contracts or Other Proof

2004 Storage and Interstate Release Agreement. This agreement among Metropolitan, the Colorado River Commission of Nevada, SNWA, and the United States provides for the Secretary of the Interior to make any unused Nevada apportionment available to Metropolitan for diversion and storage. In subsequent years, the agreement provides for Metropolitan to make water available to SNWA by forgoing diversion of a portion of its available Colorado River supply.

Operational Agreement. As amended on August 11, 2009, on October 24, 2012, and on October 19, 2015, the Operational Agreement specifies the conditions under which Metropolitan would divert and store unused Nevada apportionment through 2026 and the return of water to SNWA.

G. Lower Colorado Water Supply Project

Source of Supply

Groundwater is pumped by the Lower Colorado Water Supply Project wells near the All-American Canal and is discharged to the Canal. IID reduces its net diversions of Colorado River water by an amount equal to the amount of Project water discharged into the Canal, permitting entities along the Colorado River that do not have rights or have insufficient rights to divert Colorado River water to obtain a supply of water. In 2007, Metropolitan entered into a contract with the USBR and the City of Needles to utilize the unused Project capacity.

Expected Capability

Metropolitan estimates that it received 9,000 AF of Lower Colorado Water Supply Project water in 2025.

Rationale for the Expected Supply

Program Facilities

Four Lower Colorado Water Supply Project wells pump water into the All-American Canal. Groundwater levels in the two initial project wells declined to the point that they could not operate at full capacity. The wells were subsequently deepened to restore their full pumping capacity. Two new Project wells became operational in 2018 and brought the pumping capacity to the full 10,000 AFY project capacity.

Historical Record

Metropolitan has received the following amounts of Lower Colorado Water Supply Project water:

Calendar Year	Volume of Water (AF)
2007	5,011
2008	6,300
2009	2,349
2010	3,872
2011	3,611
2012	3,253
2013	4,208
2014	6,109
2015	6,722
2016	6,647
2017	6,851
2018	9,469
2019	9,554
2020	9,481
2021	9,401
2022	9,521
2023	9,294
2024	9,496
2025	9,000 (estimated)

Written Contracts or Other Proof

2007 Lower Colorado Water Supply Project Contract among the United States, the City of Needles, and Metropolitan. This contract, as amended in 2010, 2020, and 2025, provides for the United States to deliver Colorado River water to Metropolitan, the availability of which results from the pumping of Lower Colorado Water Supply Project groundwater and the exchange of such water.

Financing

Metropolitan's O&M budget includes the cost associated with receipt of Lower Colorado Water Supply Project water.

H. Lake Mead Storage Program, Drop 2 (Brock) Reservoir Funding, Yuma Desalting Plant Pilot Project, Binational Intentionally Created Surplus, and the Lower Basin Drought Contingency Plan

Source of Supply

Water has been and will be stored in Lake Mead as Intentionally Created Surplus (ICS) through extraordinary conservation measures, such as water saved through the Palo Verde Irrigation District Land Management, Crop Rotation, and Water Supply Program.

Water has been and will be stored in Lake Mead as ICS through system efficiency measures, such as Metropolitan's funding contributions toward construction of the Drop 2 (Brock) Reservoir near the All-American Canal and pilot operation of the Yuma Desalting Plant.

Water has been and will be stored in Lake Mead as Binational ICS through implementation of pilot conservation projects in Mexico.

Water has been stored in Metropolitan's service area for IID as excess conservation.

Expected Capability

Metropolitan may create as much as 400,000 AF of Extraordinary Conservation ICS water in a single year less the amount that may be created by IID, which could be as much as 25,000 AF. In any given year, if Arizona and Nevada create less than their respective maximums, according to provisions in the Lower Basin Drought Contingency Plan (DCP) Metropolitan may create above 400,000 AF, provided that all entities in the Lower Basin create no more than 625,000 AF combined.

As stipulated in the DCP, upon creation, 10 percent of the Extraordinary Conservation ICS is deducted, resulting in additional system water stored in Lake Mead and leaving 90 percent of the water available for release to Metropolitan without additional annual evaporation losses.

Under the DCP, the amount of Extraordinary Conservation ICS accumulated in Lake Mead for Metropolitan is limited to 1.7 MAF less the amount accumulated by IID which could be as much as 50,000 AF and less the amount of Binational ICS stored by both IID and Metropolitan. Per the DCP, Arizona also requested 50,000 AF of California Extraordinary Conservation ICS accumulation space, further reducing the ICS accumulation capacity available to Metropolitan.

Metropolitan may take delivery of as much as 400,000 AF of Extraordinary Conservation ICS from Lake Mead in a year less the amount delivered to IID, which could be as much as 50,000 AF, as long as Lake Mead's elevation remains above 1,025 feet.

Under the DCP, Metropolitan agreed to store defined volumes of water in Lake Mead ("DCP Contributions") if the lake elevation drops below certain thresholds. California would begin making contributions in a given year if Lake Mead's elevation were projected to be at or below 1,045 feet (relative to mean sea level) on January 1. Since Lake Mead has remained above this elevation on each January 1 of the DCP term, Metropolitan has never been required to make DCP contributions. The DCP expires in 2026, but USBR has already determined in its Annual Operating Plan for Colorado River reservoirs that California is not required to make a DCP Contribution in 2026.

As of January 1, 2025, Metropolitan has 89,000 AF of System Efficiency ICS stored in Lake Mead. There are no evaporation losses charged to stored System Efficiency ICS. Annually, Metropolitan may take delivery of as much as 24,000 AF of this System Efficiency ICS resulting from pilot operation of the Yuma Desalting Plant and 25,000 AF of this System Efficiency ICS resulting from construction of the Drop 2 (Brock) Reservoir. The USBR may reduce this delivery if it determines a reduction is necessary to avoid a shortage.

Binational ICS is provided for through domestic agreements related to Minutes to the 1944 Treaty between the United States and Mexico. Metropolitan received 23,750 AF of Binational ICS in Lake Mead in 2017 under Minute 319. Under Minute 323 Metropolitan received 9,092 AF of Binational ICS in 2020 and will receive an additional 18,183 AF of Binational ICS in 2026, for a total of 27,275 AF of Binational ICS under Minute 323.

Additionally, under the California ICS Agreement, rather than storing conserved water in Lake Mead, IID may, with the written consent of Metropolitan, have up to 25,000 AF of this water delivered to Metropolitan for storage in any one calendar year. Upon request by IID, Metropolitan would return 90 percent of the stored water to IID with the remaining 10 percent left for Metropolitan's use. A 2015 Amendment allowed IID to increase the amount of water it could deliver to Metropolitan for storage from 2015 to 2017. Metropolitan would return 95 percent of the stored water to IID, with additional 3 percent reductions in return obligation each year starting in 2020. Also, Metropolitan may make temporary use of IID's Extraordinary Conservation ICS accumulated in Lake Mead. A 2021 Agreement allowed IID to store conserved water in Metropolitan's ICS account in an IID sub-account. Under the agreement, IID could create up to 25,000 AF per year in the IID sub-account, for a maximum sub-account volume of 50,000 AF. The agreement also clarified that Metropolitan would provide IID with 87,594 AF of storage credit for water conserved in 2018. This water was subject to a one-time 10 percent assessment and annual evaporation charges of 5,000 AF. As of January 1, 2025, of the volume that Metropolitan has stored for IID, approximately 250,000 AF is to be returned.

Rationale for the Expected Supply

Program Facilities

This program makes use of Lake Mead and the CRA.

Historical Record

From 2006 to 2010, Metropolitan created approximately 201,500 AF of Extraordinary Conservation ICS.

In 2008, the USBR assigned to Metropolitan 100,000 AF of water stored in Lake Mead as System Efficiency ICS due to Metropolitan's contributions to the Drop 2 Reservoir project, and Metropolitan diverted 34,000 AF of that water.

In 2010 and 2011, USBR assigned to Metropolitan 16,750 AF and 7,647 AF of water stored in Lake Mead as System Efficiency ICS, respectively, due to Metropolitan's contributions to the Yuma Desalting Plant pilot project.

From 2011 to 2012, Metropolitan created approximately 348,700 AF of Extraordinary Conservation ICS.

From 2013 through 2015, Metropolitan took delivery of approximately 475,600 AF of Extraordinary Conservation ICS.

From 2016 to 2019, Metropolitan created approximately 896,700 AF of Extraordinary Conservation ICS.

In 2017, Metropolitan received 23,750 TAF of Binational ICS.

From 2020 to 2024, Metropolitan created approximately 788,000 AF of Extraordinary Conservation ICS and took delivery of approximately 130,000 AF of Extraordinary Conservation ICS.

In 2020, Metropolitan received 9,092 AF of Binational ICS.

As of January 1, 2025, Metropolitan's Extraordinary Conservation ICS, System Efficiency ICS, and Binational ICS volumes in Lake Mead were approximately 1.46 MAF, 89,400 AF, and 32,800 AF respectively, and no DCP Contributions to Lake Mead have been required.

Written Contracts or Other Proof

2007 Lower Colorado River Basin Intentionally Created Surplus Forbearance Agreement among the Arizona Department of Water Resources, PVID, IID, the City of Needles, CVWD, Metropolitan, SNWA, and the Colorado River Commission of Nevada. This agreement sets forth the rules under which ICS water is developed, stored in, and delivered from Lake Mead. It also provides for IID storing conserved water with Metropolitan under certain conditions.

2007 California Agreement for the Creation and Delivery of Extraordinary Conservation Intentionally Created Surplus among Metropolitan, PVID, IID, CVWD, and the City of Needles. This agreement determines the conditions under which California contractors receiving Colorado River water may store and deliver water from Lake Mead.

2007 Agreement among the United States, the Colorado River Commission of Nevada, and the SNWA for the Funding and Construction of the Lower Colorado River Drop 2 Storage Reservoir Project. This agreement provides for: the United States to design and construct the Drop 2 Storage Reservoir Project; SNWA to fund the capital cost of the Project; the United States to credit SNWA's ICS account with 600,000 AF of System Efficiency ICS; and allows Metropolitan to become a party to the agreement, requiring that Metropolitan provide funding for a portion of the capital cost.

2007 Delivery Agreement between the United States and Metropolitan. This agreement provides the procedures for creating ICS water and guarantees delivery of the water to Metropolitan.

2008 Metropolitan Notice of Election to Participate as a Party to the Drop 2 Funding Agreement. This notice requires Metropolitan to provide funding for a portion of the capital cost of the Drop 2 Storage Reservoir Project, and the United States to credit Metropolitan's ICS account with 100,000 AF of System Efficiency ICS, reducing the amount of System Efficiency ICS in SNWA's account by an equal amount.

2009 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, and the Central Arizona Water Conservation District for a Pilot Project

for Operation of the Yuma Desalting Plant. This agreement provides for the allocation of the costs for the preparation and pilot operation of the Yuma Desalting Plant.

2010 Yuma Desalting Plant Pilot Project Delivery Agreement between the United States and Metropolitan. This agreement secures delivery of the ICS water created and specifies the manner in which this water will be accounted.

2012 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, and the Central Arizona Water Conservation District for a Pilot Program for the Conversion of Intentionally Created Mexican Allocation to Intentionally Created Surplus. This agreement provides for the allocation of the costs among the agencies for the implementation of pilot conservation projects within Mexico and the allocation of 95,000 AF of conserved water among the non-federal agencies as Binational ICS in Lake Mead.

2012 Interim Operating Agreement for Implementation of Minute No. 319 of the International Boundary and Water Commission. This agreement among the United States, the Upper Basin states, and Lower Basin states' agencies, including Metropolitan, sets forth the rules under which Intentionally Created Mexican Allocation is to be converted to Binational ICS for storage in and delivery from Lake Mead.

2012 Lower Colorado River Basin Forbearance Agreement for Binational Intentionally Created Surplus. This agreement among the state of Arizona, the Colorado River Commission of Nevada and SNWA, and California Colorado River water contractors, including Metropolitan, ensures that the Binational ICS made available to a contractor that invests in a project in Mexico cannot be claimed by another contractor in another state.

2012 Binational ICS Delivery Agreement. This agreement between Metropolitan and the United States secures delivery of the Binational ICS water made available by exchange and specifies the manner in which this water would be accounted.

2013 Agreement between Metropolitan and IID Regarding Binational Intentionally Created Surplus. This agreement allows IID to provide a payment to Metropolitan of up to 50 percent of the financial contribution to be made to the United States by Metropolitan for the implementation of pilot conservation projects within Mexico. As a result of IID's payment, Metropolitan received 23,750 AF and IID received 23,750 AF of Binational ICS in 2017.

2015 Amendment 2 to the California Agreement for the Creation and Delivery of Extraordinary Conservation Intentionally Created Surplus. This agreement between Metropolitan, PVID, IID, CVWD, and the City of Needles increased both IID's put capacity and cumulative capacity limits on storing conserved water with Metropolitan during the three-year period from 2015-2017.

2017 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, IID, and the Central Arizona Water Conservation District for a Pilot Program for the Conversion of Mexico's Water Reserve to Binational ICS. This agreement provides for the allocation of the costs among the agencies for the implementation of pilot conservation projects in Mexico and the allocation of 109,100 AF of conserved water to the non-federal agencies as Binational ICS in Lake Mead.

2017 Interim Operating Agreement for Implementation of Minute No. 323. This agreement between the United States, the Upper Basin states, and Lower Basin states' agencies, including Metropolitan, sets forth the rules under which Intentionally Created Mexican

Allocation is to be converted to Binational ICS for storage in and delivery from Lake Mead.

2017 Binational ICS Agreement. This agreement between the state of Arizona, the Colorado River Commission of Nevada and SNWA, and California Colorado River water contractors, including Metropolitan, ensures that the Binational ICS made available to a contractor that invests in a project in Mexico cannot be claimed by another contractor in another state.

2017 Binational ICS Delivery Agreement. This agreement between Metropolitan and the United States secures delivery of the Binational ICS water made available by exchange and specifies the way this water would be accounted for.

2019 Lower Basin Drought Contingency Plan. This agreement creates additional guidelines under which ICS water is developed, stored in, and delivered from Lake Mead.

2021 Settlement Agreement. This agreement between Metropolitan and IID provides for the creation of an IID sub-account within Metropolitan's ICS account and also provided for Metropolitan to give IID storage credits for conserved water in 2018.

I. Metropolitan/Quechan Pilot Seasonal Fallowing Program

Source of Supply

At its November 2021 meeting, Metropolitan's Board authorized a 2-year pilot seasonal fallowing program with the Quechan Tribe (Tribe) of the Fort Yuma Indian Reservation. Metropolitan's Board authorized extending the program to the end of 2026 at its November 2023 meeting. Under the program, participating farmers on land they lease from the Tribe (Tribe-leased land) are paid to reduce their water use by not irrigating a portion of this land. A maximum of 1,600 acres can be fallowed in any given year.

Implementation of the program began in March 2022.

Expected Supply Capability

It is estimated that the Pilot Seasonal Fallowing Program would provide up to 3,500 AF per year of additional Colorado River water. This water would be available in any year as needed and in accordance with the provisions described in the agreements with farmers and the Tribe.

Rationale for Expected Supply

Historical Record

Metropolitan and the Tribe entered into the Pilot Seasonal Fallowing Program to test the concept of developing a water supply for Metropolitan. Agreements were signed with farmers, with written consent from the Tribe, to forego irrigation for five summers between April and July in 2022 to 2026. Between 2022 and 2024, participating farmers conserved about 767 AF, which has been stored in Lake Mead for Metropolitan. Implementation of the program began in March 2022.

Written Contracts or Other Proof

December 2021 Agreement for the Implementation of a Pilot Seasonal Land Fallowing Program. This agreement establishes the Metropolitan/Quechan Pilot Seasonal Fallowing

Program, which provides for a solicitation of farmer interest in participation in the program, specifies the process for incorporating eligible lands into agreements with farmers, and states the terms and conditions for fallowing, including payments made by Metropolitan.

Agreement for Seasonal Fallowing in the Fort Yuma Indian Reservation in California (Farmer Fallowing Agreements). These agreements specify the process for farmers leasing land in California from the Tribe to participate in the Program. These agreements establish the fallowing period, the eligibility criteria for the fallowed land, the farmers' fallowing obligations, payments to be made by Metropolitan, and the land management measures to be implemented.

December 2023 First Amendment to the Agreement for the Implementation of a Pilot Seasonal Land Fallowing Program. This amendment extends the December 2021 two-year pilot agreement to 2026, making the program a five-year pilot. The parties did not make changes to the Metropolitan Board-approved terms of the original December 2021 agreement.

Financing

Metropolitan's annual O&M budget (referenced above) includes the cost of the Metropolitan/Quechan Pilot Seasonal Fallowing Program. Metropolitan provides an annual incentive per acre of irrigable land fallowed. The agreement provides for escalating the incentive every year using the Consumer Price Index. Metropolitan will pay 75 percent of the incentive to the participating farmer and 25 percent to the Tribe.

J. Quechan Diversion Forbearance Program

Source of Supply

The Quechan Tribe (Tribe) on the Fort Yuma Indian Reservation holds a higher priority water right than Metropolitan. In 2005, Metropolitan entered into a settlement agreement with the Tribe, under which the Tribe is entitled to divert 20,000 AF per year or the amount necessary to supply irrigation and related uses on 2,998.5 acres (whichever is less), in addition to the water the Tribe is entitled to under the 1964 Arizona v. California decree. Of this additional entitlement, 13,000 AF or the amount necessary for irrigation and related uses on 1,949.03 acres became available to the Tribe in 2006 (the remainder will become available to the Tribe in 2035). Metropolitan and the Tribe agreed that if the Tribe chooses to limit proposed development requiring the diversion of any of the additional water, then Metropolitan will provide an incentive payment to the Tribe on the condition that such water is received by Metropolitan.

Expected Supply Capability

The water supply benefit to Metropolitan is less than the cited 13,000 AF and 7,000 AF volumes since the amounts are diversions and not consumptive use. Roughly half of the Tribe's additional diversions would be expected to pass to Metropolitan as agricultural return flows, even without the agreement. Therefore, under ordinary circumstances, the water supply to Metropolitan from this program is approximately 6,500 AF and would increase to approximately 10,000 AF in 2035.

Importantly, for the years 2023 through 2026, USBR is funding the program to generate 13,000 AF of system water to be stored in Lake Mead as part of the Lower Basin water conservation commitment associated with the 2024 Final Supplemental Environmental Impact Statement for Near-term Colorado River Operations. Therefore, during these years, this water will not be available to Metropolitan.

Rationale for Expected Supply

Historical Record

During the period of 2006 through 2022, the program yielded water supplies of 6,550 AF per year, on average. Once USBR's funding of the program ceases in 2026, Metropolitan expects this water supply benefit to continue through 2035, at which time Metropolitan is allowed (by contract) to reassess participation in the program.

Written Contracts or Other Proof

2005 Settlement Agreement in Arizona v. California by and among the Quechan Indian Tribe of the Fort Yuma Indian Reservation, the United States of America, the Metropolitan Water District of Southern California, Coachella Valley Water District, and the State of California. This agreement specifies the terms of the Tribe's forbearance agreement with Metropolitan.

2023 System Conservation Implementation Agreement (SCIA) among the United States Bureau of Reclamation, the Quechan Indian Tribe of the Fort Yuma Indian Reservation, and the Metropolitan Water District of Southern California, to Implement the Lower Colorado Conservation and Efficiency Program (LC Conservation Program). This agreement implements the arrangement whereby USBR funds the Quechan diversion forbearance program for three years (2023-2025) to yield 13,000 AF of system conservation water as part of the Lower Colorado Conservation Program, associated with the 2024 Final Supplemental Environmental Impact Statement for Near-term Colorado River Operations. A November 12, 2024, amendment to the agreement extends the arrangement through 2026.

Financing

Metropolitan's annual O&M budget (referenced above) includes the cost of the Quechan Diversion Forbearance Program. When the program is not funded by USBR, Metropolitan makes an annual incentive payment of $125 per year for every acre-foot of the 13,000 AF forborne diversion, escalated by 2.5 percent per year from the first year of payment (2006). If the USBR-Quechan-Metropolitan SCIA were not in place, Metropolitan's payment to the Tribe in 2025 would have been $2.53 million.

K. Exchange with SDCWA

Source of Supply

As part of the QSA, SDCWA acquired the right to escalating volumes of conserved Colorado River water, which reached a peak annual volume of 277,700 AF in 2023. SDCWA makes this water available at Lake Havasu for Metropolitan diversion, where Metropolitan takes possession of the water and, in exchange, provides an equal amount of Metropolitan water deliveries to SDCWA. The conserved water is acquired by SDCWA

through its transfer agreement with the Imperial Irrigation District (IID) and from its rights to conserved water from the lining of the All-American and Coachella canals.

Under the transfer agreement with IID, the stabilized annual transfer volume of 200,000 AF is generated from on-farm efficiency conservation arrangements made by IID with its customers and other system efficiency measures.

The Coachella Canal Lining Project consists of a 35-mile concrete-lined canal, including siphons, which replaced an earthen canal. The project was completed in December 2006 and conserves 30,850 AF annually. The All-American Canal Lining Project consists of a concrete-lined canal constructed parallel to 23 miles of earthen canal. It was completed in 2009, conserving 67,700 AF annually.

Pursuant to the QSA and related agreements, the 98,550 AF of water resulting from these two canal lining projects annually is allocated as follows: 16,000 AF to the San Luis Rey Settlement Parties in San Diego County, 77,700 AF to SDCWA, and 4,850 AF for Coachella Canal Lining Project mitigation, with the amount not needed for mitigation becoming available to SDCWA.

Expected Supply Capability

According to the schedule established in the QSA, in 2021, the IID transfer to SDCWA reached 205,000 AF, reduced to 202,500 AF in 2022, and then stabilized at 200,000 AF per year in 2023 – the amount that will be made available to Metropolitan for exchange each year through 2047. At least 77,700 AF of canal lining water will be made available to Metropolitan for exchange each year through 2112. After 2022, the annual volume SDCWA makes available to Metropolitan is limited to 277,700 AF.

While a recent Settlement Agreement allows SDCWA to transfer its exchange deliveries to another Metropolitan Member Agency, no such agreements with other Metropolitan Member Agencies have been made. Under the Settlement Agreement, SDCWA may also offer its conserved water for sale to Metropolitan. In that case, Metropolitan would not have an exchange water delivery obligation to SDCWA or any other member agency. Under either arrangement, the amount of water available in Metropolitan's service area does not change.

Rationale for Expected Supply

Historical Record

The IID transfers to SDCWA began in 2003 at a volume of 10,000 AF and have ramped up each year thereafter according to a defined schedule, stabilizing at 200,000 AF in 2023.

Conserved water from the All-American Canal Lining Project first became available in 2008 when 7,385 AF was allocated to SDCWA. The amount increased to 54,429 AF in 2009, reached 56,200 AF in 2010, and has continued at that volume through 2025.

Conserved water from the Coachella Canal Lining Project first became available in 2006, when 687 AF was allocated to SDCWA, and ranged from 21,500 AF to 25,759 AF between 2007 and 2025. This volume varies due to the use of up to 4,850 AF of the conserved water in an environmental mitigation project.

SDCWA made available to Metropolitan all of this conserved water at Lake Havasu, where Metropolitan took possession and managed the water at its complete discretion for the benefit of all member agencies. Of the volume received at Lake Havasu, Metropolitan delivered an equal volume to SDCWA by exchange at a price less than its full service rate from a blend of available sources.

Written Contracts or Other Proof

Amended and Restated Agreement between The Metropolitan Water District of Southern California and the San Diego County Water Authority for the Exchange of Water. This October 10, 2003, agreement provides for Metropolitan delivery of Exchange Water to SDCWA in exchange for conserved Colorado River water SDCWA makes available to Metropolitan at Lake Havasu.

Agreement Between Imperial Irrigation District and San Diego County Water Authority for Transfer of Conserved Water. This April 9, 1998, agreement, as amended, allows IID to conserve water for transfer to SDCWA and establishes the price SDCWA pays to IID for the conserved water.

Allocation Agreement. This October 10, 2003, agreement among the United States, CVWD, IID, SDCWA, Metropolitan, and the San Luis Rey Settlement Parties provides for the allocation of water conserved from the All-American Canal Lining Project and the Coachella Canal Lining Project, and Metropolitan's assignment to SDCWA of it rights to both canal lining projects.

Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement. By this October 10, 2003, agreement, among the Secretary of the Interior, CVWD, IID, SDCWA, and Metropolitan, the Secretary agreed to deliver IID-SDCWA transfer water and canal lining water allocated to SDCWA to Metropolitan's Colorado River Aqueduct Intake at Lake Havasu for diversion by Metropolitan.

Financing

Metropolitan's annual O&M budget (referenced above) incorporates the price that SDCWA pays for Metropolitan delivery of Exchange Water, which is less than Metropolitan's full service rate.

L. Exchange with the United States

Source of Supply

The Coachella Canal Lining Project consists of a 35-mile concrete-lined canal, including siphons, which replaced an earthen canal. The project was completed in December 2006 and conserves 30,850 AF annually. The All-American Canal Lining Project consists of a concrete-lined canal constructed parallel to 23 miles of earthen canal. It was completed in 2009 and conserves 67,700 AF annually.

Pursuant to the QSA and related agreements, the 98,550 AF of water resulting from these projects annually is allocated as follows: 16,000 AF to the San Luis Rey Settlement Parties in San Diego County, 77,700 AF to SDCWA, and 4,850 AF for Coachella Canal Lining Project mitigation, with the amount not needed for mitigation becoming available to SDCWA.

The United States furnishes the 16,000 AF allocated to the San Luis Rey Settlement Parties at Metropolitan's Colorado River Intake on Lake Havasu. Metropolitan takes possession of the water and by exchange delivers an equal volume of Metropolitan's blended supplies to SDCWA. By separate agreement SDCWA conveys the water to the San Luis Rey Settlement Parties.

Expected Supply Capability

So long as water conserved by the All-American Canal Lining Project and Coachella Canal Lining Project is allocated to and available for use by the San Luis Rey Settlement Parties, the United States will make 16,000 AF available for diversion by Metropolitan in perpetuity.

Rationale for Expected Supply

Historical Record

The allocation of canal lining water to the San Luis Rey Settlement Parties was 172 AF in 2006, 4,500 AF in 2007, 6,013 AF in 2008, 15,648 AF in 2009, and 16,000 AF each year thereafter. The United States has made this water available for diversion by Metropolitan. Through May 31, 2017, all water furnished by the United States at Lake Havasu was available for use by Metropolitan for the benefit of all member agencies. In exchange, Metropolitan set aside a payment for the San Luis Rey Settlement Parties until the settlement was finalized. Beginning June 1, 2017, once the settlement was finalized, Metropolitan took possession of the water furnished by the United States and managed that water at its complete discretion for the benefit of all member agencies and delivered an equal volume to SDCWA by exchange from a blend of sources that were available to Metropolitan at a discounted price paid by the United States.

Written Contracts or Other Proof

Allocation Agreement. This October 10, 2003, agreement among the United States, CVWD, IID, SDCWA, Metropolitan, and the San Luis Rey Settlement Parties provides for the allocation of water conserved from the All-American Canal Lining Project and the Coachella Canal Lining Project, and Metropolitan's assignment to SDCWA of its rights to water from both canal lining projects.

Agreement Relating to Supplemental Water Among the Metropolitan Water District of Southern California, The San Luis Rey Settlement Parties, and The United States. This October 10, 2003, agreement provides that the United States will furnish to Metropolitan up to 16,000 AF per year of water conserved by the canal lining projects for the benefit of the San Luis Rey Settlement Parties.

Financing

Metropolitan's annual O&M budget (referenced above) incorporates the price that United States pays for Metropolitan's delivery of Exchange Water, which is less than Metropolitan's full-service rate, and the delivery of an equal volume by exchange to SDCWA.

M. Programs Under Development

Expansion of the Palo Verde Irrigation District (PVID) Land Management Program: Additional fallowing agreements may be developed in subsequent years as needed.

A.3.2 California Aqueduct Deliveries

A. State Water Project Deliveries

Source of Supply

The State Water Project (SWP) provides imported water to the Metropolitan service area and has provided from 25 to 50 percent of Metropolitan's supplies. In accordance with its contract with the Department of Water Resources (DWR), Metropolitan has a maximum Table A of 1,911,500 AF per year under contract from the SWP. Actual deliveries have never reached this amount. As shown in this 2025 UWMP, the estimates of SWP deliveries to Metropolitan are based on DWR's draft 2025 SWP Delivery Capability Report (DCR), simulations using a 100-year period from 1922 to 2021, current environmental regulations governing operations in the Delta, and assumptions about water use. The draft 2025 SWP DCR also includes three climate change scenarios for the year 2043.

As part of its contract with DWR, Metropolitan pays both the fixed costs of financing SWP facilities construction and the variable costs of operations, maintenance, power, and replacement costs for water delivered each year. SWP water is transported via the Edmund G. Brown California Aqueduct and delivered to Metropolitan through the East Branch at Devil Canyon Power Plant afterbay, along the Santa Ana Valley Pipeline, and at Lake Perris. Metropolitan also takes delivery of SWP water from the West Branch at Castaic Lake.

Rationale for Expected Supply

Metropolitan and 28 other public entities have contracts with the State of California for SWP water. These contracts require the state, through DWR, to use reasonable efforts to develop and maintain the SWP supply. SWP contractors have the right to participate in the system, with an entitlement to water service from the SWP and the right to use the portion of the SWP conveyance system necessary to deliver water to them. The state has made significant investment in infrastructure. It has constructed 28 dams and reservoirs, 26 pumping and generation plants, and about 660 miles of aqueducts. More than 27 million California residents benefit from SWP water. DWR estimates that with current facilities and regulatory requirements, the project will deliver approximately 2.2 MAF under average hydrology considering regulatory requirements from the 2019 Biological Opinions and the Incidental Take Permit (2020 and 2024).

Historical Record

The historical record shows significant accomplishments by DWR in providing its contractors with SWP water supplies. Through 2023, the SWP has delivered over 114 MAF to its contractors. The maximum annual water supply was delivered in 2017, and totaled 3.77 MAF, exceeding the previous record delivery of 3.75 MAF in 2005. In 2006 and 2011 the project delivered 3.7 MAF. DWR has continued to invest in SWP facilities to deliver water to its contractors.

Written Contracts or Other Proof

1960 Contract between the State of California and The Metropolitan Water District of Southern California for a Water Supply. This contract, initially executed in 1960 and amended numerous times since, is the basis for SWP deliveries to Metropolitan. It requires

DWR to make reasonable efforts to secure water supplies for Metropolitan and its other contractors. The contract was originally set to expire in 2035 but a 50 year extension, to 2085, became effective on 2023.

Financing

Metropolitan's payments for its State Water contract obligation are approved by its Board of Directors via adoption of biennial budgets and currently constitute approximately a third of the annual budget.

Federal, State and Local Permit/Approvals

Operation of the SWP. The DWR is responsible for acquiring, maintaining, and complying with numerous federal and state permits for operation of the SWP. Metropolitan has been active in monitoring the issues affecting its contract with DWR.

EIR for the East Branch Enlargement. In April 1984, DWR prepared and finalized an EIR for the Enlargement of the East Branch of the Governor Edmund G. Brown California Aqueduct.

EIR for the Harvey O. Banks Pumping Plant. In January 1986, DWR prepared and finalized an EIR for the additional pumping units at Harvey O. Banks Delta Pumping Plant.

EIR for the Mission Hills Extension. In 1990, DWR prepared and finalized an EIR for the SWP Coastal Branch, Phase II and Mission Hills Extension.

East Branch Extension Project Phase 1. In 1998, DWR completed an EIR to extend the East Branch of the California Aqueduct to provide service to San Gorgonio Pass Water Agency. Phase 1 was completed in 2002.

State Water Resources Control Board Water Quality Control Plan for the San Francisco/ Sacramento-San Joaquin Delta Estuary (Bay-Delta WQCP), Sacramento-San Joaquin Bay-Delta Estuary Revised Water Right Decision 1641 (D-1641), March 2000.

National Marine Fisheries Service Biological Opinion on Long-Term Operation of the Central Valley Project and the State Water Project, December 2024.

U.S. Fish and Wildlife Service Biological Opinion for the Reinitiation of Consultation on the Coordinated Operations of the Central Valley Project and State Water Project, November 2024.

California Department of Fish and Wildlife Incidental Take Permit for Long-Term Operation of the State Water Project in the Sacramento-San Joaquin Delta, November 2024.

B. Port Hueneme Lease of Ventura Table A

Source of Supply

Metropolitan has a right to delivery of up to 1,850 AF of Table A from the Ventura County Watershed Protection District (Ventura), one of 29 SWP contractors, via a sublease agreement with the Port Hueneme Water Agency (Port Hueneme). United Water Conservation District, one of three agencies holding a contract right to Ventura Table A supply, leases this portion of their total 5,000 AF of Table A to Port Hueneme, who in turn subleases the Table A to Metropolitan. The long-term lease is a condition of the 1996

annexation of the Port Hueneme service area to Calleguas Municipal Water District and Metropolitan.

Expected Supply Capability

The amount of supply available to Metropolitan under the long-term lease is up to 1,850 AF of Ventura Table A. This water supply is in addition to Metropolitan's Table A, and the amount available each year is determined by the SWP allocation, with 1,850 AF available at a 100 percent allocation.

Rationale for Expected Supply

The DWR estimates the amount of supplies that are available each year. Metropolitan uses a forecasting method for SWP deliveries based on historical patterns of precipitation, runoff and actual deliveries of water.

Historical Record

Metropolitan has taken delivery of Port Hueneme Lease water since 1997. These supplies are delivered to Metropolitan from the West Branch of the California Aqueduct and have ranged from 93 AF under a five percent allocation to 1,850 AF under a 100 percent allocation.

Written Contracts or Other Proof

Port Hueneme Water Agency Annexation. By Minute Item 41728, dated January 9, 1996, Metropolitan’s Board adopted Resolution 8487 granting the concurrent annexation of Annexation No. 32 to Calleguas Municipal Water District and The Metropolitan Water District of Southern California, and fixing Metropolitan's terms and conditions for the annexation.

1996 Sublease Agreement. The Port Hueneme and Metropolitan executed a sublease agreement to facilitate annual delivery to Metropolitan of up to 1,850 AF of Ventura Table A that is leased to Port Hueneme by United Water Conservation District.

Financing

Financial obligations to DWR related to the 1,850 AF Port Hueneme Lease supply, including variable transportation charges for delivery, remain the responsibility of the Ventura County Watershed Protection District.

Federal, State, and Local Permits/Approvals

DWR is responsible for acquiring, maintaining, and complying with numerous Federal and State permits for operation of the SWP.

C. Desert Water Agency/Coachella Valley Water District/Metropolitan Water Exchange and Advance Delivery Programs

Source of Supply

The Desert Water Agency (DWA) and CVWD, both in Riverside County, have rights to SWP deliveries, but do not have any physical connections to the SWP facilities. Both agencies are adjacent to the CRA. For DWA and CVWD to obtain water equal to their SWP allocations, Metropolitan has agreed to exchange an equal quantity of its Colorado River water for DWA and CVWD's SWP water. DWA has a SWP Table A contract right of 55.75 TAF per year, and CVWD has a SWP Table A contract right of 138.35 TAF per year, for a total of 194.1 TAF per year. Additionally, CVWD has a long-term water supply agreement for 9.5 to 16.5 TAF annually from Rosedale Rio-Bravo Water Storage District.

Expected Supply Capability

Under the existing agreements, Metropolitan provides water from its CRA to DWA and CVWD in exchange for SWP deliveries. Metropolitan can deliver additional water to its DWA/CVWD service connections, permitting these agencies to store water. When supplies are needed, Metropolitan can then receive its full Colorado River supply, as well as the SWP allocation from the two agencies, while the two agencies can rely on the stored water for meeting their water supply needs. The amount of DWA and CVWD SWP Table A water available to Metropolitan depends on total SWP deliveries and varies from year to year.

In addition to their Table A and long-term water supplies, DWA and CVWD, subject to available capacity, may take delivery of SWP supplies available under Article 21, the Turn-back Pool Program, and non-SWP water supplies they may acquire and convey through the SWP facilities. These other supplies are delivered to DWA and CVWD by exchange with Metropolitan in the same manner as Table A deliveries. DWA and CVWD are participants in the Yuba Dry Year Water Purchase Program. Additionally, DWA participated in the 2009 Drought Water Bank and the 2015-2016 Multi-Year Water Pool Demonstration Program.

Rationale for Expected Supply

The DWR estimates the amount of supplies that are available each year. Metropolitan uses a forecasting method for SWP deliveries based on historical patterns of precipitation, runoff and actual deliveries of water.

Historical Record

DWA and CVWD Exchange Program is currently in operation. The Advance Delivery Agreement has been in place since 1984. Since 1973, Metropolitan has been taking delivery of these agencies' SWP Table A water and has provided equivalent water to those agencies from Metropolitan's Colorado River supplies. Metropolitan has also been delivering water in advance of the amount needed under the exchange agreements. With water having been delivered in advance, Metropolitan can reduce deliveries to DWA and CVWD as needed. The Advance Delivery Account is a key tool for managing abundant SWP supplies. In 2017, Metropolitan managed an 85 percent SWP allocation in part by making 245 TAF of advance deliveries

Written Contracts or Other Proof

1967 and 1983 Water Exchange Contract and Agreements. The DWA and CVWD Program is currently in operation. The DWA and CVWD water exchange contract has been in place since 1967, was amended in 1972, and was modified with execution of additional agreements in 1983.

1984 Advance Delivery Agreement. The Advance Delivery Agreement allows Metropolitan to supply DWA and CVWD with Colorado River water in advance of the time these agencies are entitled to receive water under the exchange agreements. In future years, Metropolitan can recover this water by reducing its deliveries under the exchange agreements.

The 2003 Exchange Agreement. DWA, CVWD, and Metropolitan executed the 2003 Exchange Agreement under which Metropolitan transferred 88.1 TAF and 11.9 TAF of its SWP Table A water to DWA and CVWD, respectively, reducing Metropolitan's Table A volume from 2,011.5 TAF to 1,911.5 TAF. The 2003 Exchange Agreement became operational in calendar year 2005 with the execution of letter agreements among DWA, CVWD, and Metropolitan governing its implementation. The exhibits to the November 9, 2004, and November 19, 2007, letter agreements also modify certain provisions of the Water Exchange Contract and Agreements and the Advance Delivery Agreement.

November 2012 Letter Agreement. CVWD and Metropolitan executed the letter agreement to deliver non-SWP water in exchange for Colorado River water under which CVWD arranged for the delivery of up to 16.5 TAF per year of water to Metropolitan provided by Rosedale-Rio Bravo Water Storage District to CVWD. Metropolitan delivers to CVWD an equal amount of Colorado River water.

2019 Amended and Restated Agreement for Exchange and Advance Delivery. In December 2019, CVWD, DWA, and Metropolitan executed an amendment to the exchange and delivery agreements in order to provide greater certainty for water supply and financial planning, simplify implementation of the exchange, provide Metropolitan with additional revenue, and improve dry-year water supply reliability.

Financing

The funds for deliveries under this Program are included in Metropolitan's O&M budget (referenced above).

Federal, State, and Local Permits/Approvals

DWR is responsible for acquiring, maintaining, and complying with numerous Federal and State permits for operation of the SWP.

July 26, 1983, CVWD Negative Declaration, Whitewater River Spreading Area expansion Phase 1.

February 1983, DWA Final EIR for the proposed extension of time for utilizing Colorado River water to recharge the upper Coachella Valley groundwater basins to the year 2035, Volume I and II, April 1983, Volume III.

September 2002, Final Program EIR for Coachella Valley Water Management Plan and SWP Entitlement Transfer was certified by CVWD on October 8, 2002.

November 2022, CVWD Final EIR for Coachella Valley Water District Whitewater River Groundwater Replenishment Facility Project was certified by CVWD on April 25, 2023.

March 2023 Bureau of Land Management Record of Decision to renew and amend the existing Right-of-way grant for groundwater replenishment purposes on the Whitewater River Groundwater Replenishment Facility.

D. Semitropic Water Banking and Exchange Program

Source of Supply

The agreement between Semitropic Water Storage District (Semitropic) and Metropolitan was executed in February 1994. Semitropic obtains water from the SWP through its contracts with the Kern County Water Agency. SWP supplies are used for irrigation within Semitropic's service area. When this surface water is not available, these growers withdraw water from the underlying aquifer. The agreement between Semitropic and Metropolitan allows Metropolitan to make use of 350 TAF of storage in Semitropic's groundwater basin. In years of plentiful supply, Metropolitan can deliver available SWP supplies to Semitropic through the California Aqueduct. During dry years, Metropolitan can withdraw this stored water. Five other banking partners participate in this Program and use 650 TAF of storage in Semitropic's groundwater basin.

Expected Supply Capability

The Semitropic-Metropolitan Program provides Metropolitan with the capacity to store up to 350 TAF of water under the current agreement. During dry years, Metropolitan can recover its stored water through a combination of direct pumping of the groundwater and delivery of Semitropic's SWP Table A water in the California Aqueduct. In 2014, Metropolitan amended the program to increase the return yield by an additional 13.2 TAF per year, which has since been reduced to 6.7 TAF. The minimum annual yield available to Metropolitan from the program is currently 38.2 TAF, and the maximum annual yield is 229.77 TAF, depending on the available unused capacity and the SWP allocation. The average annual supply capability for a single dry year similar to 1977 is 45 TAF. For a five-year consecutive drought condition similar to the period of 1988-1992, the expected supply capability is 50 TAF.

Rationale for Expected Supply

Historical Record

The Semitropic-Metropolitan Water Banking and Exchange Program has been operational since 1994. With existing agreements, it will continue to operate over the term of 41 years (1994 to 2035). By the end of 2025, the program had 237 TAF in its storage account.

Written Contracts or Other Proof

1992 Turn-in/out Construction, Operation and Maintenance Agreement. This Agreement was executed in 1992 by DWR and Semitropic to allow construction, operation, and maintenance of the Semitropic California Aqueduct Turn in/out.

1993 Temporary Semitropic-Metropolitan Water Banking Agreement. This Agreement was executed in February 1993 by Semitropic and Metropolitan to allow the storage of available Metropolitan supplies in advance of execution of the long-term agreement.

1994 Semitropic/Metropolitan Water Banking and Exchange Agreement. This Agreement was executed in December 1994 by Semitropic and Metropolitan to implement the program for a 41-year term (1994-2035).

1995 Point of Delivery Agreement. This agreement, with DWR, Kern County Water Agency, and Metropolitan, allows Metropolitan to divert water from the California Aqueduct into Semitropic's service area.

1995 Introduction of Local Water into the California Aqueduct. This agreement, with DWR, Kern County Water Agency, and Semitropic, allows Metropolitan to receive water from the program into the California Aqueduct.

2014 Amendment to Increase Program Yield. The amendment increased Metropolitan's minimum return yield by 13,200 acre-feet per year.

Financing

Metropolitan's O&M budget (referenced above) includes payments for the Semitropic Program.

Federal, State, and Local Permits/Approvals

Final EIR. Semitropic, acting as the lead agency under CEQA, and Metropolitan, acting as a responsible agency, jointly completed the EIR for the Program. The EIR was certified by Semitropic in July 1994 and adopted by Metropolitan in August 1994.

Regulatory Approvals. All regulatory approvals are in place, and the program is operational.

E. Arvin-Edison Water Management Program

Source of Supply

The Arvin-Edison Water Storage District (Arvin-Edison) manages the delivery of local groundwater and water imported into its service area from the Central Valley Project's (CVP) Millerton Reservoir via the Friant-Kern Canal. The surface water service area consists of 132,000 acres of predominantly agricultural land, and to a minor degree, municipal and industrial uses. It is situated in Kern County. Arvin-Edison operates its supplies conjunctively, storing water in the underlying aquifer when imported supplies are available and withdrawing that water when the availability of imported supplies is reduced. In 1997, Metropolitan entered into an agreement with the Arvin-Edison Water Storage District. The agreement allows Metropolitan to store available water in Arvin-Edison's groundwater basin, either through direct spreading operations, or through deliveries to growers in Arvin-Edison's service area. Similar to Arvin-Edison's own usage, this previously stored water could be withdrawn when the availability of imported supplies to Metropolitan is reduced.

Expected Supply Capability

The Arvin-Edison/Metropolitan Program provides Metropolitan with the capacity to store up to 350,000 AF of water under the current agreement. During dry years, Metropolitan can recover its stored water either through direct pumping of the groundwater or through exchange. Based on the terms and conditions of the program agreement, the return of water to Metropolitan ranges from a minimum of 40,000 AF per year (peak 4-month summer period) up to 110,000 AF (over a 12-month period). Metropolitan staff are currently

working to overcome a challenge of detections of 1,2,3-trichloropropane (TCP) above the Maximum Contaminant Level (MCL) of five parts per trillion (ppt) in wells that are part of the Arvin-Edison/Metropolitan Program. These levels of TCP impact Metropolitan's ability to put water and take return water under that program. As a result, Metropolitan has temporarily suspended normal operations of the program until the water quality concerns can be further evaluated and managed. In the meantime, Metropolitan and Arvin-Edison continue to participate in surface water exchanges as needed.

Rationale for Expected Supply

Historical Record

The Arvin-Edison/Metropolitan Water Management Program has been operational since 1997. With existing agreements, it will continue to operate over the term of 38 years (1997 to 2035). By the end of 2025, the program had 100,201 AF in its storage account.

Written Contracts or Other Proof

1997 Arvin-Edison/Metropolitan Water Management Agreement. This Agreement was executed in December 1997 by Arvin-Edison and Metropolitan to implement the program for a 30-year term (1997-2027).

1998 Turn-in/out Construction and Maintenance Agreement. This Agreement was executed in 1998 by DWR, Kern County Water Agency, Arvin-Edison, and Metropolitan to allow construction, operation and maintenance of the Arvin-Edison California Aqueduct Turn in/out.

1998-2002 Water Delivery and Return Agreements. These agreements, with DWR, Kern County Water Agency, Arvin-Edison, and Metropolitan, allow Metropolitan to divert water from, and introduce water to, the California Aqueduct.

2004 Point of Delivery Agreement. This agreement, with DWR, Kern County Water Agency, and Metropolitan, allows Metropolitan to divert water from the California Aqueduct into Arvin-Edison's service area.

2004 Introduction of Water into the California Aqueduct. This agreement, with DWR, Kern County Water Agency, and Arvin-Edison, allows Metropolitan to receive water from the program into the California Aqueduct.

2007 First Amended and Restated Agreement Between Arvin-Edison Water Storage District and The Metropolitan Water District of Southern California for a Water Management Program. This amendment increased the maximum storage level to 350 TAF, extended the agreement term to 2035, and provided for the construction of the South Canal Improvement Project. The project increases the reliability of Arvin-Edison returning higher water quality to the California Aqueduct.

Financing

Metropolitan's O&M budget (referenced above) includes payments for the Arvin-Edison Program.

Federal, State, and Local Permits/Approvals

Environmental Status: A Negative Declaration was completed in 1996.

An Addendum to the 1996 Negative Declaration was completed in 2003.

A Negative Declaration for the Arvin-Edison South Canal Improvement Project was completed in 2007.

Regulatory Approvals: All regulatory approvals are in place, and the program is operational.

F. San Bernardino Valley Municipal Water District Program

Source of Supply

The San Bernardino Valley Municipal Water District Program allows Metropolitan to purchase a dependable annual supply, as well as an additional supply for dry-year needs. Under this program, Metropolitan purchases water provided to San Bernardino Valley Municipal Water District (Valley District) from its annual SWP water allocation. Valley District delivers the purchased supplies to Metropolitan's service area through the coordinated use of facilities and interconnections within the water conveyance system of the two districts.

The purchased SWP supply is provided to Metropolitan as direct deliveries of annual SWP water through the California Aqueduct to Metropolitan's service area, as well as deliveries of SWP water to the San Bernardino groundwater basin that will subsequently be delivered to Metropolitan's service area. Under this program, Metropolitan purchases surplus Valley District supplies on a fixed price schedule based on the final SWP allocation each calendar year.

To facilitate the transfer, the program also provides the coordinated use of existing facilities, including the Valley District's Foothill Pipeline and the Inland Feeder, to improve the conveyance capabilities of the delivery of SWP water to the service areas of both districts. The intertie between the Foothill Pipeline and the Inland Feeder has been constructed and was operational as of December 2002. This intertie allows Metropolitan to move SWP water from the East Branch of the California Aqueduct through the Foothill Pipeline and Inland Feeder, into DVL and the CRA. As a result of this intertie, Metropolitan has an alternative conveyance capacity of 260 cfs into Metropolitan's system should an outage occur on the upper section of the Inland Feeder.

Expected Supply Capability

The program changed from the minimum purchase program to a surplus program. Valley District will provide Metropolitan surplus SWP supplies likely in higher than normal SWP allocations. The historical average for the program is expected to be around 13 TAF per year.

Rationale for Expected Supply

Historical Record

The San Bernardino Valley Municipal Water District Program began operations in 2001 and ended in 2016. Since its inception in 2001, this program has delivered 200 TAF to Metropolitan. Metropolitan and Valley District approved a new Coordinated Operating Agreement in 2021 that will provide Metropolitan surplus Valley District supplies and emergency mutual aid.

Written Contracts or Other Proof

Metropolitan's annual and dry-year supplies from the San Bernardino Valley Municipal Water District Program are based on Metropolitan Board actions and agreements.

2000 Board Approval of Coordinated Operating Agreement. In June 2000, Metropolitan's Board authorized entering into a Coordinated Operating Agreement between Metropolitan and Valley District to develop projects that could provide benefits to both districts through the coordinated use of facilities and SWP supplies.

2000 Coordinated Operating Agreement. The Coordinated Operating Agreement between Metropolitan and Valley District was executed in July 2000.

2001 Board Approval of the Coordinated Use Agreement. In April 2001, Metropolitan's Board authorized entering into the Coordinated Use Agreement for Conveyance Facilities and SWP Water Supplies between Metropolitan and Valley District for the purchase of dependable annual and dry year supplies by Metropolitan.

2001 Coordinated Use Agreement. The Coordinated Use Agreement for Conveyance Facilities and SWP Water Supplies between Metropolitan and Valley District for the purchase of dependable annual and dry year supplies by Metropolitan was executed May 2001. The Agreement is effective as of July 1, 2001, for an "evergreen" term (10-years with automatic annual extensions unless otherwise notified).

2021 Coordinated Operating Agreement. The Coordinated Operating Agreement between Metropolitan and Valley District was approved by Metropolitan's Board in March 2021. The agreement will terminate on December 31, 2035 unless there is an extension of the SWP Contract.

Financing

Metropolitan's O&M budget (referenced above) includes the funds to purchase Program water.

Federal, State, and Local Permits/Approvals

The Program became effective July 1, 2001. An environmental review process and regulatory approval supported implementation.

Final EIR. Final Regional Water Facilities Master Plan EIR dated February 1, 2001, was certified by Valley District, as lead agency, and by Metropolitan, as responsible agency. Notices of determinations were filed by Valley District and Metropolitan on May 29, 2001, and April 18, 2001, respectively.

State Water Contractors' Review. In May 2001, the SWC reviewed and issued a letter supporting the program.

DWR Review. DWR agreed to the program in December 2001.

G. Antelope Valley-East Kern Water Agency Exchange and Storage Program

Source of Supply

The Antelope Valley-East Kern Water Agency (AVEK) Program allows Metropolitan to both store and exchange SWP supplies to provide additional water for normal and dry year needs. Under the storage program, Metropolitan, at its discretion, could store at least 30 TAF of its SWP supply or other supplies in the Antelope Valley Groundwater Basin in an account designated for Metropolitan.

Through an uneven (2:1) exchange program, AVEK would provide at least 30 TAF over ten years of its unused SWP supply to Metropolitan. Metropolitan, at its discretion, would return half the exchange water to AVEK at Banks pumping plant. At this time, the parties have not implemented the exchange program element.

Expected Supply Capability

The average annual supply capability for a single dry year similar to 1977 is 3 TAF for each program. For a five-year consecutive drought condition similar to the period of 1988-1992, the expected supply capability is 4 TAF for each program.

Rationale for Expected Supply

Historical Record

The AVEK Program started providing benefits in 2017. By the end of 2025, the program had 30 TAF in its storage account.

Written Contracts or Other Proof

Metropolitan's dependable annual and dry-year supplies from the AVEK Exchange and Storage Program are based on Metropolitan Board action and proposed agreement.

2015 Board Approval of the AVEK Exchange and Storage Agreement. In November 2015, Metropolitan's Board authorized entering into the agreement with AVEK.

Financing

Metropolitan's Board authorized up $16.6 million for the program with additional funds, if needed, from Metropolitan's O&M budget (referenced above).

Federal, State, and Local Permits/Approvals

The storage element of the Program became effective after the agreement was executed in 2016.

The exchange element of the Program has not been implemented.

CEQA Compliance. The proposed action involved an exchange and purchase agreement associated with the leasing, licensing, and operating of existing public water conveyance facilities with negligible or no expansion of use and no possibility of significantly impacting the physical environment.

H. High Desert Water Bank

Source of Supply

The High Desert Water Bank with Antelope Valley-East Kern Water Agency (AVEK) allows Metropolitan to store supplies to provide additional water for normal and dry year needs. Metropolitan has a storage capability in the groundwater basin, with a total capacity of 280 TAF, and a dry year return capability of 70 TAF. The program is modeled to be fully operational in 2030.

Expected Supply Capability

The High Desert Water Bank is currently under design and construction. When the High Desert Water Bank is completed, the program would provide 70 TAF of additional water supply capability in a dry year.

Rationale for Expected Supply

Historical Record

Metropolitan started storing water in September 2023. By the end of 2025, the program had 45 TAF in its storage account.

Written Contracts or Other Proof

2019 Board Approval of the High Desert Water Bank Agreement. In April 2019, Metropolitan's Board authorized entering into the agreement with AVEK.

2023 Board Approval of Additional Costs to the High Desert Water Bank. In September 2023, Metropolitan's Board authorized changes to the design, construction, and operations of the Water Bank facilities.

Financing

In 2019, Metropolitan's Board authorized up $131 million for construction of the program with additional funds for program operation.

In 2023, Metropolitan's Board authorized up to $80 million for additional costs associated with the changes of design, construction, and operations of the Water Bank facilities.

Federal, State, and Local Permits/Approvals

CEQA Compliance. The Metropolitan Board reviewed and considered AVEK's adopted Mitigated Negative Declaration and took related CEQA action.

I. Bay-Delta Improvements

Source of Supply

Improving the water supply reliability of the State Water Project (SWP) is a primary focus of Metropolitan's long-term planning efforts. Metropolitan's strategy is to reduce its dependence on SWP supplies during dry years, when risks to the Bay-Delta ecosystem are greatest, and to maximize its deliveries of available SWP water during wetter years to store in surface reservoirs and groundwater basins for later use during droughts and emergencies.

State resource agencies and various water user entities are currently engaged in the development of the Delta Conveyance Project (DCP), which would include new diversion and conveyance facilities in the Delta necessary to restore and protect the reliability of SWP water deliveries south of the Delta, consistent with the State's Water Resilience Portfolio. The DCP objectives are to address sea level rise, climate change and extreme weather events; minimize the potential for public health and safety impacts from reduced quantity and quality of SWP water deliveries south of the Delta resulting from a major earthquake that causes breaching of Delta levees; protect the ability of the SWP to deliver water when hydrologic conditions result in the availability of sufficient amounts, consistent with the requirements of state and federal law and contractual commitments; and to provide operational flexibility to improve aquatic conditions in the Delta and better manage risks of further regulatory constraints on project operations.

The SWP conveys water from the western slope of the Sierra Nevada to water users both north and south of the Bay-Delta. Specifically, SWP water is delivered to Metropolitan's service area through a system of reservoirs, the Bay-Delta, pumping plants, and the California Aqueduct. Owned and operated by the California Department of Water Resources (DWR), the SWP provides municipal and agricultural water to 29 State Water Contractors. Annual deliveries for the SWP average about 2.5 MAF. Municipal uses account for about 60 percent of annual deliveries, with the remaining 40 percent going to agriculture.

SWP supplies are estimated using the 2025 Draft SWP Delivery Capability Report distributed by DWR in October 2025. The 2025 Draft Delivery Capability Report presents the current DWR estimate of the amount of water deliveries for current (2025) conditions and conditions 20 years in the future. These estimates incorporate regulatory requirements in accordance with the SWRCB Water Quality Control Plan, the USFWS and NMFS biological opinions and the CDFW Incidental Take Permit. In addition, these estimates include an extension of the modeling period for an additional six years and an updated baseline projected hydrology that incorporates the changes in climate that have already occurred. Future capability estimates also reflect additional potential impacts of climate change and sea level rise under multiple risk-based scenarios. Under the 2025 Draft Delivery Capability Report, the delivery estimates for the SWP for 2025 conditions as percentage of Table A amounts are 5 percent, equivalent to 97 TAF for Metropolitan, under a single dry-year (1977) condition and 54 percent, equivalent to 1.03 MAF for Metropolitan, under long-term average conditions.

In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley/SWP storage and transfer programs. The goal of these storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the available Banks pumping capacity to maximize deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

Delta Conveyance Project

In 2000, several state and federal agencies released the CALFED Bay Delta Programmatic Record of Decision (ROD) and Environmental Impact Report/Environmental Impact Statement (EIR/EIS) that outlined and disclosed the environmental impacts of a 30-year

plan to improve the Bay-Delta's ecosystem, water supply reliability, water quality, and levee stability. The CALFED ROD remains in effect and many of the state, federal, and local projects begun under CALFED continue.

Building on CALFED and other Bay-Delta planning activities, in 2006 multiple state and federal resource agencies, water agencies, and other stakeholder groups entered into a planning agreement for the Bay-Delta Conservation Plan (BDCP). The BDCP was originally conceived as a comprehensive conservation strategy for the Bay-Delta designed to restore and protect ecosystem health, water supply, and water quality within a stable regulatory framework to be implemented over a 50-year time frame with corresponding long-term permit authorizations from fish and wildlife regulatory agencies. The BDCP included both alternatives for new water conveyance infrastructure and extensive habitat restoration in the Bay-Delta.

In 2015, state and federal lead agencies proposed an alternative implementation strategy and new alternatives to the BDCP to provide for the protection of water supplies conveyed through the Bay-Delta and the restoration of the ecosystem of the Bay-Delta, termed "California WaterFix" and "California EcoRestore," respectively. In this alternative approach, DWR and the Bureau of Reclamation would implement planned water conveyance improvements as a stand-alone project. Ecosystem improvements and habitat restoration more generally (California EcoRestore) would be undertaken under a more phased approach than previously contemplated by the BDCP and would not be linked with the California WaterFix project or permits.

In February 2019, in his State of the State address, Governor Newsom announced support for a single tunnel project. Consistent with the Governor's direction, DWR withdrew all approvals and environmental compliance documents associated with California WaterFix, and in May 2019 DWR began planning for a single tunnel project. DWR is pursuing the DCP to improve the reliability and operational flexibility of the SWP given historical, emerging, and future risks from climate change, sea level rise, levee failure, and regulatory restrictions. On January 15, 2020, DWR issued a Notice of Preparation of Environmental Impact Report for the Delta Conveyance Project.

On December 8, 2020, the Metropolitan Board authorized the General Manager to execute a funding agreement for the recommended share of 47.2 percent (up to $160.8 million) for planning and preconstruction costs for the DCP. The money Metropolitan provided to DWR under that agreement has been used to complete the Final EIR documenting design and operational refinements under CEQA, all major permit applications and supporting documentation, preliminary design to support environmental review, a cost estimate, and a benefit-cost analysis. Part of this effort also included Tribal consultation, outreach to environmental justice communities and advocates, and stakeholder engagement to avoid and reduce community impacts and coordination with responsible and trustee state and federal agencies.

At its December 10, 2024 Board meeting, Metropolitan's Board authorized the General Manager to enter into an amended agreement for preconstruction work planned for 2026-2027. Metropolitan's commitment level for this tranche of funding totals $141.6 million, equivalent to a participation level of 47.2 percent. Based on modeling results reported in

the 2024 Benefit-Cost Analysis of the DCP, the expected long-term annual yield of the project for all participants is over 400 TAF.

Although it is described in this appendix as a project with significant potential benefit for Metropolitan's future supply reliability, the DCP is not included in Metropolitan's 2025 UWMP supply projections.

Sites Reservoir Project

Sites Reservoir first emerged as part of a second stage of the SWP proposed in the 1980s, which included a peripheral canal and other northern California water-related projects. In 1996, the project was further analyzed by DWR and USBR as part of the CALFED Bay-Delta process. The CALFED process resulted in a Programmatic Record of Decision that recommended implementation of the project as a component of the Preferred Program Alternative. In 2010, the Sites Project Authority was formed as a joint powers authority to continue moving forward with development of the Sites Reservoir project.

Sites Reservoir would be located north of Sacramento, about 10 miles west of the town of Maxwell. The project includes water storage reservoir 1.5 MAF and would require the construction of two large dams up to 310 feet high and nine smaller saddle dams. The water stored in the reservoir would be diverted from the Sacramento River during high flow events and returned to the Sacramento River during dry and critical years, thereby providing additional dry-year water for environmental flows and project partners including SWP agencies south of the Delta.

The current operations model estimates the annual water yield of the Sites Reservoir Project at approximately 270 TAF per year by 2032, when the Sites Reservoir Project is scheduled to be operational. This model utilizes upstream Sacramento River flow and fishery criteria, assumed in earlier phases of the Project. Additional modeling analyses will continue to be conducted as further refinements are made to Project operations and projected regulatory requirements, including proposed Delta Conveyance operations. Implementation of the proposed Delta Conveyance Project would allow for greater yields south of the Delta. The Sites Project Authority estimates that if the Sites Reservoir Project were operational in water year 2025 (categorized as an 'above-normal' water year for the Sacramento River), the reservoir could have captured over 550 TAF of water supplies. Final project formulation and annual operations will determine how the firm yield will be divided between meeting water supply and environmental improvements funded by state Proposition 1 grant and federal Water Infrastructure Investment for the Nation (WIIN) Act appropriations.

In 2017, the Sites Project Authority and United States Bureau of Reclamation (USBR) prepared a joint Public Draft Environmental Impact Report / Environmental Impact Statement (EIR/EIS) for the Sites Reservoir Project. In November 2021, the Sites Project Authority and USBR issued a Revised Draft Environmental Impact Report/Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) to reflect changes to the project that occurred since the issuance of the 2017 Draft EIR/EIS. The RDEIR/SDEIS included a complete revision of the 2017 Draft EIR/EIS and was circulated for public review and comment. The Sites Project Authority and USBR prepared responses to all comments received on the RDEIR/SDEIS and included responses in the Final EIR/EIS for the project. The Authority certified the Final EIR and approved the project on November 17, 2023. A

Notice of Determination was prepared and filed with county clerk-recorders and the State Clearinghouse on November 20, 2023.

On December 18, 2023, petitioners, including the Friends of the River, Center for Biological Diversity, California Sportfishing Protection Alliance, California Water Impact Network, and Save California Salmon notified the Authority of their intent to file a petition for Writ of Mandate in Yolo County Superior Court under the provisions of the CEQA against the Authority, challenging the Authority's November 17, 2023 certification of the Final EIR, CEQA findings, and approval of the project. On May 31, 2024, the Yolo Superior Court found in favor of the Sites Authority on all causes of action. On June 14, 2024, Friends of the River, et al., appealed the case. On September 20, 2024, the Third District Court of Appeals upheld the trial court's judgment. No petition for review was filed to the State Supreme Court, ending the litigation.

To ensure compliance with the federal ESA, the Sites Reservoir Project has been included as a programmatic action in the recently issued 2024 Biological Opinions for the Reinitiation of Consultation on the Long-Term Operation of the CVP and the SWP, issued by the U.S. Fish and Wildlife Service (FWS) and the NMFS. In addition, the Sites Project Authority and USBR are working toward obtaining project-specific operational Biological Opinions. These are anticipated in the summer of 2026.

USBR prepared a Record of Decision (ROD) that was completed and signed in early 2026.

The Sites Project Authority received CESA incidental take coverage for all species identified in the Operations Incidental Take Permit (ITP) application and the 2024 supplemental application. Covered species include winter-run Chinook salmon, spring-run Chinook salmon, Delta smelt, longfin smelt, and white sturgeon, a candidate species. The Operations ITP became effective upon issuance and will remain in effect through December 31, 2039, unless renewed by CDFW.

The Sites Project Authority petitioned the State Water Board for the assignment of a 1977 water right application for the Sites Reservoir Project, and for the release from water right priority of previously filed water right applications. If the Water Board grants the petition, the Sites Project Authority would have a new appropriative water right to divert up to 1.5 MAF to storage with a 1977 water right priority. The public hearing is in its final phase as all evidence has been presented, including rebuttal testimony, and all witnesses have been subject to cross-examination. The State Water Board has notprovided a schedule for its final decision-making on the petition which should conclude in 2026.

Although it is described in this appendix as a project with significant potential benefit for Metropolitan's future supply reliability, Sites Reservoir is not included in Metropolitan's 2025 UWMP supply projections.

Water Quality Control Plan for the Bay-Delta/Voluntary Agreements

The SWRCB is responsible for adopting and updating the Water Quality Control Plan for the San Francisco Bay/Sacramento–San Joaquin Delta Estuary (Bay-Delta Plan), which establishes water quality control objectives and flow requirements needed to provide reasonable protection of beneficial uses in the watershed. The SWRCB has been engaged for many years in updating the Bay-Delta Plan.

The Bay-Delta Plan is being updated through phases. Phase 1 updated the Bay-Delta Plan objectives for the San Joaquin River and its major tributaries and the southern Delta salinity objectives. Phase 2 is updating the objectives for the Sacramento River and Delta and their major tributaries (Plan amendments). On December 12, 2018, through State Water Board Resolution No. 2018-0059, the State Water Board adopted the Phase 1 Plan amendments and Final SED establishing the Lower San Joaquin River flow objectives and revised southern Delta salinity objectives. On February 25, 2019, the Office of Administrative Law approved the Plan amendments. This plan requires an adaptive range of 30-50 percent of the unimpaired flow to be maintained from February through June in the Stanislaus, Tuolumne, and Merced Rivers, with a starting point of 40 percent of the unimpaired flow. During this same time period, the flows at Vernalis on the San Joaquin River, as provided by the unimpaired flow objective, are required to be no lower than a base flow of 1,000 cubic feet per second (cfs), with an adaptive range between 800 and 1,200 cfs, inclusive. The plan also updated the South Delta salinity standards for protecting agricultural beneficial uses. While this part of the plan was updated, there is ongoing litigation challenging the updated plan and has not yet been implemented.

The SWRCB is also considering Phase 2 Plan amendments focused on the Sacramento River and its tributaries, Delta eastside tributaries (including the Calaveras, Cosumnes, and Mokelumne rivers), Delta outflows, and interior Delta flows. The SWRCB staff's initial proposal was an adaptive range of 45-65 percent unimpaired flow objective with a starting point of 55 percent.

In 2018, the State and several water users proposed an alternative to the SWRCB staff's recommendation for the Phase 2 Bay-Delta Plan update, known as the Healthy Rivers and Landscapes (HRL) Program, previously referred to as Voluntary Agreements. The HRL includes flow commitments and funding for flow commitments, habitat actions, and a robust science program. The HRL provides an opportunity to combine flow and habitat actions to protect fish and wildlife beneficial uses of water, while providing certainty for water users. It also offers a chance to avoid years of hearings and litigation and to instead begin implementation of the updated Bay-Delta Water Quality Control Plan upon adoption by the SWRCB. The HRL would be concurrently implemented with the unimpaired flow approach (for non-HRL participants) and was included in the most recent draft of the Program of Implementation for the Plan. The Phase 2 Plan amendments are scheduled to be adopted by the end of 2025.

Rationale for Expected Supply

Implementation Status

Expected supplies are projected in accordance with the approved implementation.

Written Contracts or Other Proof

Metropolitan Board Actions and Policies:

Revision and Restatement of Bay-Delta Policies Adopted October 2022.

Execution of Initial Funding Agreement approved in December 2008.

Execution of Amendments to Planning Agreement approved in December 2009.

Execution of Planning Agreement Amendment (additional funds) approved in July 2010.

Execution of Amendment to Memorandum of Agreement approved in August 2011.

Authorized Funding and Entered into Project Agreement with Sites Project Authority for Phase 1, April 2017.

Authorized Funding and Entered into Project Agreement with Sites Project Authority for 2019 Workplan, February 2019.

Appropriated Funding and Authorized Amendment to 2019 Reservoir Project Agreement with Sites Project Authority to Allow Participation in Phase 2 Workplan, November 2020.

Board action on “Water Management Tools” approved February 2021.

Board vote on California WaterFix, October 2017.

Board vote on California WaterFix, July 2018.

Board vote on Funding Agreement with DWR for Metropolitan’s share of the Delta Conveyance Project planning and pre-construction costs, and execution of an amendment to the Joint Powers Agreement for Delta Conveyance Design and Construction Authority, December 2020.

Board vote on entering into an amended planning agreement for Delta Conveyance Project preconstruction work planned for 2026-2027, December 2024.

Supporting Agreements and Contracts:

Bay-Delta Accord approved in December 1994.

CALFED Framework, June 2000.

Lower Yuba River Accord, May 2008.

Delta Reform Act Legislation enacted in 2009.

State and Federal Funding:

Proposition 204 funds approved by voters in November 1996.

Proposition 13 funds approved by voters in March 2000.

Proposition 50 funds approved by voters in November 2002.

Proposition 1, approved by the voters in 2014, authorized $7.545 billion in general obligation bonds for state water supply infrastructure projects, including surface and groundwater storage, ecosystem and watershed protection and restoration, and drinking water protection.

Annual federal appropriations from 1998 to present, authorized in annual Energy and Water Development Appropriations bills and the CALFED Bay-Delta Authorization Act.

California Water Commission approved $816 million of Proposition 1 funding for Sites Reservoir, July 2018

Financing

The Delta Conveyance Project would be paid for by public water agencies that would receive the water supply reliability benefits.

Federal, State, and Local Permits/Approvals

CALFED's Bay-Delta Program.

CALFED Programmatic EIR/EIS finalized in July 2000.

Record of Decision issued in August 2000 for the final Programmatic EIR/EIS regarding the CALFED Bay-Delta Program.

K. Kern Delta Water Management Program

Source of Supply

In December 1999, Metropolitan advertised a request for proposals for participation in "The California Aqueduct Dry-year Transfer Program." As a result of this request for proposals, four programs, including one from the Kern Delta Water District (Kern Delta), were selected for further consideration. In 2001, Metropolitan entered into Principles of Agreement with Kern Delta for the development of a dry-year supply program. Kern Delta serves actively farmed, highly productive farmland located in the San Joaquin Valley portion of southern Kern County. Kern Delta has under contract 180 TAF per year of pre-1914 Kern River water and 25.5 TAF per year of SWP Table A contract right (under contract with Kern County Water Agency).

The dry-year supply program between Kern Delta and Metropolitan involves the storage of water with Kern Delta. In years of plentiful supply, the agreement allows Metropolitan to store water in Kern Delta's groundwater basin, either through direct spreading operations or through deliveries to growers in Kern Delta's service area. Metropolitan has the ability to store up to 250 TAF of water. Agreement provisions may allow for storage beyond this amount. When needed, Metropolitan can recover its stored water either through direct pumping of the groundwater or exchange at a rate of 50 TAF per year. The program duration is from 2002 to 2027 with provisions that allow the water to be withdrawn until 2033.

Expected Supply Capability

The Kern Delta/Metropolitan Water Management Program provides Metropolitan with the capacity to store up to 250 TAF of water. When needed, Metropolitan can recover its stored water either through direct pumping of the groundwater or exchange at a rate of 50 TAF per year.

Rationale for Expected Supply

Implementation Status

Expected supplies are projected in accordance with accepted detailed groundwater modeling that has been accomplished for the program. The Kern Delta/Metropolitan Water Management Program began accepting water for storage in fall 2003. By the end of 2025, the program had 142 TAF in its storage account.

Written Contracts or Other Proof

2001 Kern Delta/Metropolitan Principles of Agreement. Principles of agreement were entered into between Kern Delta and Metropolitan in June 2001, covering program costs, operational aspects, and risks/responsibilities.

2002 Kern Delta and Metropolitan Boards of Directors Approval. These actions approved execution of the long-term agreement, which delineates program operations, costs, and risks/responsibilities.

Financing

Metropolitan's O&M budget (referenced above) includes payments for the Kern Delta/ Metropolitan Program.

Federal, State, and Local Permits/Approvals

Kern Delta, acting as lead agency under CEQA, has prepared a full EIR. As part of this EIR, Kern Delta published a Notice of Preparation and held meetings with the general public, interested agencies, and resource agencies. In November 2002, the Final EIR was certified by Kern Delta and adopted by Metropolitan.

L. Central Valley / State Water Project Storage and Water Transfers

Source of Supply

Around 34 MAF of water (80 percent of California's developed water) is delivered for agricultural use every year. Over half of this water is used in the Central Valley. Much of it is delivered by, or adjacent to, SWP and Central Valley Project (CVP) conveyance facilities. This allows for the voluntary transfer of water to many urban areas, including Metropolitan's service area, via the California Aqueduct.

In recent years, a portion of this agricultural water supply has been secured by Metropolitan through mutually beneficial transfer agreements:

The Governor's Water Bank (Bank) in 1991, 1992, 1994, and 2009 secured 75 to 820 TAF per year of water supply. Further, the DWR's Dry Year Water Purchase Program (Purchase Program) in 2001, 2002, and 2003 secured a total of 162 TAF. DWR established and administered the Bank and the Purchase Program by facilitating purchasing water from willing sellers and transferring the water to those with critical needs using the SWP facilities. Sellers, such as farmers and water districts, made water available for the Bank and Purchase Program by fallowing crops, shifting crops, releasing surplus reservoir storage, and by substituting groundwater for surface supplies.

In 2003, Metropolitan secured options to purchase approximately 145 TAF of water from willing sellers in the Sacramento Valley during the irrigation season. Using these options, Metropolitan purchased approximately 125 TAF of water which ultimately was not conveyed due to improved hydrologic conditions.

In 2005, Metropolitan, in partnership with three other SWP contractors, secured options to purchase approximately 130 TAF of water from willing sellers in the Sacramento Valley during the irrigation season, of which Metropolitan's share was 113 TAF. Metropolitan also had the right to assume the other SWP contractors' options if they chose not to exercise their options. Due to improved hydrologic conditions, Metropolitan and the other SWP contractors did not exercise these options.

In December 2007, Metropolitan entered into a long-term agreement with DWR providing for Metropolitan's participation in the Yuba Dry Year Water Purchase Program between Yuba County Water Agency and DWR that was approved by the SWRCB as part of the

Yuba River Accord. This program provides for transfers of water from the Yuba County Water Agency during dry years through the year 2025, and Metropolitan has purchased approximately 250 TAF. Metropolitan engaged in negotiations with DWR, Yuba County Water Agency, and other participating contractors to extend the Yuba Accord long-term transfer program through 2050.

In 2008, Metropolitan, in partnership with eight other SWP contractors, purchased approximately 40 TAF of water from willing sellers in the Sacramento Valley during the irrigation season, of which Metropolitan's share was approximately 27 TAF.

In 2009, Metropolitan participated in the Governor's Water Bank, which purchased approximately 74 TAF, of which Metropolitan's share was approximately 36.9 TAF.

In 2010, Metropolitan in partnership with three other SWP contractors, secured approximately 100 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was approximately 88 TAF.

In 2010, Metropolitan purchased approximately 18 TAF of water from CVP contractors located in the San Joaquin Valley. In addition, Metropolitan entered into an unbalanced exchange agreement that resulted in Metropolitan receiving approximately 37 TAF.

In 2015, Metropolitan, in partnership with eight other SWP contractors, secured approximately 20 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was approximately 12 TAF.

In addition, Metropolitan has secured water transfer supplies under the Multi-Year Water Pool Demonstration Program. In 2013, 2015, and 2016, Metropolitan secured 30 TAF, 1.3 TAF, and 7 TAF, respectively. Unlike the other transfer programs discussed herein, which were derived from agricultural sellers, a portion of these transfer supplies came from urban sellers.

In 2021, Metropolitan, in partnership with nine other SWP contractors, secured approximately 9 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was approximately 6 TAF.

In 2022, Metropolitan, in partnership with eight other SWP contractors, secured approximately 14 TAF of water from willing sellers in the Sacramento Valley, of which Metropolitan's share was approximately 8 TAF.

In 2025, Metropolitan executed multi-year option agreements with two sellers in the Feather River service area, Western Canal Water District and Richvale Irrigation District. Under the agreements, Metropolitan paid each agency a one-time option payment of $250,000 for the first right to call on up to approximately 53 TAF of their transfer supplies during 2025 through 2027. Metropolitan did not request to purchase supplies in 2025 due to favorable water supply and storage conditions.

Expected Supply Capability

The effect of the 2024 National Marine Fisheries Service's and United States Fish and Wildlife Service's biological opinions and the 2024 California Department of Fish and Wildlife's Incidental Take Permit limit how the CVP and SWP will be operated to facilitate water transfers. Restrictions to diversions at the CVP and SWP diversion facilities during winter and spring require the CVP and SWP to rely on more diversions during the summer

and fall. With increased CVP and SWP diversions in the summer, there is less capacity for transferring water through the SWP and CVP facilities during the transfer window, July through November. There are also limits on the CVP's ability to use the SWP's facilities for water transfers, particularly when the SWP is under heightened export limits, which could impact how water transfer deals are structured.

Rationale for Expected Supply

Historical Record

Metropolitan has made rapid progress in developing SWP transfer programs. This progress may be attributed to several factors, including Metropolitan dedicating additional staff to identify, develop, and implement SWP transfer programs; increased willingness of Central Valley agricultural interests to enter into transfer programs with Metropolitan; and Metropolitan staff's ability to work with DWR and USBR staff to facilitate SWP storage and transfer programs. The availability of dry year supplies has been demonstrated by the annual water purchase programs described above. In addition, Metropolitan participates in longer-term programs to secure water, like the Yuba Accord and the Multi-Year Water Pool Demonstration Program.

The historical record for purchases from the Bank, Purchase Program, Metropolitan-initiated Central Valley programs, Yuba Accord, and Multi-Year Demonstration Program, as well as the number of sellers and buyers participating in these Programs, are strong indicators that there are significant amounts of water that can be purchased through spot market or long-term water transfers during dry years. However, the quantity of transfer supply available in the most critically dry years (for example, 2021 and 2022) is limited. This historical record from 1991 through 2022 is summarized in Table A.3-1 below. Metropolitan did not purchase supplies from dry year transfer programs from 2017 through 2020, and from 2023 through 2025.

Approximately 20 to 35 percent of these north of the Delta water transfers are dedicated to improving Delta water quality to comply with regulations governing Delta pumping.

Written Contracts or Other Proof

With near record-low precipitation in California in recent years, several executive orders were issued by the governor to expedite processing of water transfers within the state:

Executive Order B-21-13 (May 20, 2013): The Department of Water Resources and the State Water Resources Control Board are to "take immediate action to address the dry conditions and water delivery limitations by doing the following: … (1) Expedite processing of one-year water transfers for 2013 and assist water transfer proponents and suppliers as necessary, provided that the transfers will not harm other legal users of water and will not unreasonably affect fish, wildlife, or other in-stream beneficial uses; (2) The SWRCB shall expedite review and processing of water transfer petitions in accordance with the applicable provisions of the Water Code; (3) The DWR shall expedite and facilitate water transfer proposals in accordance with applicable provisions of the Water Code..."

January 1, 2014 Drought Proclamation: "The Department of Water Resources and the State Water Resources Control Board will expedite the processing of water transfers, as called for in Executive Order B-21-13. Voluntary water transfers from one water right holder to another enables water to flow where it is needed most."

April 25, 2014 Drought Proclamation: "The Department of Water Resources and the State Water Resources Control Board will immediately and expeditiously process requests to move water to areas of need, including requests involving voluntary water transfers, forbearance agreements, water exchanges, or other means. If necessary, the Department will request that the Water Board consider changes to water right permits to enable such voluntary movements of water."

Executive Order B-29-15 (April 1, 2015): "The Department shall immediately consider voluntary crop idling water transfer and water exchange proposals of one year or less in duration that are initiated by local public agencies and approved in 2015 by the Department subject to the criteria set forth in Water Code section 1810." [This executive order incorporated by reference the previous drought proclamations.]

In February 2021, Metropolitan's Board approved a water management amendment to the State Water Contract that provides greater water management flexibility with transfers and exchanges of SWP water within the SWP service area. The amendment will provide increased opportunities among the SWP contractors to work together on programs that will improve the management of existing SWP water.

May 20, 2021 Emergency Drought Proclamation: "To support voluntary approaches where hydrology and other conditions allow, the Department of Water Resources and the State Water Resources Control Board (Water Board) shall expeditiously consider requests to move water, where appropriate, to areas of need, including requests involving voluntary water transfers, forbearance agreements, water exchanges, or other means. Specifically, the Department of Water Resources and Water Board shall prioritize transfers that retain a higher percentage of water in upstream reservoirs on the Sacramento, Feather, and American Rivers for release later in the year. If necessary, the Department of Water Resources shall request that the Water Board consider changes to water rights permits to enable such voluntary movements of water."

March 28, 2022 Executive Order N-7-22: "To increase resilience of state water supplies during prolonged drought conditions, the Department of Water Resources shall prepare for the potential creation and implementation of a multi-year transfer program pilot project for the purpose of acquiring water from willing partners and storing and conveying water to areas of need."

Table A.3-1
Historical Record of MWD Central Valley Water Transfers

Program	Purchases (AF per year)		Participants	
	Total	Metropolitan	Sellers	Buyers
1991 Governor's Water Bank	820,000	215,000	351	13
1992 Governor's Water Bank	193,246	10,000	18	16
1994 Governor's Water Bank	220,000	100	6	15
2001 Dry-Year Purchase Program	138,806	80,000	9	8
2003 MWD Water Transfer Program	146,230[1]	126,230	11	1
2005 SWC Water Transfer Program	127,275[2]	0	3	4
2008 SWC Water Transfer Program	39,152	26,621	4	8
2009 Governor's Water Bank	74,505	36,900	10	9
2010 SWC Water Transfer Program	98,959	88,159	11	4
2013 Multi-Year Water Pool Demo	92,232	30,000	4	9
2015 Multi-Year Water Pool Demo	3,000	1,374	1	14
2015 SWC Water Transfer Program	19,686	12,358	5	9
2016 Multi-Year Water Program	15,000	6,871	2	9
2018 SWC Water Transfer Program[3]	140,272	0	17	2
2020 SWC Water Transfer Program[3]	47,094	0	10	4
2021 SWC Water Transfer Program	9,486	5,588	4	10
2022 SWC Water Transfer Program	14,190	8,304	5	9

1. Quantities denote options Metropolitan secured, of which 20,000 AF were not exercised due to improved hydrologic conditions.
2. Quantities denote options Metropolitan secured but were not exercised due to improved hydrologic conditions.
3. Metropolitan elected not to purchase transfer supplies via the program.

Agreements Between Sellers and Buyers. Since 1991, Metropolitan has entered into Central Valley water transfer agreements in fourteen years with sellers, or DWR acting in an intermediary capacity for the Drought Water Bank. The essential terms and conditions for negotiating purchases, including maximum offering price, quantity of water needed, and the timing of delivery, were established in these agreements.

1999 Board Directive. Metropolitan's Board has authorized water transfers in accordance with the Water Surplus and Drought Management Plan (WSDM Plan) adopted in April 1999. The WSDM Plan is a comprehensive policy guideline for managing Metropolitan's water supply during periodic surplus and shortage conditions. During shortage conditions, the plan specifies the type, priority, and timing of drought actions, including the purchase of transfers on the spot market that could be taken in order to prevent or mitigate negative impacts on retail demands.

Financing

Funds for Central Valley water transfers are included in Metropolitan's O&M budget (referenced above).

Federal, State, and Local Permits/Approvals

Environmental documentation for the Drought Water Bank. In November 1993, DWR prepared and finalized a programmatic EIR for the operation of the Drought Water Bank during future drought events. In 2009, an emergency CEQA exemption was issued to support the Drought Water Bank.

Individual CEQA and NEPA documents for Metropolitan's 2003, 2005, and 2008 Central Valley water transfer programs. Individual sellers prepared CEQA documentation to support their transfers. In addition, the USBR prepared NEPA documentation for those transfers requiring federal approval.

M. Mojave Storage Program

Source of Supply

Water from Metropolitan's SWP supply is delivered to Mojave Water Agency (Mojave) through SWP facilities for deposit into an exchange account managed by Mojave. Returns to Metropolitan are made on an acre-foot-for-acre-foot basis (i.e., no losses) at Metropolitan's request by exchange with Mojave's SWP supplies delivered through SWP facilities, subject to rules reserving a minimum annual SWP supply for use by Mojave.

Expected Supply Capability

Through 2021, Metropolitan was able to annually withdraw the Mojave's SWP contractual amounts in excess of 10 percent. After 2021, the withdrawal rate decreased, reserving 20 percent of Mojave's SWP contractual amounts. Under a 100 percent allocation, the State Water Contract provides Mojave 89.8 TAF of water.

Rationale for Expected Supply

Implementation Status

Presently, Mojave is not accepting additional water from Metropolitan. By the end of 2025, Metropolitan had approximately 19 TAF remaining in storage.

Written Contracts or Other Proof

2003 Mojave Water Agency and Metropolitan Boards of Directors Approval. These actions approved the Mojave Water Agency Groundwater Recharge and Exchange Demonstration Project.

2003 Agreement for a Demonstration Water Exchange Program. Provided for a demonstration water exchange between Metropolitan and the Mojave Water Agency for the immediate benefit of both agencies and for the purpose of determining what mutual benefits can result from increased coordinated management of water and facilities. Provides for Metropolitan to deliver up to 75,000 AF for an exchange through December 2004 and the return of water to Metropolitan by December 2014.

2005 Mojave Water Agency and Metropolitan Boards of Directors Approval. These actions approved a one-year extension of the period for Metropolitan to deliver up to the maximum amount of 75,000 AF for an exchange and a one-year extension of the return of water supply to Metropolitan.

2005 First Amendment to the Agreement for a Demonstration Water Exchange Program. Provides for a one-year extension of the period for Metropolitan to deliver up to the maximum amount of 75,000 AF for an exchange and a one-year extension of the return of water supply to Metropolitan.

2011 Mojave Water Agency and Metropolitan Boards of Directors Approval. These actions approved an amendment to the Agreement for a Demonstration Water Exchange Program to provide for a longer term Water Storage Program for Metropolitan to store up to an additional 390,000 acre-feet of SWP supplies through 2035.

2011 Amended Agreement for a Water Storage Program. Establishes the Water Storage Program under which Metropolitan to store up to an additional 390,000 acre-feet of SWP supplies through 2035 for subsequent return by Mojave Water Agency.

Financing

Metropolitan O&M budget includes payments to deliver Metropolitan's SWP supplies to Mojave Water Agency and the recovery on that water by exchange with Mojave Water Agency's SWP supplies.

Federal, State, and Local Permits/Approvals

The Mojave Water Agency, as the Lead Agency, adopted a Final Environmental Impact Report on January 26, 2006, for the Mojave Water Agency Water Supply Reliability and Groundwater Replenishment Program (SCH#2005041103), adopted a mitigation monitoring and reporting program, and filed a Notice of Determination with the State Clearinghouse on January 31, 2006. Metropolitan's Board certified the CEQA documents as a Responsible Agency on July 12, 2011.

On September 8, 2011, Metropolitan and Mojave Water Agency entered into a Point of Delivery Agreement with DWR providing for the delivery of Metropolitan's SWP supplies to Mojave Water Agency and the return to Metropolitan through an exchange of Mojave's SWP supplies.

N. Yuba Accord Dry Year Purchase Program

Source of Supply

As part of a comprehensive settlement of a State Water Resources Control Board (SWRCB) proceeding in which the Yuba County Water Agency (YCWA) is required to increase Yuba River fishery flows, referred to as the "Yuba River Accord" (Accord), YCWA reached agreement with DWR and USBR to sell a portion of the water it would be required to release, plus additional water made available by reoperation of YCWA's storage reservoirs and groundwater substitution. DWR entered into a purchase agreement with YCWA under which one-half of the water available for purchase would be available to SWP contractors that elected to participate in the purchase program. DWR and Metropolitan entered into a separate agreement which provides Metropolitan access to its proportional share of supplies that DWR obtains under its purchase agreement with YCWA. Both the

DWR-YCWA agreement and the DWR-Metropolitan agreement expired on December 31, 2025. However, both agreements were amended and extended through December 31, 2050.

Under this amended 25-year program, YCWA can sell DWR surface supplies and/or groundwater substitution supplies. Surface supplies range from $75 to $525 per AF depending on the water year type. Every five years, DWR and YCWA will renegotiate the price of the surface supplies. Alternatively, the price of groundwater substitution supplies is negotiated annually.

Expected Supply Capability

Metropolitan's share of the water made available under the Yuba Accord Dry Year Purchase Program is approximately 25 percent. Should other participating contractors decline to purchase their respective shares, that water is allocated to the remaining interested participating contractors. Metropolitan's likely share of assured YCWA transfer water would be at least 13,750 AF in dry years and up to 35,000 AF or more in other years. These volumes are as provided by YCWA north-of-the-Delta and are subject to conveyance losses through the Delta to the Banks Pumping Plant (approximately 20 to 35 percent).

Rationale for Expected Supply

Historical Record

Actual volumes purchased by Metropolitan since program inception were as follows:

Year	Purchased Volume (AF)
2008	26,430
2009	42,915
2010	67,068
2011	0
2012	0
2013	14,548
2014	10,962
2015	8,192
2016	0
2017	0
2018	21,131
2019	0
2020	8,135
2021	33,518
2022	20,048
2023	0
2024	0
2025	0

Written Contracts or Other Proof

DWR-YCWA Purchase Agreement. This December 4, 2007, agreement provides the annual determination of the amount of water to be made available by YCWA and purchased by DWR. The agreement also specifies the costs of various categories of water to be made available under a variety of hydrologic conditions.

Amended DWR-YCWA Purchase Agreement. This March 5, 2026, amendment revised the amount of water to be made available by YCWA for purchase by DWR, established new prices for surface water transfer supplies between 2026 and 2030, and extended the agreement out through December 31, 2050.

DWR-Metropolitan Participation Agreement. This December 21, 2007, agreement provides Metropolitan's election to purchase water made available by YCWA to DWR and the scheduling delivery of the purchased water. The agreement provides for mechanisms for Metropolitan payments to DWR that are due to YCWA under the DWR-YCWA Purchase Agreement.

Amended DWR-Metropolitan Participation Agreement. This December 5, 2014, amendment established prices for surface water transfer supplies between 2016 and 2020 and clarifies YCWA's rights to sell to third parties.

Amended DWR-Metropolitan Participation Agreement. The amendment, executed in September 2020, established new prices for surface water transfer supplies between 2020 and 2025.

Amended DWR-Metropolitan Participation Agreement. The March 5, 2026, amendment established new prices for surface water transfer supplies between 2026 and 2030 and extended the agreement out through December 31, 2050.

Financing

Funds for purchases of water from the Yuba Accord Dry Year Purchase Program are included in Metropolitan's O&M budget (referenced above).

Federal, State, and Local Permits/Approvals

SWRCB Order WR 2008-0014. Approval of YCWA's petition to modify revised Water Right Decision 1644 related to Water Right Permits 15026, 15027, and 15030 (Applications 5632, 15204, and 15574), and petition for long-term transfer of up to 200,000 AF of water per year from YCWA to the DWR and the USBR under Permit 15026 (Application 5632) - Lower Yuba River in Yuba County. On April 4, 2024, YCWA filed a petition with the SWRCB to enable a 25-year extension of the Yuba Accord Water Transfer Program. On January 21, 2026, the SWRCB adopted an order (WR 2026-0001) extending its approval of Long-Term Transfers for the Lower Yuba River Accord through December 31, 2050.

A.3.3 In-Region Storage and Supplies

A. Surface Storage

Source of Supply

Surface storage is a critical component of Southern California's water resource strategy. Given the region's highly variable weather and hydrology, surface reservoirs play a vital role in regulating fluctuations and mitigating potential supply shortages. Surface reservoirs enable the capture and storage of water during normal and wet years for use during dry periods, when imported supplies may be limited. Since the early twentieth century, DWR and Metropolitan have developed a network of surface reservoirs to address emergency, drought, seasonal, and regulatory needs. These reservoirs include Pyramid Lake, Castaic Lake, Elderberry Forebay, Silverwood Lake, Lake Perris, Lake Skinner, Lake Mathews, Live Oak Reservoir, Garvey Reservoir, and Diamond Valley Lake (DVL).

Metropolitan's Live Oak and Garvey Reservoirs serve exclusively as regulating facilities and have a combined capacity of approximately 4,100 AF. The remaining reservoirs are primarily used to meet emergency, drought, and seasonal demands, with a total gross storage capacity of 1,760,200 AF. However, not all of this capacity is available to Metropolitan; accounting for dead storage and volumes allocated to other entities, Metropolitan's effective storage capacity is approximately 1,665,200 AF.

Expected Supply Capability

Surface storage reservoirs are an important tool that allows Metropolitan to meet the water needs of its service area. As discussed in the EIR for the Eastside Reservoir Project, later renamed to Diamond Valley Lake (DVL), dated October 1991 and Metropolitan's IRP, the allocation of available surface storage can be divided into two primary components: emergency and drought/seasonal. As specified by Metropolitan's Board of Directors in the Final EIR for DVL, "Metropolitan shall maintain sufficient water reserves within its service area to supplement local production during an emergency or severe water shortage." With DVL in operation, Metropolitan can re-operate the surface reservoirs and meet the Board's stated objectives.

Emergency Storage Objective

Metropolitan established its original criteria for determining emergency storage requirements in the October 1991 Final Environmental Impact Report for the Eastside Reservoir, which is now named Diamond Valley Lake. These criteria were again discussed in the 1996 IRP. Metropolitan's Board approved both of these documents. Emergency storage requirements are based on the potential of a major earthquake that would damage all supply aqueducts isolating Southern California from its imported water sources. In 2019, Metropolitan and its member agencies completed a process to update the regional planning estimate of Metropolitan's Emergency Storage Objective. This emergency storage represents the amount of water that Metropolitan would store for the region in preparation for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California, including: the Colorado River Aqueduct, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct. The emergency storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods

when the imported water aqueducts may be out of service. The Emergency Storage Objective considers a six- and twelve-month outage period for the imported supply aqueducts incorporating latest seismic information and operational flexibility of Metropolitan's system, a retail water demand cutback ranging from 25 to 35 percent considering the level of conservation that the region achieved during the recent drought, and an aggregated loss of 10 to 20 percent of local supplies accounting for factors that could affect local production during emergency conditions. Under this update, Metropolitan's Emergency Storage Objective was set to 750 TAF, as this level of storage would prevent severe water shortages to the region given new information on expected recovery durations. The emergency storage volume represents a planning estimate for the amount of water that Metropolitan would store for the region in preparation for a catastrophic earthquake or other disaster. It is not intended to set a basis or a policy for allocating or apportioning storage for any individual member agency. A detailed description of Metropolitan's Emergency Storage Objective is included in Appendix 7.

The storage reserved in system reservoirs for emergency purposes is shown in Table A.3-2.

Storage Requirements for Dry-Year Supply and Seasonal Needs

Storage capacity in system reservoirs, including DVL, is also earmarked for dry-year supply and system regulation purposes. Dry-year supply storage within Metropolitan's service area is required to meet the additional water demands that occur during single-year and extended droughts. As specified in the Final EIR for DVL, this storage requirement is defined as the difference between average-year demand and above-average demand during dry years. In addition to dry-year storage, seasonal storage is required to meet seasonal peak demands, which are defined as the difference between average winter demands and average summer demands. The dry-year supply and seasonal storage also provide sufficient reserves to permit approximately five percent downtime for rehabilitation, repair, and maintenance of raw water transmission facilities.

Table A.3-2
Surface Storage Utilization
(acre-feet per year)

Forecast Year	2030	2035	2040	2045	2050
MWD Dry-Year/Seasonal Surface Storage					
DVL, Mathews, Skinner	663,100	663,100	663,100	663,100	663,100
Flexible Storage in Castaic & Perris	218,900	218,900	218,900	218,900	218,900
Subtotal of Dry-Year/Seasonal Storage	***882,000***	***882,000***	***882,000***	***882,000***	***882,000***
MWD Emergency Storage					
DVL, Mathews, Skinner	369,000	369,000	369,000	369,000	369,000
Emergency Storage in DWR Reservoirs	381,000	381,000	381,000	381,000	381,000
Subtotal of Emergency Storage	***750,000***	***750,000***	***750,000***	***750,000***	***750,000***
Total MWD Surface Storage	**1,632,000**	**1,632,000**	**1,632,000**	**1,632,000**	**1,632,000**

Historical Record

Metropolitan has a contract with the DWR that allows use of its terminal reservoirs, such as Castaic Lake on the West Branch and Lake Perris on the East Branch of the California Aqueduct (see Appendix 3.3.B for a discussion of Metropolitan's contractual rights to storage in these DWR reservoirs). In addition, Metropolitan owns and operates surface reservoirs such as Lake Skinner, Lake Mathews, and DVL to enhance water supply reliability for its member agencies.

Written Contracts or Other Proof of Usage

The surface reservoirs used by Metropolitan are available either by contract (in the case of the DWR terminal reservoirs) or by construction of its own facilities. The following historical record is provided:

November 1960 Contract between the State of California Department of Water Resources and the Metropolitan Water District of Southern California for a Water Supply. This Contract and its numerous amendments describe Metropolitan's legal access to and obligations for the operation of the SWP for the benefit of its Contractors. Metropolitan has an entitlement to 1,911,500 AF of water each year subject to availability. The terms of this Contract describe Metropolitan's rights to and obligations for the terminal surface reservoirs for water supply purposes.

November 1974 Memorandum of Understanding and Agreement on Operation of Lake Skinner. This MOU and the January 2005 Amendment, signed by Metropolitan and other affected parties, govern Metropolitan's operations of Lake Skinner in Riverside County. The DWR Division of Safety and Dams also reviews monitoring data on the safety of the dam annually.

November 1994 Memorandum of Understanding on Operation of Domenigoni Valley Reservoir (now known as Diamond Valley Lake). This MOU, signed by Metropolitan and other affected parties, governs Metropolitan's operations of DVL in Riverside County. The DWR Division of Safety and Dams also reviews monitoring data on the safety of the dam annually.

Elderberry Forebay Contract for Conditions for Use. Conditions for use of storage are described in the contract between the DWR, State of California, and the Department of Water and Power, City of Los Angeles, for Cooperative Development, West Branch, California Aqueduct; Amendment No. 1, July 3, 1969; and Amendment No. 4, June 27, 1985.

June 2002 Division of Safety of Dams Certificate of Approval. The DWR, Division of Safety of Dams issued the Certificate of Approval for operation of DVL in early 2000, with three conditions. These conditions were: (1) Satisfactory operation of the butterfly valves and emergency gate in the inlet/outlet tower, (2) completion of the Tank Saddle Cutoff remediation, and (3) completion of the Signal Spillway. Metropolitan completed these conditions in 2001, and DVL is currently operational in accordance with the Certificate of Approval.

October 1991 Final EIR for the Eastside Reservoir Project (DVL). The EIR established criteria for integrating the operations of Metropolitan's reservoirs and DWR's southern reservoirs for emergency purposes. These criteria also provided that Metropolitan

reservoirs could be expected to withdraw all drought storage water within a two-year period.

B. Flexible Storage Use of Castaic Lake and Lake Perris

Source of Storage

Metropolitan's flexible storage accounts in Castaic Lake and Lake Perris, which are SWP reservoirs, are 153,940 AF and 65,000 AF, respectively. These accounts provide Metropolitan with a dry-year supply that is independent of the Table A allocation. Metropolitan can withdraw water from these reservoirs in addition to its allocated supply in any year on an as-needed basis. Withdrawn water must be replaced from supplies available to Metropolitan within five years of each withdrawal. This flexible storage is available in Castaic Lake not just to Metropolitan, but also to Ventura County Flood Control and Water Conservation District, and to Santa Clarita Valley Water Agency. It is available in Lake Perris to Metropolitan only.

Expected Supply Capability

The dry-year supply available to Metropolitan from the flexible storage use of Castaic Lake and Lake Perris totals 218,940 AF, made up of 153,940 AF in Castaic Lake and 65,000 AF in Lake Perris. Table A.3-3 shows the use of this available supply in accordance with Metropolitan's operating criteria.

Table A.3-3
Estimated Water Supplies Available for Metropolitan's Use
Under the Flexible Storage Use of Castaic Lake and Lake Perris[1]
(acre-feet per year)

Forecast Year	Five Year Drought (1988-1992)	Single Dry Year (1977)
2030	39,000	195,000
2035	38,000	192,000
2040	37,000	185,000
2045	36,000	181,000
2050	43,000	213,000

1. Source: Metropolitan's operating criteria.

Rationale for Expected Supply

Implementation Status

Express provisions related to flexible storage have been incorporated in Metropolitan's SWP contract since 1995. The operating options have been available for use since that time and will continue to be in effect as a part of the SWP contracts.

Historical Record

Metropolitan has exercised the flexible storage provision on numerous occasions and withdrew the full contract amount by the end of calendar year 2022. The full amount was replaced in calendar year 2023. Its use is based on existing contract provisions.

Metropolitan's SWP Contract. Metropolitan's SWP contract was amended in 1995 to include Article 54, "Usage of Lakes Castaic and Perris." This article provides flexible storage to contractors participating in repayment of the capital costs of Castaic Lake and Lake Perris. Each contractor shall be permitted to withdraw up to a Maximum Allocation from Castaic Lake and Lake Perris. These contractors may withdraw a collective Maximum Allocation up to 160 TAF in Castaic Lake and 65 TAF in Lake Perris, which shall be apportioned among them pursuant to the respective proportionate use factors, as shown in Table A.3-4 below.

Financing

The cost associated with the withdrawal and replacement of water in the flexible storage is included in Metropolitan's annual payments under the State Water Contract.

Federal, State, and Local Permits/Approvals

The flexible storage provision became effective in 1995. DWR has the approval authority to affect changes in the operations and usage of existing SWP facilities, including Castaic Lake and Lake Perris.

Table A.3-4
Flexible Storage Allocations

Participating Contractor	Proportionate Use Factor	Maximum Flexible Storage Allocation (AF)
Castaic Lake		
Metropolitan	.96212388	153,940
Ventura County Flood Control and Water Conservation District	.00860328	1,376
Santa Clarita Valley Water Agency	.02927284	4,684
Total Castaic Lake	1.00000000	160,000
Lake Perris[1]	1.00000000	65,000
Metropolitan		

1. The 2003 Exchange Agreement among Metropolitan, CVWD, and DWA, among other things, transferred to CVWD and DWA a portion of Metropolitan's capacity in the California Aqueduct and the East Branch including Lake Perris. However, Metropolitan's rights to the full 65,000 AF of Lake Perris flexible storage account was retained by Metropolitan.

C. Metropolitan Surface Reservoirs

Source of Supply

Storage capacity in Metropolitan reservoirs, including Lake Skinner, Lake Mathews, Live Oak Reservoir, Garvey Reservoir, and DVL, is earmarked to meet emergency, dry-year/seasonal, and system regulation needs, as these have been defined above.

Expected Supply Capability

The total available storage capacity for Metropolitan reservoirs (Metropolitan-owned and portion of DWR terminal reservoirs) is 1.632 MAF. As discussed earlier, approximately 750,000 AF has been set aside to meet the emergency storage objective of

the service area. After accounting for emergency storage, the surface storage available in Metropolitan-owned reservoirs to meet dry-year/seasonal requirements is presented in Table A.3-5.

Rationale for Expected Supply

Program Facilities

Major facilities for Lake Mathews include an earthen dam to impound water and outlet tower. Major facilities for Lake Skinner include an earthen dam to impound water, an outlet tower, an inlet from the San Diego Canal to deliver water into the reservoir, and a water treatment filtration facility. Major facilities at DVL include three earthen dams to impound water, an inlet/outlet tower, a secondary inlet from the Inland Feeder, a large pumping station to deliver water into the reservoir, and power generating facilities.

Historical Record

DVL has been operational for over 25 years. Lake Mathews and Lake Skinner have been in service since the 1940s and 1970s, respectively.

November 1974 Memorandum of Understanding and Agreement on Operation of Lake Skinner. This MOU and the January 2005 Amendment, signed by Metropolitan and other affected parties, govern Metropolitan's operations of Lake Skinner in Riverside County. The DWR Division of Safety and Dams also reviews monitoring data on the safety of the dam annually.

October 1991 Final EIR for the Eastside Reservoir Project (DVL). The EIR established criteria for integrating the operations of Metropolitan's reservoirs and DWR's southern reservoirs for emergency purposes. These criteria also provided that Metropolitan reservoirs could be expected to withdraw all drought storage water within a two-year period.

November 1994 Memorandum of Understanding on Operation of Domenigoni Valley Reservoir (now known as Diamond Valley Lake). This MOU, signed by Metropolitan and other affected parties, governs Metropolitan's operations of DVL in Riverside County. The DWR Division of Safety and Dams also reviews monitoring data on the safety of the dam annually.

June 2002 Division of Safety of Dams Certificate of Approval. The DWR Division of Safety of Dams issued the Certificate of Approval for operation of DVL in early 2000, with three conditions. These conditions were: (1) satisfactory operation of the butterfly valves and emergency gate in the inlet/outlet tower, (2) completion of the Tank Saddle Cutoff remediation, and (3) completion of the Signal Spillway. Metropolitan completed these conditions in 2001, and DVL is currently operational in accordance with the Certificate of Approval.

Table A.3-5
Estimated Supplies Available from Metropolitan's Surface Storage Program Capabilities
(acre-feet per year)

Forecast Year	Five Year Drought (1988-1992)	Single Dry Year (1977)
2030	157,000	786,000
2035	154,000	774,000
2040	149,000	744,000
2045	146,000	730,000
2050	172,000	857,000

Financing

The capital cost of DVL, Lake Mathews, and Lake Skinner was financed by a combination of revenue bonds and operating revenues. Annual operating costs, including maintenance and pumping, are included in Metropolitan's annual O&M budget (referenced above).

Federal, State, and Local Permits/Approvals

All necessary permits, approvals, and exemptions have been obtained.

D. Groundwater Conjunctive Use Programs

Source of Supply

Metropolitan's IRP established the strategy to store imported water that is most available during wet years in surface reservoirs or groundwater aquifers for later use during droughts and emergencies. In this way, Metropolitan can reduce its reliance on direct deliveries from the SWP and the Colorado River during dry years when competing demands by other users and risks to the watershed ecosystems are greatest. Metropolitan has implemented a conjunctive use program for imported water storage in groundwater basins within the service area based upon policy principles adopted in 2000.

In 2007, Metropolitan published the Groundwater Assessment Study which estimated 3.2 MAF of available storage space in groundwater basins. Due to drought and the subsequent decline in water levels, it is estimated that storage in the groundwater basins has declined about 700 TAF from 2000 to 2019.

Rationale for Expected Supply

Implementation Status

The status of implementation for the groundwater conjunctive use programs has been described above.

Historical Record

In 2000, Metropolitan entered an agreement with DWR to administer $45 million of Proposition 13 state bond funds for Metropolitan's Southern California Water Supply Reliability Projects Program. Metropolitan paired the $45 million of state funds with

$35 million of Metropolitan capital funds to develop nine groundwater storage programs in partnership with member and retail agencies and groundwater basin managers. These nine contractual storage programs have an initial 25-year term and provide for storage of up to 212 TAF and dry-year yield of up to 70 TAF. The active programs are summarized in Table A.3-6. Since inception, the conjunctive use program has been exercised to store water in groundwater basins during wet periods and relied upon to extract that water during dry periods. For example, during the drought period from 2012 to 2016 and from 2020 to 2022, the conjunctive use program provided approximately 64 TAF and 48 TAF of dry year supply to help Metropolitan meet regional demands, respectively. As of January 2025, the conjunctive use storage balance is 77 TAF. In April 2025, Metropolitan's Board elected to terminate six inactive conjunctive use program agreements in June 2025; The terminated programs include Compton, Foothill Area, Live Oak Basin, Long Beach, Long Beach Expansion into Lakewood, and Orange County. The terminated programs had been inactive at the time. Over time, Metropolitan has developed alternative approaches and programs for coordinated groundwater storage management that can continue to provide regional benefits that have previously come from these inactive CUP programs.

Table A.3-6
Metropolitan's In-Region Groundwater Storage Programs[1]

Program	Metropolitan Agreement Partners	Program Term	Max Storage (AF)	Dry-Year Yield (AF/Yr)
Chino Basin Conjunctive Use Program	IEUA TVMWD Chino Basin Watermaster	June 2003-2028	100,000	33,000
Upper Claremont Heights Groundwater Storage Program	TVMWD	Sept. 2005-2030	3,000	1,000
Elsinore Groundwater Storage Program	Western MWD Elsinore Valley MWD	May 2008-2033	12,000	4,000
Total			**115,000**	**38,000**

1. Active In-Region Groundwater Storage Programs as of July 1, 2025

Metropolitan has also implemented a Cyclic Program to help capture additional imported supplies that would otherwise be lost to the region, when available storage capacity is limited. Under the Cyclic Program, Metropolitan delivers imported water supplies to the member agencies for storage in their local groundwater basin or surface water reservoir in advance of the demand for the water for a future use. The member agency purchases the water based on a mutually agreed upon schedule but has full discretion on the use of the stored water. The Cyclic Program creates additional flexibility for managing Metropolitan's water supplies.

Metropolitan has ten-year cyclic agreements with the City of Burbank, the City of Pasadena, the City of Long Beach, Calleguas Municipal Water District, Eastern Municipal

Water District, Municipal Water District of Orange County, Foothill Municipal Water District, Las Virgenes Municipal Water District, San Diego County Water Authority, and Western Municipal Water District. These agreements commenced between 2017 and 2023. In addition to these agreements, Metropolitan has existing agreements with two other member agencies. The Cyclic Storage Agreement with Upper San Gabriel Valley MWD allows pre-delivery and storage of up to 200 TAF of imported water. The agreement was originally signed in 1975 for a term of five years and was extended in five-year increments until 2022, when the agreement was replaced with a new ten-year agreement. The current agreement was amended effective May 2024 to extend the termination date to May 2035. The Cyclic Storage Agreement with Three Valleys MWD allows for pre-delivery and storage of up to 50 TAF. An agreement was originally signed in 1991 for a term of five years and was extended in five-year increments until June 2020, when the agreement was replaced by a new ten-year agreement. The current agreement was amended effective June 2024 to extend the termination date to June 2034. Both agreements are expected to be renewed repeatedly in the future.

Written Contracts or Other Proof

Metropolitan's dry-year supply from the groundwater conjunctive use programs is based on Metropolitan's Board actions and agreements.

Proposition 13 Groundwater Conjunctive Use Programs.

Metropolitan published the Groundwater Assessment Study Report in 2007 in collaboration with its member agencies and groundwater basin managers to document existing use and development of groundwater resources in Metropolitan's service area and to estimate additional groundwater basin storage potential.

Principles for groundwater storage adopted by the Metropolitan Board in January 2000.

Resolution for Proposition 13 Funds adopted by the Metropolitan Board in October 2000.

Agreement executed with the DWR for Interim Water Supply Construction Grant Commitment Safe Drinking Water, Clean Water, Watershed Protection and Flood Protection (Proposition 13, Chapter 9, Article 4) providing for Metropolitan to administer $45 million in state Proposition 13 grant funds for groundwater reliability programs; October 2000.

Agreement executed for Long Beach Conjunctive Use Project, July 2002, amended in July 2003, October 2005, and November 2008. Agreement terminated June 2025.

Agreement executed for Live Oak Conjunctive Use Project, October 2002. Agreement terminated June 2025.

Agreement executed for Foothill Area Groundwater Storage Project, February 2003, amended in August 2006, April 2008, and February 2009. Agreement terminated June 2025.

Agreement executed for Chino Basin Conjunctive Use Programs, June 2003, amended in May 2004, August 2004, August 2005, May 2008, March 2009, September 2009, July 2010, and January 2015.

Agreement executed for Orange County Groundwater Storage Program, June 2003,

amended in July 2004, December 2005, and July 2008. Agreement terminated June 2025.

Agreement executed for Compton Conjunctive Use Program, February 2005. Agreement terminated June 2025.

Agreement executed for Long Beach Conjunctive Use Project — Expansion in Lakewood, July 2005, amended in April 2006, August 2007, November 2008, and February 2010. Agreement terminated June 2025.

Agreement executed for Upper Claremont Basin Groundwater Storage Program, September 2005, amended in April 2008.

Agreement executed for Elsinore Basin Conjunctive Use Program, December 2006, amended in May 2008.

All of these programs have an initial 25-year term, with provision for renewal or extension after that period.

Financing

Financing has been supplied from multiple sources as discussed below:

Financing from Proposition 13 and Additional Groundwater Storage Programs.

Proposition 13 funds ($45 million) were allocated to Metropolitan by the state in May 2000 for the development of local groundwater storage projects.

Metropolitan has executed groundwater storage funding agreements for nine storage programs, expended $45 million of the Proposition 13 funds, and appropriated over $35 million of Metropolitan capital funds for the storage programs in the Orange County and Chino groundwater basins. All nine storage programs have completed facilities. There are currently three storage programs with nearly 115,000 acre-feet of storage capacity..

Table A.3-6 provides details on the active groundwater storage programs.

Federal, State, and Local Permits/Approvals

Long Beach Conjunctive-use Storage Project. Environmental documentation for the Long Beach Conjunctive-use Storage Project was certified by the City of Long Beach in August 2001.

Live Oak Basin Conjunctive-use Storage Project. Environmental documentation for the Live Oak Basin Conjunctive-use Storage Project was certified by Three Valleys MWD in January 2002.

Foothill Area Groundwater Storage Project. Environmental documentation for the Foothill Area Groundwater Storage Project was certified by Foothill Municipal Water District in January 2003.

Chino Basin Programs Groundwater Storage Project. Environmental documentation for the Chino Basin Programs Groundwater Storage Project was certified by Inland Empire Utility Agency in December 2002.

Long Beach Conjunctive Use Storage Project — Expansion in Lakewood. Environmental documentation for the project was certified by the City of Lakewood in May 2005.

City of Compton Conjunctive Use Program. Environmental documentation for the project was certified by the City of Compton in December 2004.

Orange County Groundwater Conjunctive Use Program. Environmental documentation for the project was certified by Orange County Water District in March 1999 and in July 2002.

Upper Claremont Basin Groundwater Storage Program. Environmental documentation for the project was certified by Three Valleys MWD in July 2005.

Elsinore Basin Conjunctive Use Program. Environmental documentation for the project was certified by Elsinore Valley MWD in February 2004.

E. Potential Program

Pure Water Southern California

Pure Water Southern California, a partnership with the Los Angeles County Sanitation Districts, is a potential project that would purify wastewater from the A.K. Warren Water Resource Facility (Warren Facility) to produce high quality water that could be used again. Pure Water would produce up to 150 MGD of purified water from the Warren Facility in Carson for groundwater replenishment, industrial use, and raw water augmentation at Weymouth and Diemer water treatment plants. As proposed, the project at full buildout includes the construction of an Advanced Water Purification Facility, over 50 miles of large diameter pipeline from Carson to La Verne, six pump stations, nine service connections, and various recharge facilities. The agencies have been working together since 2010 on the program. As a first step toward full implementation, Metropolitan and the Sanitation Districts cooperated to complete the Advanced Purification Center in 2019, now named the Grace F. Napolitano Pure Water Southern California Innovation Center (Napolitano Innovation Center). The Napolitano Innovation Center is a 0.5 million gallon per day demonstration facility that has generated information needed for the potential future construction of a full-scale recycled water facility. It uses a unique application of membrane bioreactors designed to significantly increase efficiency in water recycling. Scientists and engineers have tested the process, utilizing full-scale treatment modules, to ensure the resulting purified water meets the highest water quality standards for more than five years. Once approved by regulators, this innovative process could be used throughout California and even applied around the globe.

On November 10, 2020, Metropolitan's Board voted to begin environmental planning work on Pure Water Southern California. The Notice of Preparation was published in September 2022 with scoping meetings held in October 2022. The draft Environmental Impact Report (EIR) was released on May 14, 2025. The final EIR was certified by the Board in February 2026. Metropolitan's Board will consider approval of this program in 2026. At full scale, the program would be one of the largest water reuse efforts of its kind in the world.

Although it is described in this appendix as a project with significant potential benefit for Metropolitan's future supply reliability, Pure Water Southern California is not included in Metropolitan's 2025 UWMP supply projections.

Table A.3-7
Colorado River Aqueduct
Program Capabilities
Calendar Year 2030
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
Basic Apportionment – Priority 4	550,000	550,000	550,000
DCP Contribution[1]	(97,500)	(75,000)	(75,000)
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment (Surplus)	0	0	0
PVID Land Management, Crop Rotation, and Water Supply Program	95,000	120,000	120,000
Lower Colorado Water Supply Project	9,000	9,000	9,000
Lake Mead ICS Storage Program	285,000	400,000	400,000
Binational ICS	0	0	0
Forbearance for Present Perfected Rights	(2,000)	(2,000)	(2,000)
CVWD SWP/QSA Transfer Agreement	(12,800)	(12,800)	(12,800)
DWCV SWP Table A Obligation	(56,000)	(10,000)	(148,000)
DWCV Advance Delivery Account	56,000	10,000	148,000
Quechan Seasonal Fallowing Program	2,000	2,000	2,000
Quechan Diversion Forbearance Program	6,500	6,500	6,500
IID Payback	(20,000)	(20,000)	(20,000)
SNWA Agreement Payback	(4,000)	(22,000)	(22,000)
Subtotal of Current Programs	***896,200***	***1,040,700***	***1,040,700***
Programs Under Development			
Additional Transfer Programs	0	0	0
Subtotal of Proposed Programs	0	0	0
Additional CRA Exchange Supplies			
Exchange with SDCWA/IID Transfer	200,000	200,000	200,000
Coachella & All-American Canal Lining			
To SDCWA	78,000	78,000	78,000
To United States	16,000	16,000	16,000
Subtotal of Additional Colorado River Supplies	***294,000***	***294,000***	***294,000***
Maximum CRA Supply Capability[2]	**1,190,200**	**1,334,700**	**1,334,700**
Less CRA Capacity Constraint (amount above 1.25 MAF)	-	*(84,700)*	*(84,700)*
Maximum Expected CRA Deliveries[3]	**1,190,200**	**1,250,000**	**1,250,000**

Notes:
1. DCP is extended through the forecast as a proxy for anticipated reductions borne out of the Post-2026 Colorado River Negotiations. When new regulations are finalized, these numbers will change.
2. Total amount of supplies available without taking into consideration CRA capacity constraint.
3. The Colorado River Aqueduct delivery capacity is 1.25 MAF annually.

Table A.3-7
Colorado River Aqueduct
Program Capabilities
Calendar Year 2035
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2017)
Current Programs			
Basic Apportionment – Priority 4	550,000	550,000	550,000
DCP Contribution[1]	(72,500)	(75,000)	(75,000)
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment (Surplus)	0	0	0
PVID Land Management, Crop Rotation, and Water Supply Program	120,000	120,000	120,000
Lower Colorado Water Supply Project	9,000	9,000	9,000
Lake Mead ICS Storage Program	281,000	400,000	400,000
Binational ICS	0	0	0
Forbearance for Present Perfected Rights	(2,000)	(2,000)	(2,000)
CVWD SWP/QSA Transfer Agreement	(12,800)	(12,800)	(12,800)
DWCV SWP Table A Obligation	(52,000)	(8,000)	(144,000)
DWCV Advance Delivery Account	52,000	8,000	144,000
Quechan Seasonal Fallowing Program	2,000	2,000	2,000
Quechan Diversion Forbearance Program	10,000	10,000	10,000
IID Payback	0	0	0
SNWA Agreement Payback	(22,000)	(22,000)	(22,000)
Subtotal of Current Programs	***947,700***	***1,064,200***	***1,064,200***
Programs Under Development			
Additional Transfer Programs	0	0	0
Subtotal of Proposed Programs	***0***	***0***	***0***
Additional CRA Exchange Supplies			
Exchange with SDCWA/IID Transfer	200,000	200,000	200,000
Coachella & All-American Canal Lining			
To SDCWA	78,000	78,000	78,000
To United States	16,000	16,000	16,000
Subtotal of Additional Colorado River Supplies	***294,000***	***294,000***	***294,000***
Maximum CRA Supply Capability[2]	**1,241,700**	**1,358,200**	**1,358,200**
Less CRA Capacity Constraint (amount above 1.25 MAF)	-	*(108,200)*	*(108,200)*
Maximum Expected CRA Deliveries[3]	**1,241,700**	**1,250,000**	**1,250,000**

Notes:
1. DCP is extended through the forecast as a proxy for anticipated reductions borne out of the Post-2026 Colorado River Negotiations. When new regulations are finalized, these numbers will change.
2. Total amount of supplies available without taking into consideration CRA capacity constraint.
3. The Colorado River Aqueduct delivery capacity is 1.25 MAF annually.

Table A.3-7
Colorado River Aqueduct
Program Capabilities
Calendar Year 2040
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2017)
Current Programs			
Basic Apportionment – Priority 4	550,000	550,000	550,000
DCP contribution[1]	(77,500)	(75,000)	(75,000)
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment (Surplus)	0	0	0
PVID Land Management, Crop Rotation, and Water Supply Program	120,000	120,000	120,000
Lower Colorado Water Supply Project	9,000	9,000	9,000
Lake Mead ICS Storage Program	270,000	400,000	400,000
Binational ICS	0	0	0
Forbearance for Present Perfected Rights	(2,000)	(2,000)	(2,000)
CVWD SWP/QSA Transfer Agreement	(35,000)	(35,000)	(35,000)
DWCV SWP Table A Obligation	(48,000)	(6,000)	(140,000)
DWCV Advance Delivery Account	48,000	6,000	140,000
Quechan Seasonal Fallowing Program	2,000	2,000	2,000
Quechan Diversion Forbearance Program	10,000	10,000	10,000
IID Payback	0	0	0
SNWA Agreement Payback	(22,000)	(22,000)	(22,000)
Subtotal of Current Programs	***909,500***	***1,042,000***	***1,042,000***
Programs Under Development			
Additional Transfer Programs	0	0	0
Subtotal of Proposed Programs	***0***	***0***	***0***
Additional CRA Exchange Supplies			
Exchange with SDCWA/IID Transfer	200,000	200,000	200,000
Coachella & All-American Canal Lining			
To SDCWA	78,000	78,000	78,000
To United States	16,000	16,000	16,000
Subtotal of Additional Colorado River Supplies	***294,000***	***294,000***	***294,000***
Maximum CRA Supply Capability[2]	**1,203,500**	**1,336,000**	**1,336,000**
Less CRA Capacity Constraint (amount above 1.25 MAF)	-	*(86,000)*	*(86,000)*
Maximum Expected CRA Deliveries[3]	**1,203,500**	**1,250,000**	**1,250,000**

Notes:
1. DCP is extended through the forecast as a proxy for anticipated reductions borne out of the Post-2026 Colorado River Negotiations. When new regulations are finalized, these numbers will change.
2. Total amount of supplies available without taking into consideration CRA capacity constraint.
3. The Colorado River Aqueduct delivery capacity is 1.25 MAF annually.

Table A.3-7
Colorado River Aqueduct
Program Capabilities
Calendar Year 2045
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2017)
Current Programs			
Basic Apportionment – Priority 4	550,000	550,000	550,000
DCP Contribution[1]	(80,000)	0	(87,500)
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment (Surplus)	0	0	0
PVID Land Management, Crop Rotation, and Water Supply Program	120,000	120,000	120,000
Lower Colorado Water Supply Project	9,000	9,000	9,000
Lake Mead ICS Storage Program	265,000	400,000	400,000
Binational ICS	0	0	0
Forbearance for Present Perfected Rights	(2,000)	(2,000)	(2,000)
CVWD SWP/QSA Transfer Agreement	(35,000)	(35,000)	(35,000)
DWCV SWP Table A Obligation	(44,000)	(4,000)	(137,000)
DWCV Advance Delivery Account	44,000	4,000	137,000
Quechan Seasonal Fallowing Program	2,000	2,000	2,000
Quechan Diversion Forbearance Program	10,000	10,000	10,000
IID Payback	0	0	0
SNWA Agreement Payback	(22,000)	(22,000)	(22,000)
Subtotal of Current Programs	***902,000***	***1,117,000***	***1,029,500***
Programs Under Development			
Additional Transfer Programs	0	0	0
Subtotal of Proposed Programs	***0***	***0***	***0***
Additional CRA Exchange Supplies			
Exchange with SDCWA/IID Transfer	200,000	200,000	200,000
Coachella & All-American Canal Lining			
To SDCWA	78,000	78,000	78,000
To United States	16,000	16,000	16,000
Subtotal of Additional Colorado River Supplies	***294,000***	***294,000***	***294,000***
Maximum CRA Supply Capability[2]	**1,196,000**	**1,411,000**	**1,323,500**
Less CRA Capacity Constraint (amount above 1.25 MAF)	-	*(161,000)*	*(73,500)*
Maximum Expected CRA Deliveries[3]	**1,196,000**	**1,250,000**	**1,250,000**

Notes:
1. DCP is extended through the forecast as a proxy for anticipated reductions borne out of the Post-2026 Colorado River Negotiations. When new regulations are finalized, these numbers will change.
2. Total amount of supplies available without taking into consideration CRA capacity constraint.
3. The Colorado River Aqueduct delivery capacity is 1.25 MAF annually.

Table A.3-7
Colorado River Aqueduct
Program Capabilities
Calendar Year 2050
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
Basic Apportionment – Priority 4	550,000	550,000	550,000
DCP Contribution[1]	(87,500)	0	(87,500)
IID/MWD Conservation Program	85,000	85,000	85,000
Priority 5 Apportionment (Surplus)	0	0	0
PVID Land Management, Crop Rotation, and Water Supply Program	120,000	120,000	120,000
Lower Colorado Water Supply Project	9,000	9,000	9,000
Lake Mead ICS Storage Program	311,000	400,000	400,000
Binational ICS	0	0	0
Forbearance for Present Perfected Rights	(2,000)	(2,000)	(2,000)
CVWD SWP/QSA Transfer Agreement	(35,000)	(35,000)	(35,000)
DWCV SWP Table A Obligation	(44,000)	(4,000)	(137,000)
DWCV Advance Delivery Account	44,000	4,000	137,000
Quechan Seasonal Fallowing Program	2,000	2,000	2,000
Quechan Diversion Forbearance Program	10,000	10,000	10,000
IID Payback	0	0	0
SNWA Agreement Payback	0	0	0
Subtotal of Current Programs	***962,500***	***1,139,000***	***1,051,500***
Programs Under Development			
Additional Transfer Programs	0	0	0
Subtotal of Proposed Programs	***0***	***0***	***0***
Additional CRA Exchange Supplies			
Exchange with SDCWA/IID Transfer	200,000	200,000	200,000
Coachella & All-American Canal Lining			
To SDCWA	78,000	78,000	78,000
To United States	16,000	16,000	16,000
Subtotal of Additional Colorado River Supplies	***294,000***	***294,000***	***294,000***
Maximum CRA Supply Capability[2]	**1,256,500**	**1,433,000**	**1,345,500**
Less CRA Capacity Constraint (amount above 1.25 MAF)	*(6,500)*	*(183,000)*	*(95,500)*
Maximum Expected CRA Deliveries[3]	**1,250,000**	**1,250,000**	**1,250,000**

Notes:
1. DCP is extended through the forecast as a proxy for anticipated reductions borne out of the Post-2026 Colorado River Negotiations. When new regulations are finalized, these numbers will change.
2. Total amount of supplies available without taking into consideration CRA capacity constraint.
3. The Colorado River Aqueduct delivery capacity is 1.25 MAF annually.

Table A.3-7
California Aqueduct
Program Capabilities
Calendar Year 2030
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
MWD Table A[1]	353,000	62,000	934,000
DWCV Table A	56,000	10,000	148,000
San Luis Carryover[2]	62,000	286,000	286,000
Article 21 Supplies	0	0	15,000
Yuba River Accord Purchase	11,200	14,000	7,000
Central Valley Storage and Transfers			
Semitropic Program	50,000	45,000	64,000
Arvin Edison Program[3]	59,000	75,000	75,000
Mojave Program	3,000	0	24,000
AVEK/High Desert Water Bank Program	47,000	70,000	70,000
Kern Delta Program	42,000	50,000	50,000
Transfers and Exchanges	50,000	50,000	50,000
Subtotal of Current Programs	***733,200***	***662,000***	***1,723,000***
Programs Under Development			
Subtotal of Proposed Programs	***0***	***0***	***0***
Maximum Supply Capability	**733,200**	**662,000**	**1,723,000**

Notes:
1. Includes Port Hueneme lease.
2. Includes DWCV carryover.
3. Take and put amounts limited due to water quality considerations.

Table A.3-7
California Aqueduct
Program Capabilities
Calendar Year 2035
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
MWD Table A[1]	327,000	51,000	909,000
DWCV Table A	52,000	8,000	144,000
San Luis Carryover[2]	61,000	286,000	286,000
Article 21 Supplies	0	0	15,000
Yuba River Accord Purchase	13,400	14,000	7,000
Central Valley Storage and Transfers			
Semitropic Program	50,000	45,000	64,000
Arvin Edison Program[3]	65,000	75,000	75,000
Mojave Storage Program	3,000	0	24,000
AVEK/High Desert Water Bank Program	52,000	70,000	70,000
Kern Delta Program	46,000	50,000	50,000
Transfers and Exchanges	50,000	50,000	50,000
Subtotal of Current Programs	***719,400***	***649,000***	***1,694,000***
Programs Under Development			
Subtotal of Proposed Programs	***0***	***0***	**0**
Maximum Supply Capability	**719,400**	**649,000**	**1,694,000**

Notes:
1. Includes Port Hueneme lease.
2. Includes DWCV carryover.
3. Take and put amounts limited due to water quality considerations.

Table A.3-7
California Aqueduct
Program Capabilities
Calendar Year 2040
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
MWD Table A[1]	301,000	39,000	885,000
DWCV Table A	48,000	6,000	140,000
San Luis Carryover[2]	59,000	286,000	286,000
Article 21 Supplies	0	0	16,000
Yuba River Accord Purchase	13,400	14,000	8,000
Central Valley Storage and Transfers			
Semitropic Program	50,000	45,000	64,000
Arvin Edison Program[3]	66,000	75,000	75,000
Mojave Storage Program	3,000	0	24,000
AVEK/High Desert Water Bank Program	53,000	70,000	70,000
Kern Delta Program	47,000	50,000	50,000
Transfers and Exchanges	50,000	50,000	50,000
Subtotal of Current Programs	***690,400***	***635,000***	***1,668,000***
Programs Under Development			
Subtotal of Proposed Programs	***0***	***0***	***0***
Maximum Supply Capability	**690,400**	**635,000**	**1,668,000**

Notes:
1. Includes Port Hueneme lease.
2. Includes DWCV carryover.
3. Take and put amounts limited due to water quality considerations.

Table A.3-7
California Aqueduct
Program Capabilities
Calendar Year 2045
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
MWD Table A[1]	276,000	28,000	860,000
DWCV Table A	44,000	4,000	137,000
San Luis Carryover[2]	58,000	286,000	286,000
Article 21 Supplies	0	0	17,000
Yuba River Accord Purchase	13,400	14,000	8,000
Central Valley Storage and Transfers			
Semitropic Program	50,000	45,000	64,000
Arvin Edison Program[3]	66,000	75,000	75,000
Mojave Storage Program	3,000	0	24,000
AVEK/High Desert Water Bank Program	52,000	70,000	70,000
Kern Delta Program	47,000	50,000	50,000
Transfers and Exchanges	50,000	50,000	50,000
Subtotal of Current Programs	***659,400***	***622,000***	***1,641,000***
Programs Under Development			
Subtotal of Proposed Programs	***0***	***0***	***0***
Maximum Supply Capability	**659,400**	**622,000**	**1,641,000**

Notes:
1. Includes Port Hueneme lease.
2. Includes DWCV carryover.
3. Take and put amounts limited due to water quality considerations.

Table A.3-7
California Aqueduct
Program Capabilities
Calendar Year 2050
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
MWD Table A[1]	276,000	28,000	860,000
DWCV Table A	44,000	4,000	137,000
San Luis Carryover[2]	68,000	286,000	286,000
Article 21 Supplies	0	0	17,000
Yuba River Accord Purchase	13,400	14,000	8,000
Central Valley Storage and Transfers			
Semitropic Program	39,000	45,000	64,000
Arvin Edison Program[3]	39,000	75,000	75,000
Mojave Storage Program	3,000	0	24,000
AVEK/High Desert Water Bank Program	31,000	70,000	70,000
Kern Delta Program	28,000	50,000	50,000
Transfers and Exchanges	50,000	50,000	50,000
Subtotal of Current Programs	***591,400***	***622,000***	***1,641,000***
Programs Under Development			
Subtotal of Proposed Programs	***0***	***0***	***0***
Maximum Supply Capability	**591,400**	**622,000**	**1,641,000**

Notes:
1. Includes Port Hueneme lease.
2. Includes DWCV carryover.
3. Take and put amounts limited due to water quality considerations.

Table A.3-7
In-Region Supplies and Programs
Program Capabilities
Calendar Year 2030
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
Metropolitan Surface Storage (DVL, Mathews, Skinner)	118,000	591,000	591,000
Flexible Storage in Castaic & Perris	39,000	195,000	195,000
Groundwater Storage			
Conjunctive Use	3,000	5,000	5,000
Subtotal of Current Programs	***160,000***	***791,000***	***791,000***
Programs Under Development			
Subtotal of Proposed Programs	***0***	***0***	***0***
Maximum Supply Capability	**160,000**	**791,000**	**791,000**

Table A.3-7
In-Region Supplies and Programs
Program Capabilities
Calendar Year 2035
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
Metropolitan Surface Storage (DVL, Mathews, Skinner)	116,000	582,000	582,000
Flexible Storage in Castaic & Perris	38,000	192,000	192,000
Groundwater Storage			
Conjunctive Use	0	0	0
Subtotal of Current Programs	***154,000***	***774,000***	***774,000***
Programs Under Development			
Subtotal of Proposed Programs	***0***	***0***	***0***
Maximum Supply Capability	**154,000**	**774,000**	**774,000**

Table A.3-7
In-Region Supplies and Programs
Program Capabilities
Calendar Year 2040
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
Metropolitan Surface Storage (DVL, Mathews, Skinner)	112,000	559,000	559,000
Flexible Storage in Castaic & Perris	37,000	185,000	185,000
Groundwater Storage			
Conjunctive Use	0	0	0
Subtotal of Current Programs	***149,000***	***744,000***	***744,000***
Programs Under Development			
Subtotal of Proposed Programs	***0***	***0***	***0***
Maximum Supply Capability	**149,000**	**744,000**	**744,000**

Table A.3-7
In-Region Supplies and Programs
Program Capabilities
Calendar Year 2045
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
Metropolitan Surface Storage (DVL, Mathews, Skinner)	110,000	549,000	549,000
Flexible Storage in Castaic & Perris	36,000	181,000	181,000
Groundwater Storage			
Conjunctive Use	0	0	0
Subtotal of Current Programs	***146,000***	***730,000***	***730,000***
Programs Under Development			
Subtotal of Proposed Programs	***0***	***0***	***0***
Maximum Supply Capability	**146,000**	**730,000**	**730,000**

Table A.3-7
In-Region Supplies and Programs
Program Capabilities
Calendar Year 2050
(acre-feet per year)

Hydrology	Five Year Drought (1988-1992)	Single Dry Year (1977)	Normal Year (1922-2021)
Current Programs			
Metropolitan Surface Storage (DVL, Mathews, Skinner)	129,000	644,000	644,000
Flexible Storage in Castaic & Perris	43,000	213,000	213,000
Groundwater Storage			
Conjunctive Use	0	0	0
Subtotal of Current Programs	***172,000***	***857,000***	***857,000***
Programs Under Development			
Subtotal of Proposed Programs	***0***	***0***	***0***
Maximum Supply Capability	**172,000**	**857,000**	**857,000**

Table A.3-8
Colorado River Aqueduct
Supply Characterization[1] Year 2026-2030
Repeat of 1988-1992 Hydrologies
(acre-feet per year)

Forecast Year	2026	2027	2028	2029	2030
Current Programs					
Basic Apportionment – Priority 4	550,000	550,000	550,000	550,000	550,000
DCP Contribution[2]	0	(50,000)	(75,000)	(88,000)	(75,000)
IID/MWD Conservation Program	90,000	85,000	85,000	85,000	85,000
Priority 5 Apportionment (Surplus)	0	0	0	0	0
PVID Land Management, Crop Rotation, and Water Supply Program	0	120,000	120,000	120,000	120,000
Lower Colorado Water Supply Project	9,000	9,000	9,000	9,000	9,000
Lake Mead ICS Storage Program	400,000	50,000	269,000	262,500	287,000
Binational ICS	18,000	0	0	0	0
Forbearance for Present Perfected Rights	(2,000)	(2,000)	(2,000)	(2,000)	(2,000)
CVWD SWP/QSA Transfer Agreement	(100,000)	(13,000)	(13,000)	(13,000)	(13,000)
DWCV SWP Table A Obligation	(24,000)	(196,000)	(21,000)	(23,000)	(39,000)
DWCV Advance Delivery Account	24,000	196,000	21,000	23,000	39,000
Quechan Seasonal Fallowing Program	2,000	2,000	2,000	2,000	2,000
Quechan Diversion Forbearance Program	0	6,500	6,500	6,500	6,500
SNWA Agreement Payback	0	0	0	0	(22,000)
IID Payback	(20,000)	(20,000)	(12,000)	0	0
Subtotal of Current Programs	***947,000***	***737,500***	***939,500***	***932,000***	***947,500***
Programs Under Development					
Additional transfer Programs	0	0	0	0	0
Subtotal of Proposed Programs	***0***	***0***	***0***	***0***	***0***
Additional CRA Exchange Supplies					
Exchange with SDCWA/IID Transfer	200,000	200,000	200,000	200,000	200,000
Exchange with United States	16,000	16,000	16,000	16,000	16,000
Coachella & All-American Canal Lining to SDCWA	78,000	78,000	78,000	78,000	78,000
Subtotal of Additional Colorado River Supplies	***294,000***	***294,000***	***294,000***	***294,000***	***294,000***
Maximum CRA Supply Capability[3]	**1,241,000**	**1,031,500**	**1,233,500**	**1,226,000**	**1,241,500**
Less CRA Capacity Constraint (amount above 1.25 MAF)	-	-	-	-	-
Subtotal of CR Core Supplies	*799,000*	*835,500*	*1,018,500*	*1,028,500*	*1,012,500*
Subtotal of CR Storage	*442,000*	*196,000*	*215,000*	*197,500*	*229,000*
Maximum Expected CRA Deliveries[4]	**1,241,000**	**1,031,500**	**1,233,500**	**1,226,000**	**1,241,500**

1. Supply characterization for the Drought Risk Assessment is based on core supplies as defined in WSCP Appendix 4. Flexible and storage supplies from CR, SWP, and In-Region may be exercised as supply augmentation action to any potential core supply shortfall.
2. DCP is extended through the forecast as a proxy for anticipated reductions borne out of the Post-2026 Colorado River Negotiations. When new regulations are finalized, these numbers will change.
3. Total amount of supplies available without taking into consideration CRA capacity constraint.
4. The Colorado River Aqueduct delivery capacity is 1.25 MAF annually.

Table A.3-8
California Aqueduct
Supply Characterization[1] Year 2026-2030
Repeat of 1988-1992 Hydrologies
(acre-feet per year)

Forecast Year	2026	2027	2028	2029	2030
Current Programs					
MWD Table A[2]	150,000	1,235,000	130,000	145,000	249,000
DWCV Table A	24,000	196,000	21,000	23,000	39,000
Article 21 Supplies	0	0	0	0	0
Subtotal of SWP Core Supplies	**174,000**	**1,431,000**	**151,000**	**168,000**	**288,000**
San Luis Carryover[3]	183,000	0	0	0	0
Yuba River Accord Purchase	14,000	0	14,000	14,000	14,000
Central Valley Storage and Transfers					
Semitropic Program	40,000	0	40,000	40,000	40,000
Arvin Edison Program[4]	0	0	0	0	0
Mojave Storage Program	0	0	0	0	0
AVEK/High Desert Water Bank Program	0	0	30,000	30,000	0
Kern Delta Program	33,000	0	50,000	50,000	18,000
Transfers and Exchanges	50,000	50,000	50,000	50,000	50,000
Subtotal of SWP Flexible and Storage Programs	***320,000***	***50,000***	***184,000***	***184,000***	***122,000***
Programs Under Development					
Subtotal of Proposed Programs	***0***	***0***	***0***	***0***	***0***
Maximum Supply Capability	**494,000**	**1,481,000**	**335,000**	**352,000**	**410,000**

1. Supply characterization for the Drought Risk Assessment is based on core supplies as defined in WSCP Appendix 4. Flexible and storage supplies from CR, SWP, and In-Region may be exercised as supply augmentation action to any potential core supply shortfall.
2. Includes Port Hueneme lease.
3. Includes DWCV carryover.
4. Take and put amounts limited due to water quality considerations.

Table A.3-8
In-Region Storage
Supply Characterization[1] Year 2026-2030
Repeat of 1988-1992 Hydrologies
(acre-feet per year)

Forecast Year	2026	2027	2028	2029	2030
Current Programs					
Metropolitan Surface Storage					
(DVL, Mathews, Skinner)	95,000	0	51,000	0	0
Flexible Storage in Castaic & Perris	0	0	154,000	0	0
Groundwater Storage					
Conjunctive Use	0	0	0	0	0
Subtotal of Current Programs	***95,000***	***0***	***205,000***	***0***	***0***
Programs Under Development					
Subtotal of Proposed Programs	***0***	***0***	***0***	***0***	***0***
Maximum Supply Capability	**95,000**	**0**	**205,000**	**0**	**0**

1. Supply characterization for the Drought Risk Assessment is based on core supplies as defined in WSCP Appendix 4. Flexible and storage supplies from CR, SWP, and In-Region may be exercised as supply augmentation action to any potential core supply shortfall.

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Appendix 4

WATER SHORTAGE CONTINGENCY PLAN

Appendix 4
WATER SHORTAGE CONTINGENCY PLAN

This Water Shortage Contingency Plan (WSCP) complies with California Water Code (CWC) Section 10632, which requires that every urban water supplier shall prepare and adopt a WSCP as part of its urban water management plan (UWMP). Section 10632.2 provides, "An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan...or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1." Notwithstanding, the CWC does not prohibit an urban water supplier from taking actions not specified in its WSCP, if needed, without having to formally amend its UWMP or WSCP.

The WSCP is a guide for the Metropolitan Water District of Southern California's (Metropolitan's) intended actions during water shortage conditions. It is meant to improve preparedness for droughts and other impacts on water supplies by describing the process used to address varying degrees of water shortages. Certain elements of the WSCP are required by the CWC, including response actions that align with six standard water shortage levels based on water supply conditions, as well as shortages resulting from catastrophic supply interruptions. The WSCP also describes Metropolitan's procedures for conducting an Annual Water Supply and Demand Assessment (Annual Assessment) that is required by CWC Section 10632.1 and is to be submitted to the California Department of Water Resources (DWR) on or before July 1 of each year, or within 14 days of receiving final allocations from the State Water Project (SWP), whichever is later.

Metropolitan's WSCP is included as Appendix 4 to its 2025 UWMP which will be submitted to DWR by July 1, 2026. However, this WSCP is created separately from Metropolitan's 2025 UWMP and can be amended, as needed, without amending the UWMP.

Organization of this Document

The WSCP covers the required elements as set forth by CWC Section 10632. Because Metropolitan is a wholesale urban water supplier, elements that pertain only to retail water suppliers are not addressed in this WSCP.[1] The document contains eight sections. Section A.4.1 is an introduction that explains the purpose of the WSCP and provides background on Metropolitan's service area and system. Section A.4.2 is a summary of the water supply analysis and water reliability findings from the 2025 UWMP, pursuant to CWC Section 10635. Section A.4.3 is a description of procedures

[1] WSCP elements that apply specifically to retailer water suppliers are: (1) a description of customer compliance, enforcement, appeal, and exemption procedures for triggered response actions (CWC Section 10632(a)(6)); (2) a description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1 (CWC Section 10632(a)(8)(c)); and (3) monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements (CWC Section 10632(a)(9)).

to conduct and approve the Annual Assessment. Section A.4.4 explains the WSCP's six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, 50, and more than 50 percent shortages and describes the WSCP's shortage response actions that align with the defined shortage levels. Section A.4.5 addresses communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments regarding any current or predicted shortages and any resulting shortage response actions. Section A.4.6 is a description of the legal authorities that enable Metropolitan to implement and enforce its shortage response actions. Section A.4.7 is a description of the financial consequences of and responses for drought conditions. Section A.4.8 addresses reevaluation and improvement procedures for monitoring and evaluating the functionality of the WSCP and describes the process to adopt, submit, and amend the WSCP.

A.4.1 Background Information on Metropolitan

Background

Metropolitan is a public agency organized in 1928 by a vote of the electorate of 13 Southern California cities. The agency was enabled by the adoption of the original Metropolitan Water District Act (MWD Act) by the California Legislature "for the purpose of developing, storing, and distributing water for domestic purposes." The MWD Act also allows Metropolitan to sell "surplus water not needed or required for domestic or municipal uses within the district for beneficial purposes." In 1992, the Metropolitan Board of Directors adopted the following mission statement:

> *"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."*

Water used in Southern California comes from several sources. The investments that Metropolitan has made and its ongoing efforts in many different areas coalesce toward its goal of long-term regional water supply reliability. The first function of Metropolitan was building the Colorado River Aqueduct (CRA) to convey water from the Colorado River. Deliveries through the CRA to member agencies began in 1941 and supplemented the local water supplies of the Southern California member cities. In 1960, to meet growing water demands in its service area, Metropolitan contracted with DWR for participation in the SWP, which delivers water to Metropolitan's service area via the California Aqueduct. SWP deliveries began in 1972. Metropolitan currently receives imported water from both of these sources: (1) Colorado River via the CRA, and (2) the SWP via the California Aqueduct. Beyond its core imported supplies from the Colorado River and SWP, Metropolitan actively supports efforts to develop storage and groundwater management programs and to increase conservation, water recycling, groundwater recovery, and seawater desalination projects.

Service Area

Metropolitan's service area covers the Southern California coastal plain. It extends about 200 miles along the Pacific Ocean from the city of Oxnard to the north to the international boundary with Mexico to the south, and it reaches as far as 70 miles inland from the coast. The total area served is approximately 5,200 square miles, and it

includes portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Table A.4-1 shows that although only 14 percent of the land area of the six Southern California counties is within Metropolitan's service area, approximately 86 percent of the population of those counties resides within Metropolitan's boundaries.

Table A.4-1
January 1, 2025 Area and Population in the Six Counties of Metropolitan's Service Area

County	Total County	In Metropolitan Service Area	Percent in Metropolitan
Land Area (Square Miles)			
Los Angeles County	4,085	1,399	34%
Orange County	796	698	88%
Riverside County	7,303	1,077	15%
San Bernardino County	20,105	239	1%
San Diego County	4,236	1,436	34%
Ventura County	1,855	371	20%
Metropolitan's Service Area	**38,380**	**5,221**	**14%**
Population (Persons)			
Los Angeles County	9,877,000	8,988,000	91%
Orange County	3,175,000	3,175,000	100%
Riverside County	2,496,000	1,949,000	78%
San Bernardino County	2,207,000	876,000	40%
San Diego County	3,330,000	3,186,000	96%
Ventura County	829,000	620,000	75%
Metropolitan's Service Area	**21,914,000**	**18,794,000**	**86%**

Source: State of California, Department of Finance, E-5 County/State Population and Housing Estimates- May 2025 release.

Metropolitan is currently composed of 26 member agencies, including 14 cities, 11 municipal water districts, and one county water authority. Metropolitan is a water wholesaler with no retail customers. It provides treated and untreated water to its member agencies.

Metropolitan's 26 member agencies deliver to their customers a combination of local groundwater, local surface water, recycled water, desalinated seawater, and imported water received from Metropolitan. For some member agencies, Metropolitan supplies all the water used within that agency's service area, while others obtain varying amounts of water from Metropolitan to supplement local supplies. Between 2015 and 2024, Metropolitan has provided between 39 and 53 percent of the municipal, industrial, and agricultural water used in its service area. The remaining water supply comes from local wells, local surface water, recycling, and the city of Los Angeles' aqueducts from the Owens Valley/Mono Basin east of the Sierra Nevada. Member agencies also implement conservation programs that can be considered part of their supplies.

Some member agencies provide retail water service, while others provide water to their local area as wholesalers. Table A.4-2 shows Metropolitan's member agencies and the

type of service that they provide. As shown in the table, 15 member agencies provide retail service to customers, nine provide only wholesale service, and two provide a combination of both. Throughout Metropolitan's service area, approximately 250 retail water suppliers directly serve the population.

Table A.4-2
Metropolitan's Member Agencies and Type of Water Service Provided

Member Agency	Retail or Wholesale
Los Angeles County	
Beverly Hills, City of	Retail
Burbank, City of	Retail
Central Basin Municipal Water District	Wholesale
Compton, City of	Retail
Foothill Municipal Water District	Wholesale
Glendale, City of	Retail
Las Virgenes Municipal Water District	Retail
Long Beach, City of	Retail
Los Angeles, City of	Retail
Pasadena, City of	Retail
San Fernando, City of	Retail
San Marino, City of	Retail
Santa Monica, City of	Retail
Three Valleys Municipal Water District	Wholesale
Torrance, City of	Retail
Upper San Gabriel Valley Municipal Water District	Wholesale
West Basin Municipal Water District	Wholesale
Orange County	
Anaheim, City of	Retail
Fullerton, City of	Retail
Municipal Water District of Orange County	Wholesale
Santa Ana, City of	Retail
Riverside County	
Eastern Municipal Water District	Retail & Wholesale
Western Municipal Water District	Retail & Wholesale
San Bernardino County	
Inland Empire Utilities Agency	Wholesale
San Diego County	
Eastern Municipal Water District	Wholesale
San Diego County Water Authority	Wholesale
Ventura County	
Calleguas Municipal Water District	Wholesale

Reliability Planning

Metropolitan continuously engages in planning for various aspects of its water management, including operations, long-term reliability, and emergency response. These planning efforts include the 1996 Integrated Water Resources Plan (IRP) and its three updates in 2004, 2010, and 2015; the 2020 IRP Regional Needs Assessment; the WSCP; the Water Surplus and Drought Management (WSDM) Plan; the Water Supply Allocation Plan (WSAP); Metropolitan's Emergency Storage Objective; Seismic Risk Assessment and Mitigation Plan; and most recently the Climate Adaptation Master Plan for Water (CAMP4W). Collectively, they provide a policy framework, operating guidelines, and resource targets for Metropolitan to ensure regional water supply reliability.

The IRP is Metropolitan's evolving long-term plan to assure adequate water supplies for Southern California. The first IRP was adopted in 1996 to address the complexity of developing, maintaining and delivering water to meet changing demands in the face of growing challenges. The IRP has been updated several times. In 2021, Metropolitan's IRP Regional Needs Assessment incorporated planning for multiple future scenarios to address an extended range of uncertainty. While Metropolitan coordinates regional supply planning through its inclusive IRP process, Metropolitan's member agencies also conduct their own planning analyses, including their own urban water management plans, and may develop projects independently of Metropolitan.

The WSCP is designed to be consistent with the WSDM Plan and the WSAP described below. Throughout the year, Metropolitan evaluates member agency demands, available water supplies, and existing water storage levels on a monthly basis to determine the appropriate actions identified in the WSDM Plan.

The 1999 WSDM Plan provides policy guidance for managing regional water supplies during surplus and shortage conditions. Similar in concept to the WSCP, the WSDM Plan provides an overall vision for operational supply management and characterizes a flexible sequence of actions to minimize the probability of severe shortages and reduce the likelihood of extreme shortages. WSDM Plan principles guide the specific actions to be taken under WSCP shortage stages (see section A.4.4). Data collection, continual analysis, and monthly reporting processes of WSDM Plan implementation is the basis for Metropolitan's Annual Water Supply Demand Assessment, which has been provided to the state annually since July 2022. The WSDM Plan is included as Attachment A to this WSCP.

The WSAP is Metropolitan's policy and formula for equitably allocating available water supplies to the member agencies during extreme water shortages when Metropolitan determines it is unable to meet all of its demands. The WSAP is included as Attachment B to this WSCP.

Metropolitan's Emergency Storage Objective is the regional planning estimate for emergency storage, which represents the amount of water that Metropolitan would hold in storage for the region in preparation for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California: the CRA, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct. In 2019, Metropolitan and its member agencies completed a process to

update the planning estimate of Metropolitan's Emergency Storage Objective. The emergency storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service.

Beginning January 2020, CWC Section 10632.5 mandates urban water suppliers to include in their UWMP a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. For Metropolitan, this requirement was addressed as part of developing its resilience strategy and is presented in detail in Metropolitan's seismic resiliency reports in Appendix 8 to the 2025 UWMP, which are incorporated herein by reference.

A.4.2. Analysis of Water Supply Reliability

Besides the WSCP, the Urban Water Management Planning Act requires suppliers to conduct two other planning analyses to evaluate supply reliability. The first is a Water Reliability Assessment that compares the total water supply sources available to the water supplier with long-term projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The second is a Drought Risk Assessment that evaluates a drought period that lasts five consecutive water years starting from the year following when the assessment is conducted.

Metropolitan completed its Water Reliability Assessment and Drought Risk Assessment as part of the 2025 UWMP. Through the Water Reliability Assessment, Metropolitan determined that, under the conditions required by the Urban Water Management Planning Act, it has supply capabilities sufficient to meet expected demands from 2030 through 2050 under a single dry-year condition and a period of drought lasting five consecutive water years, as well as in a normal water year hydrologic condition. Metropolitan's near-term Drought Risk Assessment revealed that its supply capabilities are expected to exceed its projected water use for the year 2027. However, estimates of projected water supply and use reveal that there could be a possible shortfall of core supplies in 2026, 2028, 2029, and 2030. This shortfall is largely triggered by the assumed low supply conditions from the SWP under a repeat of the historical condition of 1988 to 1992, which is modeled at eight percent of Table A allocation for 2026, seven percent for 2028, eight percent for 2029, and 13 percent for 2030. Actual supply conditions for the next five years may prove different from historic supply conditions. The WSCP shows Metropolitan's potential shortage response actions if such shortfalls were to happen. The Drought Risk Assessment projected supplies and demands for the years 2026 through 2030 using the driest five-year sequence.

Metropolitan's principal sources of water supplies are the SWP and the Colorado River. Metropolitan receives water delivered from the SWP under State Water Contract provisions, including contracted supplies, use of carryover storage in San Luis Reservoir, and surplus supplies. Metropolitan holds rights to Colorado River water for CRA diversion at Lake Havasu. Water management programs supplement these Colorado River supplies. To secure additional supplies, Metropolitan has groundwater banking partnerships and water transfer and storage arrangements within and outside its service area.

Hydrologic conditions and environmental regulations can have a significant impact on Metropolitan's imported water supply sources. For Metropolitan's SWP supplies, precipitation in California's northern Sierra Nevada during the fall and winter helps replenish storage levels in Lake Oroville, a key SWP facility. The source of Metropolitan's Colorado River supplies is primarily the watersheds of the Upper Colorado River Basin in the states of Colorado, Utah, and Wyoming. Although precipitation is primarily observed in the winter and spring, summer storms are common and can affect water supply conditions. Hydrologic variability, potential climate change, and regulatory risk are embedded in Metropolitan's modeling efforts. Metropolitan's

modeling utilizes historical hydrologic conditions from 1992 to 2021 to simulate expected demands on Metropolitan supplies, as well as capacities and constraints of its storage facilities and supply programs. While potential impacts from climate change remain subject to study and debate, climate change is among the uncertainties that Metropolitan seeks to address through its various planning processes. Metropolitan's 2020 IRP Regional Needs Assessment and Climate Adaptation Master Plan for Water (CAMP4W) further addresses ways to account for and mitigate these uncertainties.

As demonstrated by the findings of both the Water Reliability Assessment and the Drought Risk Assessment, Metropolitan is able to mitigate the challenges posed by hydrologic variability, potential climate change, and regulatory risk on its imported supply sources through the significant storage capabilities it has developed over the last two decades, both dry-year and emergency storage.

A.4.3. Annual Water Supply and Demand Assessment Procedures

As an urban water supplier, Metropolitan is required under CWC Section 10632(a)(2) to prepare and submit an "annual water supply and demand assessment" (Annual Assessment). The Annual Assessment is a determination of Metropolitan's near-term outlook for supplies and demands and how a perceived shortage may relate to WSCP shortage stage response actions in the current calendar year. This determination will be based on known circumstances and information available to Metropolitan at the time of analysis. Beginning in 2022, the Annual Assessment has been required to be submitted by July 1 each year, as mandated by CWC Section 10632.1. CWC Section 10632.1 also states that *"[a]n urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later*." The Annual Assessment and related reporting are to be conducted based on the procedures described in this WSCP. This section describes Metropolitan's procedures for conducting the Annual Assessment, which include: (1) the written decision-making process to determine water supply reliability; and (2) the key data inputs and assessment methodology to evaluate water supply reliability for the current year and one dry year.

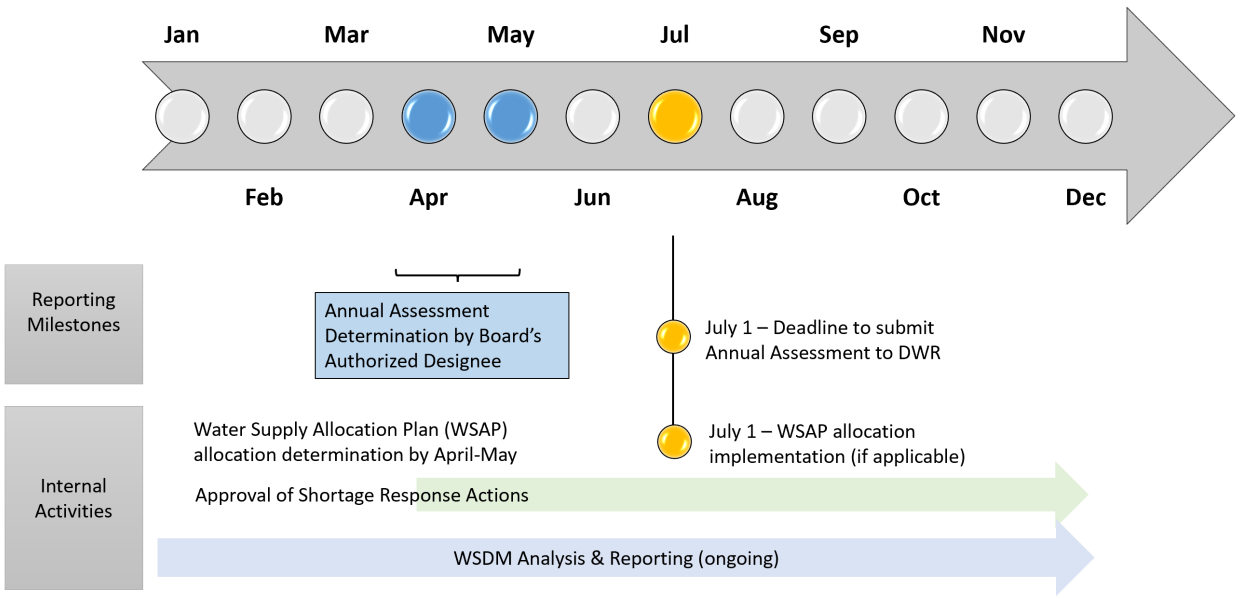
Steps to Approve the Annual Assessment Determination

The Annual Assessment will be primarily based on Metropolitan's ongoing WSDM supply-demand tracking process which is exhibited in reporting to the Board of Directors throughout the year. WSDM planning activities involve examination of developing demand and supply conditions for the calendar year, as well as considerations of potential actions consistent with the WSDM Plan. These analyses provide key information for Metropolitan to manage resources to meet a range of estimated demands and adjust to changing conditions throughout the year.

As a water supply wholesaler, Metropolitan's water demands are a function of retail-level demands and local water production. Water from Metropolitan serves as a supplemental source of supply for its 26 member agencies. For many member agencies, their primary source of water is produced locally from groundwater basins, surface reservoirs, recycled water projects, groundwater recovery projects, and seawater desalination. When local supplies are not enough to meet retail demands, member agencies purchase supplemental water from Metropolitan. Some member agencies rely heavily on Metropolitan due to limited local supplies. As described below, Metropolitan collects estimates of projected consumptive and replenishment water demands from its member agencies. This information is adjusted to determine unconstrained demands for the purpose of the Annual Assessment shortage percentage evaluation.

By June, Metropolitan staff provides a completed Annual Assessment for approval by the Board's authorized designee with expressly delegated authority for approval of Annual Assessment determinations. Upon approval, Metropolitan staff submits the Annual Assessment to DWR by July 1. Figure A.4-1 provides a graphic representation of the decision-making process.

Figure A.4-1
Sample Annual Assessment Decision-Making Timeline



Data Inputs and Assessment Methodology

This section describes how Metropolitan will evaluate water supply reliability for the current year and one dry year for the purpose of the Annual Assessment. The Annual Assessment determination will be based on considerations of available core water supplies, unconstrained water demand, and infrastructure considerations. The difference between core water supplies and unconstrained demand will be used to determine what, if any, shortage stage is expected under the WSCP framework. The standard shortage stage percentage will be calculated by dividing the difference between core supplies and unconstrained demand by unconstrained demand. This calculation will be performed separately for anticipated current-year conditions and for an assumed dry-year condition.

Locally Applicable Evaluation Criteria

Because shortages are based on the difference between expected core supplies and unconstrained demand under current year and dry year conditions, the locally-applicable evaluation criteria to be used in the Annual Assessment for determining a shortage include the following:

- Characterization of current year and dry year scenarios based on best-available data, including anticipated hydrologic conditions for Metropolitan's supply source watersheds in the Colorado River basin and Northern California, as well as for local conditions in Metropolitan's service area in Southern California.

- Estimation of available core supplies (see below) for current year and dry year scenarios
- Estimation of unconstrained demands (see below) for current year and dry year scenarios

Together, these three criteria provide the necessary information to calculate shortage percentages by dividing the difference between core supplies and unconstrained demand by unconstrained demand, under current year and dry year scenarios. These criteria findings will also be given additional context and influenced by infrastructure considerations discussed below which will differ from year to year.

The information and analyses that comprise the Annual Assessment will be based on ongoing planning processes that include WSDM supply-demand reporting. The Annual Assessment represents a mid-year evaluation at a given point in time; even after formal approval and submittal of the Annual Assessment determination by July 1, Metropolitan will continue to monitor emerging supply and demand conditions and take appropriate actions consistent with the flexibility and adaptiveness inherent to this WSCP. Some locally-applicable conditions that affect Metropolitan's wholesale supply and demand, such as the Higher Priority Water Use Adjustment for Colorado River use (see below), local supply production, annual SWP allocations, the status of Metropolitan storage accounts, the status of the local groundwater basins, changed water use practices, and local economic activity entail a high degree of uncertainty and can differ significantly from earlier projections throughout the year.

Description and Quantification of Each Source of Water Supply (Core Supplies)

Metropolitan's core water supplies are counted as the supply component of the Annual Assessment. Core supplies include estimated water supplies from the Colorado River and the SWP for the current year. Imported core supplies vary from year to year and are influenced by annual weather and hydrology, as well as demand by other higher priority users and operational and regulatory factors.

Because core supplies are used every year when available, they are differentiated from the WSCP's shortage response actions for supply augmentation; supply augmentation actions are comprised of Metropolitan's portfolio of water storage reserves and flexible supply sources that are available on an as-needed basis.

Metropolitan's core supplies come from several programs, which are shown in Table A.4-3 and described below.

Table A.4-3
Core Water Supplies

Source	Core Supply
Colorado River	Colorado River Basic Apportionment Higher Priority Water Use Adjustment to Colorado River Basic Apportionment IID/MWD Conservation Program PVID Fallowing Program Quechan Seasonal Fallowing Program Quechan Diversion Forbearance Program Lower Colorado Water Supply Project Exchange with SDCWA Exchange with the United States
State Water Project	MWD SWP Table A SWP Article 21 Interruptible Supplies SWP Port Hueneme Lease of Ventura Table A Desert Water Agency/Coachella Valley Water District/Metropolitan Water Exchange and Advance Delivery Programs

Colorado River

Colorado River Basic Apportionment

Metropolitan built, owns, and operates the 242-mile CRA. The CRA originates at Lake Havasu on the Colorado River and winds through a series of pump stations and reservoirs through the California desert to its terminal reservoir at Lake Mathews in Riverside County. The CRA has a full delivery capacity of 1.25 MAF.

The state of California holds a 4.4 MAF per year normal apportionment to Colorado River water. Metropolitan has the Fourth Priority right to 550,000 AF per year of the State's normal apportionment. Metropolitan also holds the Fifth Priority right to an additional 662,000 AF per year which is utilized during surplus conditions or when supplies from other Colorado River users are available.

Higher Priority Water Use Adjustment to Metropolitan's Colorado River Basic Apportionment

Entitlements to use Colorado River water in California under priorities 1, 2, and 3 are limited to 3.85 MAF per year. Priority 3(a) is held by the Imperial Irrigation District and the Coachella Valley Water District (CVWD), totaling 3.43 MAF. After accounting for contractual conservation and transfers, any unused volume available to Priority 3(a) becomes available for use by Metropolitan. Of the 3.85 MAF, the remaining 420,000 AF is available for use under priorities 1, 2, and 3(b) held by the Palo Verde Irrigation

District and the Yuma Project lands within California. Any unused amount from this volume is available for use by Metropolitan. However, Metropolitan must forego its otherwise available Colorado River supplies to meet priority 1, 2, and 3(b) use that exceeds 420,000 AF. Lastly, there are additional high-priority present perfected rights within California not incorporated into the other priorities, for the sake of which Metropolitan must forego its otherwise available Colorado River supplies if those present perfected uses exceed 14,500 AF. The net sum of these volumes constitutes a higher priority water use adjustment to Metropolitan's base supply.

Imperial Irrigation District-Metropolitan Conservation Program

Since 1988, Metropolitan has funded water conservation programs within Imperial Irrigation District's (IID) service area. The amount of water conserved by these programs is then transferred to Metropolitan. Conservation approaches range from distribution system improvements (such as canal lining, spill capture and the installation of non-leak irrigation gates) to efficient on-farm water management practices (such as delivering water to farmers on a 12-hour rather than a 24-hour basis). Through this program, a total of 105,000 AF per year is conserved and made available to Metropolitan.

Palo Verde Irrigation District Land Management, Crop Rotation, and Water Supply Program

In 2005, Metropolitan entered a 35-year program with the Palo Verde Irrigation District (PVID). Under the program, participating farmers in PVID are paid to reduce their water use by leaving acreage unirrigated. A base amount of 25 percent of the program acreage must be fallowed every year. Metropolitan may elect to call for additional acreage to be fallowed up to 100 percent. Fallowing calls must be made at least one year in advance by July 31 of each year and take effect on August 1 of the following year. The reduced consumptive use due to fallowed lands reduces uses under priorities 1, 2, and 3(b), thereby increasing the Colorado River water supply available to Metropolitan. The fallowing program saves a minimum of 33,000 AF per year and up to 133,000 AF in certain years.

Metropolitan/Quechan Seasonal Fallowing Program

In November 2021, Metropolitan's Board authorized a two-year pilot seasonal fallowing program with the Quechan Tribe (Tribe) of the Fort Yuma Indian Reservation. In November 2023, Metropolitan's Board authorized extending the program to the end of 2026. Under the program, participating farmers on land they lease from the Tribe are paid to reduce their water use by not irrigating a portion of this land. A maximum of 1,600 acres can be fallowed in any given year. It is estimated that the program provides up to 3,500 AF per year of Colorado River water. This water is available in any year as needed and in accordance with the provisions described in the agreements with farmers and the Tribe.

Quechan Diversion Forbearance Program

The Quechan Tribe (Tribe) on the Fort Yuma Indian Reservation (part of the Yuma Project) holds a higher priority water right than Metropolitan. In 2005, Metropolitan

entered into a settlement agreement with the Tribe, under which it is entitled to divert 20,000 AF per year or the amount necessary to supply irrigation and related uses on 2,998.5 acres (whichever is less), in addition to the water the Tribe is entitled to under the 1964 Arizona v. California decree. Of this additional entitlement, 13,000 AF or the amount necessary for irrigation and related uses on 1,949.03 acres became available to the Tribe in 2006 (the remainder will become available in 2035). Metropolitan and the Tribe agreed that if it chooses to limit proposed development and forbear the diversion of any of the additional water, then Metropolitan will provide an incentive payment to the Tribe on the condition that such water is received by Metropolitan. The water supply benefit to Metropolitan is less than the cited 13,000 AF and 7,000 AF volumes since the amounts are diversions and not consumptive use. (A significant portion of the Tribe's additional diversions would pass to Metropolitan as agricultural return flows, even without the agreement.)

Lower Colorado Water Supply Project

Up to 10,000 AF of groundwater is pumped by the Lower Colorado Water Supply Project near the All-American Canal and is discharged to the Canal. IID reduces its net diversions of Colorado River water by an amount equal to the amount of Project water discharged into the Canal, permitting entities along the Colorado River that do not have rights or have insufficient rights to divert Colorado River water to obtain a supply of water. In 2007, Metropolitan entered into a contract with the USBR and the City of Needles to utilize the unused Project capacity.

Exchange with the San Diego County Water Authority (SDCWA)

Through a transfer agreement with IID and by funding the lining of the All-American and Coachella Canals, SDCWA acquired conserved Colorado River water totaling 277,700 AF per year. SDCWA makes this water available at Lake Havasu for Metropolitan to divert. Metropolitan takes possession of the water and provides a matching volume from Metropolitan’s blended supplies to SDCWA by exchange.

Under the transfer agreement with IID, the stabilized annual transfer volume of 200 TAF is generated from conservation of water through on-farm efficiency conservation arrangements made by IID with its customers and other system efficiency measures.

The Coachella Canal Lining Project consists of a 35-mile concrete-lined canal, including siphons, which replaced an earthen canal. The project was completed in December 2006 and conserves 30,850 AF annually. The All-American Canal Lining Project consists of a concrete-lined canal constructed parallel to 23 miles of earthen canal and was completed in 2009, conserving 67,700 AF annually.

Pursuant to the QSA and related agreements, the 98,550 AF of water resulting from these projects annually is allocated as follows: 16,000 AF to the San Luis Rey Settlement Parties in San Diego County, 77,700 AF to SDCWA, and 4,850 AF for the Coachella Canal Lining Project mitigation.

In 2025, following many years of litigation between the parties, SDCWA and Metropolitan entered into a settlement agreement that amended the exchange agreement. Under the terms of the 2025 exchange agreement, SDCWA pays a minimum amount for exchange of 227,000 AF of water from Metropolitan each year at

an agreed-upon exchange price, whether or not SDCWA makes that amount available to Metropolitan for exchange. SDCWA may still exchange up to 277,700 AF with Metropolitan. Monthly deliveries may be variable to meet SDCWA's variable demands. SDCWA may also offer to sell exchange water deliveries to Metropolitan member agencies as a right of first refusal, and Metropolitan has a right of second refusal to buy SDCWA's Colorado River water at Lake Havasu if no member agency purchases exchange deliveries from SDCWA. Any sales of exchange water deliveries by SDCWA to a member agency change only the location of the deliveries, but keep the water within Metropolitan's service area. Additional operational and other conditions apply to the rights of refusal under the 2025 exchange agreement.

Exchange with the United States

The United States furnishes the 16,000 AF allocated to the San Luis Rey Settlement Parties from the All-American and Coachella canal lining projects at Metropolitan's Colorado River Intake on Lake Havasu. Metropolitan takes possession of the water and by exchange delivers an equal volume of Metropolitan's blended supplies to SDCWA. By separate agreement, SDCWA conveys the water to the San Luis Rey Settlement Parties. So long as water conserved by the All-American Canal and Coachella Canal Lining Projects is allocated to, and available for use by, the San Luis Rey Settlement Parties, the United States will make 16,000 AF available for diversion by Metropolitan in perpetuity.

State Water Project

Table A Contract Amount

In accordance with its participation contract with DWR, Metropolitan's maximum contractual amount listed on Table A of the SWP contract is for 1,911,500 AF per year. The amount of supply available on an annual basis is allocated as a percentual of the Table A contractual amount.

DWR estimates the amount of supplies that are available each year based on hydrological conditions, operational and environmental constraints, as well as other obligations. Annual SWP allocations have ranged from 5 percent to 100 percent of the Table A amounts.

Article 21 Interruptible Supplies

Metropolitan has a contract to water supplies that are made available on an intermittent basis. Storm flows can occasionally make water supplies available that are in excess of the Table A allocation. SWP contractors can take delivery of these supplies, with their rights being based on their proportional Table A contract amounts. Historically, Article 21 interruptible supplies have ranged from 0 to 240,000 AF annually.

SWP Port Hueneme Lease of Ventura Table A

Metropolitan has a right to delivery of up to 1,850 AF of Table A supply from the Ventura County Watershed Protection District (Ventura), one of 29 SWP contractors, via a sublease agreement with the Port Hueneme Water Agency (Port Hueneme). United Water Conservation District, one of three agencies holding a contract right to Ventura Table A supply, leases this portion of their total 5,000 AF of Table A supply to Port

Hueneme, which in turn subleases the Table A supply to Metropolitan. The long-term lease is a condition of the 1996 annexation of the Port Hueneme service area to Calleguas Municipal Water District and Metropolitan. This water supply is in addition to Metropolitan's Table A, and the amount available each year is determined by the SWP allocation, with 1,850 AF available at a 100 percent Table A allocation.

Desert Water Agency/Coachella Valley Water District/Metropolitan Water Exchange and Advance Delivery Programs

The Desert Water Agency (DWA) and CVWD, both in Riverside County, have rights to SWP deliveries, but do not have any physical connections to the SWP facilities. Both agencies are adjacent to the CRA. For DWA and CVWD to obtain water equal to their SWP allocations, Metropolitan has agreed to exchange an equal quantity of its Colorado River water for DWA and CVWD's SWP water. DWA has a SWP Table A contract right of 55,750 AF per year, and CVWD has a SWP Table A contract right of 138,350 AF per year, for a total of 194,100 AF per year. Additionally, CVWD has a long-term water supply agreement for 9,500 to 16,500 AF annually from the Rosedale Rio-Bravo Water Storage District.

Under the existing agreements, Metropolitan provides water from its CRA to DWA and CVWD in exchange for SWP deliveries. Metropolitan can deliver additional water to its DWA/CVWD service connections, permitting these agencies to store water. When supplies are needed, Metropolitan can then receive its full Colorado River supply, as well as the SWP allocation from the two agencies, while the two agencies can rely on the stored water to meet their water supply needs. The amount of DWA and CVWD SWP Table A water available to Metropolitan depends on the annual SWP allocation.

Unconstrained Demands

For the purpose of the Annual Assessment and WSCP, CWC Section 10632(a)(2)(B)(i) directs Metropolitan to use current year "unconstrained demand" when assessing water supply reliability. The WSCP and Annual Assessment define unconstrained demand as expected water use in the current assessment year, based on recent water use, and before any projected shortage response actions that may be taken under the WSCP. Unconstrained demand is distinguished from observed demand, which may be constrained by preceding, ongoing, or future actions, such as emergency supply allocations during a multi-year drought. WSCP shortage response actions, if any are in place, that result in extraordinary demand reductions in the current year to constrain demand are inherently extraordinary; routine activities such as ongoing conservation programs and regular operational adjustments are not considered as constraints on demands.

To forecast near-term demands, Metropolitan begins by gathering data from its member agencies. Each July, member agencies submit their five-year demand forecasts to Metropolitan, which serve as the foundation for demand forecasting. Metropolitan then builds upon these projections to develop its own near-term forecast for its internal planning and monthly WSDM supply-demand reporting. This forecast incorporates additional factors, such as historical demand trends, changes in local supply production, weather patterns, water-use efficiency implementation, retail demand estimates, and the latest updates from member agencies.

Because these forecasted demands would be "constrained" observed demands rather than unconstrained demands, Metropolitan will adjust its near-term demand forecast for the Annual Assessment to account for extraordinary demand management measures that Metropolitan may intend or have already put into effect for the current year. Extraordinary demand management measures may include intensified communication and public outreach, and shortage allocations to its member agency customers through implementation of Metropolitan's WSAP. Non-extraordinary water savings from regular conservation and community outreach activities are considered part of Metropolitan's baseline demands and are not counted again for assessments of unconstrained demand.

Water Conditions for Current Year Available Supply Considering Current Year Conditions and One Dry Year

CWC Section 10632(a)(2)(B)(ii) requires the Annual Assessment to determine *"current year available supply, considering hydrological and regulatory conditions in the current year and one dry year."* The Annual Assessment will include two separate estimates of Metropolitan's annual water supply and unconstrained demand using: (1) current year conditions, and (2) assumed dry year conditions. Accordingly, the Annual Assessment's shortage analysis will present separate sets of findings for the current year and dry year scenarios. The CWC does not specify the characteristics of a dry year, allowing discretion to the Supplier. Metropolitan will use this discretion to refine and update its assumptions for a dry year scenario in each Annual Assessment as information becomes available.

In the 2025 UWMP, the "single dry year" is characterized to resemble conditions as a year in which conditions reflect the lowest water supply available to the Supplier. Metropolitan developed estimates of future demands and supplies from local sources and from Metropolitan sources based on 100 years (1922-2021) of historic hydrologic conditions. Supply and demand analyses for the single-dry year case were based on conditions affecting the SWP as this supply availability fluctuates the most among Metropolitan's sources of supply. Based on the 100-year period, 1977 was the single driest year for SWP supplies to Metropolitan. In addition, staff analysis of the 8-River Index indicated that 1977 was the single driest year from 1922 through 2021. The 8-River Index is used by DWR and other water agencies as an estimate of the unimpaired runoff (or natural water production) of the Sacramento and San Joaquin River basins, which are sources of water for the SWP.

Infrastructure Considerations

The Annual Assessment will consider any infrastructure issues that may pertain to near-term water supply reliability, including repairs, construction, and environmental mitigation measures that may temporarily constrain capabilities, as well as any new projects that may add to system capacity.

Metropolitan has five regional water treatment plants, with capacities presented in Table A.4-4. Portions of Metropolitan's service area may receive water treated by one or a combination of several of these water treatment plants. Over the last 40 years, Metropolitan effectively delivered to its member agencies water supplies to meet demands ranging from 1.2 MAF per year to over 2.5 MAF per year.

Table A.4-4
Metropolitan's Water Treatment Plants

Water Treatment Plant	Capacity (in MGD)
Jensen	750
Weymouth	520
Diemer	520
Mills	220
Skinner	350

Note: Rated capacity. Effluent capacities may be less to account for backwash.

In addition to the treatment plants, Metropolitan operates a conveyance and distribution system that is flexible and adaptable allowing delivery of supplies from a combination of SWP, Colorado River, and regional storage sources to meet demands throughout its service area, as shown in Figure A.4-2. However, system distribution capabilities and limitations can add complexity to near-term reliability. For example, a portion of Metropolitan's service area is highly dependent on SWP supplies and can only be delivered limited amounts of Colorado River supplies due to hydraulic constraints in the system.

Extreme drought between 2020 and 2022 resulted in the lowest cumulative three-year total water supply allocation from the SWP. The low allocations required Metropolitan and member agencies to adjust operations and implement measures developed during the previous drought on the SWP, to preserve water for areas in the system that were solely dependent on SWP supplies. Despite the efforts to conserve SWP supplies, in April 2022, Metropolitan's Board approved a resolution declaring a water shortage emergency within the SWP-dependent areas and mandated an emergency water conservation program within those areas. The disparity of impacts from the drought was exacerbated by limitations in the system that restrict the movement of Colorado River water and stored SWP supplies within Diamond Valley Lake and other storage facilities from reaching the SWP-dependent areas.

In August 2022, the Board adopted a resolution affirming Metropolitan's commitment to regional reliability to ensure all member agencies receive equivalent water supply reliability through an interconnected and robust system of supplies, storage, and programs. In response, Metropolitan and its member agencies conducted the SWP Dependent Area Drought Mitigation Workshops to identify drought solutions to prevent a recurrence of the disproportionate effects of the low SWP allocations. The workshops resulted in a proposed Drought Mitigation Action Portfolio.

The Drought Mitigation Action Portfolio recommends projects for implementation to provide timely relief to the SWP-dependent areas in the near term that do not require significant modifications of the existing infrastructure and identifies potential mid-term projects that can be implemented after the removal of system constraints through projects currently in development. The portfolio also provides alternative pathways to

achieve long-term equitable supply reliability for the region through a balanced approach of infrastructure improvements, new storage and supply programs, and local supply development and demand management as directed by the Board.

The recommended drought portfolio is divided into two categories: Category 1 – Cost-Effective Projects for Timely Relief and Category 2 – Projects for Further Consideration. Category 1 projects provide a baseline of improved reliability for the SWP-dependent areas via improved access to existing storage and Colorado River supplies. Category 2 projects have the potential to provide broader drought relief and greater region-wide benefits but would require larger investments, longer implementation periods, and higher implementation risk.

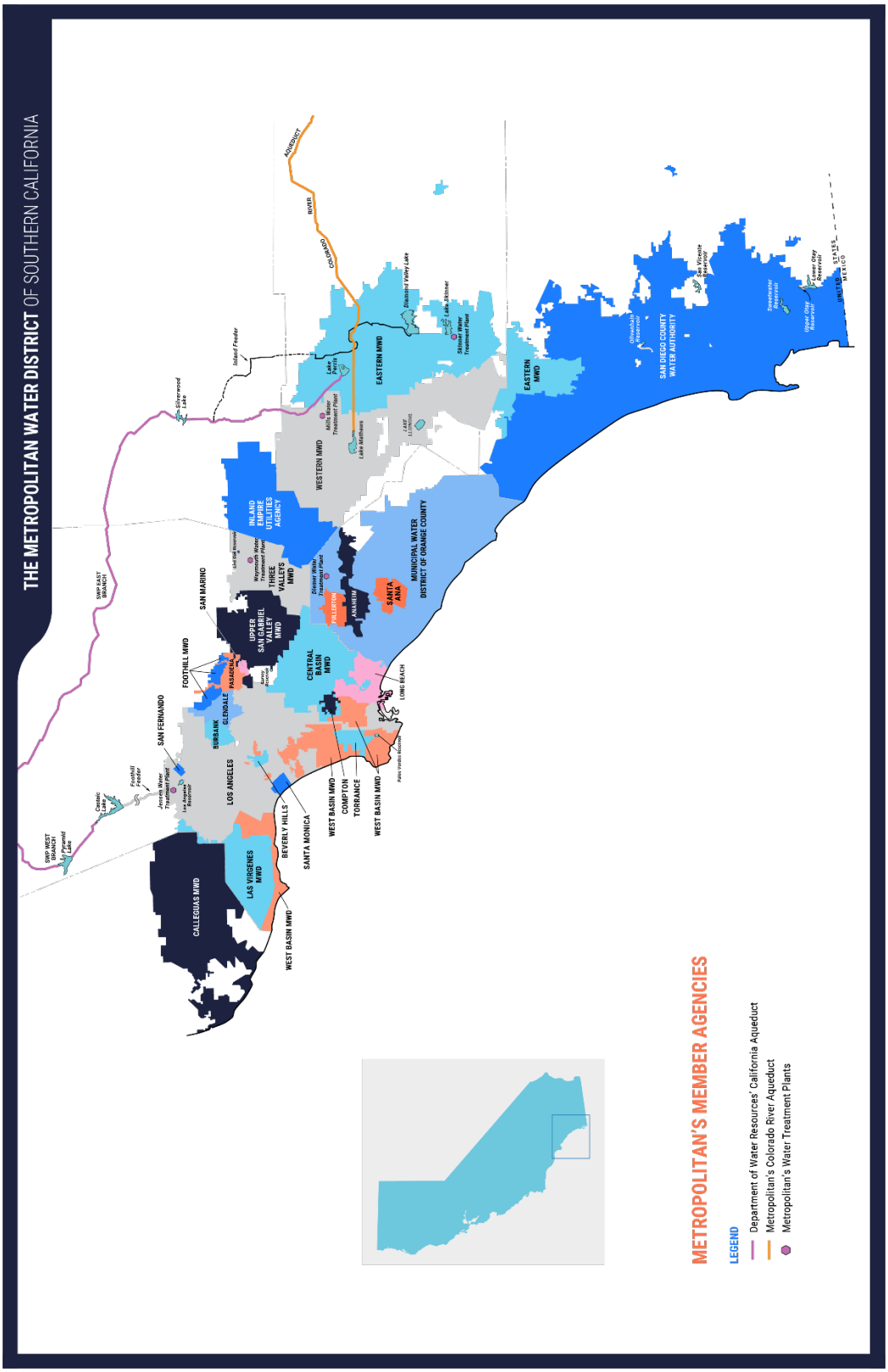
Two of the Category 1 projects are currently being implemented – (1) the DVL to Rialto Project, which will enable delivery of up to 120 cfs of stored SWP supplies in DVL or Colorado River water to Metropolitan's eastern SWP-dependent area serviced by the Rialto Pipeline, and (2) the Sepulveda Feeder Pump Stations Project Stage 1, which will construct two pump stations on the Sepulveda Feeder to deliver up to 30 cfs of treated Colorado River or DVL supplies from Metropolitan's Common Pool area to the western SWP-dependent area. Three other identified Category 1 projects remain in development. These are listed below.

- **Burbank Water and Power Service Connection B-5 to B-5A Shift** – This project would construct a pump station at the Valley Blending Facility to enable Burbank to blend water from the supply side of the Greg Avenue Pump Station called the B-5A Service Connection. The shift from the Service Connection B-5 to B-5A would enable Metropolitan to deliver additional water from the Colorado River that is treated at the Weymouth Plant and pumped by the Greg Ave Pump Station to the western SWP-dependent area.
- **Three Valleys Municipal Water District Miramar Pumpback System Upgrade** – Three Valleys Municipal Water District's Miramar system normally takes water from the Rialto Pipeline and treats it at its Miramar Water Treatment Plant before delivery into its distribution system. The Miramar Pumpback System can take treated water from the F.E. Weymouth Water Treatment Plant (Weymouth Plant) and deliver those supplies to the Miramar system through a series of pumps, offsetting the need for SWP deliveries from the Rialto Pipeline. The Miramar Pumpback System Upgrade project would increase the capacity of the existing system from 15 cfs to 30 cfs.
- **Sepulveda Feeder Pump Stations Project, Stage 2** – This project would expand the Sepulveda Feeder pumping operation to an ultimate capacity of 160 cfs. Stage 1 of the project is being designed to accommodate a future expansion under Stage 2.

The Category 2 projects require greater time for development and larger investment for implementation and are in the planning stage to ensure a thorough and collaborative assessment of their effectiveness, benefits, and risks. Implementation of different Category 2 projects will depend on the outcome of the CAMP4W evaluation, which assesses the effectiveness of different projects in mitigating the long-term supply and demand gaps and providing climate adaptation benefits. This process will allow for a

thorough evaluation considering both the risks and rewards of future investments and apply the adaptive management framework to adjust the implementation plan of drought mitigation actions based on changing conditions.

Figure A.4-2
Metropolitan's Service Area



Throughout each year, Metropolitan regularly carries out preventive and corrective maintenance of its facilities. Metropolitan plans and performs shutdowns to inspect and repair pipelines and facilities and support capital improvement projects. These shutdowns involve a high level of planning and coordination within Metropolitan, as well as with member agencies, other affected organizations, contractors, and the community. These shutdowns are scheduled to ensure that major portions of the distribution system are not out of service at the same time. Operational flexibility within Metropolitan's system and the cooperation of member agencies allow shutdowns to be successfully completed while continuing to meet all system demands.

Metropolitan's Infrastructure Reliability Strategy helps to ensure long-term reliable performance of the system in an efficient and cost-effective manner. Infrastructure reliability is addressed through three programs: the Maintenance Management Program, the Infrastructure Protection Plan, and the Dam Safety Program. The activities performed under these programs allow Metropolitan to extend the life span of its facilities and equipment and improve the overall reliability of the entire conveyance, treatment, and distribution system. In addition, seismic resiliency issues are addressed in the Seismic Risk Assessment and Mitigation Plan, which is included in Appendix 8 to the 2025 UWMP and incorporated herein by reference.

In the event that Metropolitan anticipates that an infrastructure issue is likely to impede or expand Metropolitan's capability to convey, treat, or distribute water during the current year, then the issue would be documented, and the determination of water reliability in the Annual Assessment would be adjusted accordingly.

Other Factors

Water quality is of paramount importance to water supply reliability. Metropolitan owns and operates five water treatment plants. Metropolitan is a national leader in providing safe drinking water that meets increasingly stringent standards, testing for over 400 constituents and performing nearly 250,000 water quality tests annually on samples gathered throughout its distribution system. Metropolitan's Water Quality Laboratory analyzes these samples to ensure that Metropolitan's delivered water meets or surpasses all state and federal drinking water standards. Because treatment to remove specific contaminants can be more costly than measures to protect water at the source, Metropolitan also actively supports improved watershed protection programs for its source waters in the Colorado River and SWP. For the Annual Assessment, any known issues related to water quality will be considered for their potential effects on water supply reliability.

A.4.4. Shortage Levels and Shortage Response Actions

Six Standard Water Shortage Levels

As required by California Water Code Section 10632(a)(3)(A), the WSCP is framed around six standard water shortage levels that correspond to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortages. As shown in Table A.4-5, each of the six shortage levels represents an increasing gap between Metropolitan's estimated core supplies and unconstrained demand as determined in the Annual Assessment. As explained above, shortage percentages will be calculated by dividing the difference between core supplies and unconstrained demand by unconstrained demand. This calculation will be performed separately for anticipated current-year conditions and for assumed dry-year conditions. Shortage levels also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other emergency events. The shortage levels are defined in terms of the percent shortfall of supplies against demands.

Shortage Response Actions

California Water Code Section 10632(a)(4) requires the WSCP to specify shortage response actions that align with the defined shortage levels, and include, at a minimum, all of the following:

- Locally appropriate supply augmentation actions
- Locally appropriate demand reduction actions to adequately respond to shortages
- Locally appropriate operational changes
- Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions (Not applicable to Metropolitan)
- An estimate of the extent to which the gap between supplies and demand will be reduced by implementation of each action.

As indicated in Table A.4-5, shortage responses will be customized to meet the circumstances for the particular shortage. Because circumstances can change at any time, Metropolitan's shortage response actions will be adjusted accordingly throughout the year. To determine specific actions that would be taken at each standard shortage level, Metropolitan will evaluate conditions specific to cost, timing, distribution needs and capabilities, and other variables that include SWP allocation, Colorado River conditions, demand reduction measures, supply program take capacities, and storage balances.

Shortages are characterized not merely by shortfalls in annual core water supplies, but also by the water balances in Metropolitan's storage programs. Thus, a 10 percent shortfall in core supplies could be met entirely with stored water if storage levels are sufficient. If storage levels are already depleted, the same shortfall in core supplies could potentially require a more complex mix of supply augmentation and demand reduction actions. In the most severe situations, shortage allocations to member

agencies through measures such as the WSAP would address any remaining shortages not already mitigated by supply augmentation and lesser demand reduction actions.

Metropolitan has invested extensively in a diverse portfolio of supply sources and system resiliency to prepare for a wide range of possible challenging conditions. Metropolitan follows the principles of its WSDM Plan, which was adopted in 1999 and provides policy guidance for managing regional water supplies to achieve reliability. It identifies a broad sequence of actions during surpluses and shortages to minimize the probability of severe shortages, based on detailed modeling of Metropolitan's existing and expected resource mix. The WSDM Plan recognizes the link between surplus and shortages and integrates planned operational actions with respect to both conditions. The WSDM Plan is included as Attachment A to this document.

Table A.4-5
Shortage Stages and Response Actions

Shortage Stage	Shortage Percentage	Shortage Response	
1	Up to 10%	Take from Storage Execute Flexible Supplies Implement Voluntary Demand Reduction Implement Supply Allocations	• 0 to 100% met by Storage • 0 to 100% met by Flexible Supplies • 0 to 20% of total retail water use met by implementing Communication Plan • 0 to 50% of total base demand met by supply allocation
2	10% to 20%	Take from Storage Execute Flexible Supplies Implement Voluntary Demand Reduction Implement Supply Allocations	• 0 to 100% met by Storage • 0 to 100% met by Flexible Supplies • 0 to 20% of total retail water use met by implementing Communication Plan • 0 to 50% of total base demand met by supply allocation
3	20% to 30%	Take from Storage Execute Flexible Supplies Implement Voluntary Demand Reduction Implement Supply Allocations	• 0 to 100% met by Storage • 0 to 100% met by Flexible Supplies • 0 to 20% of total retail water use met by implementing Communication Plan • 0 to 50% of total base demand met by supply allocation
4	30% to 40%	Take from Storage Execute Flexible Supplies Implement Voluntary Demand Reduction Implement Supply Allocations	• 0 to 100% met by Storage • 0 to 100% met by Flexible Supplies • 0 to 20% of total retail water use met by implementing Communication Plan • 0 to 50% of total base demand met by supply allocation
5	40% to 50%	Take from Storage Execute Flexible Supplies Implement Voluntary Demand Reduction Implement Supply Allocations	• 0 to 100% met by Storage • 0 to 100% met by Flexible Supplies • 0 to 20% of total retail water use met by implementing Communication Plan • 0 to 50% of total base demand met by supply allocation
6	More than 50%	Take from Storage Execute Flexible Supplies Implement Voluntary Demand Reduction Implement Supply Allocations Take from Emergency Storage, if needed	• 0 to 100% met by Storage • 0 to 100% met by Flexible Supplies • 0 to 20% of total retail water use met by implementing Communication Plan • 0 to 50% of total base demand met by supply allocation • Take from emergency storage during a catastrophic event

Supply Augmentation Actions

Generally, Metropolitan's first response to any gap between core supplies and demand is to make optimal use of its supply augmentation options consisting of draws from flexible supply programs and storage reserves listed in Table A.4-6. To supplement its core water supplies from the SWP and Colorado River, Metropolitan has developed and actively manages a portfolio of water supply programs, including water transfer, storage and exchange agreements, the supplies created by which are conveyed through available CRA capacity or the California Aqueduct. Metropolitan pursues voluntary water transfer and exchange programs with other entities to help mitigate supply/demand imbalances and provide additional dry-year supply sources. Metropolitan has also developed significant storage capacity in reservoirs and groundwater banking programs both within and outside of the Southern California region. Actual take capabilities would depend on various factors including water balances, location, and operational constraints.

Flexible Supplies

Metropolitan can augment its core Colorado River supplies through agreements with other agencies that have rights to use such water. Metropolitan determines the delivery schedule of these supplies throughout the year based on changes in the availability of SWP and to a smaller extent the higher priority water use adjustment for Colorado River water.

In addition to the basic SWP contract provisions, Metropolitan has other contract rights that facilitate augmentation of its SWP supply. Each SWP contractor has the right to use the facilities to move water supplies associated with agreements, water transfers, and water exchanges at the incremental cost. Metropolitan utilizes this ability in conveying water obtained through a number of agreements and exchanges with agencies in California's Central Valley, north of the Bay-Delta, and southward to Southern California.

Storage

A key component of Metropolitan's water supply capability is the amount of water in Metropolitan's storage facilities and programs in which surplus amounts of water in normal and wet years are captured until needed to augment core supplies. Metropolitan has developed an extensive storage portfolio made up of units within and outside Metropolitan's service area that includes both dry-year and emergency storage capacity. Such units, totaling approximately 6 MAF, include reservoirs and groundwater storage programs within the service area, and groundwater and surface storage accounts outside the service area delivered through the CRA or SWP. Consistent with the Emergency Storage Objective that was revised in 2019, approximately 750,000 AF of total stored water is emergency storage reserved for use in the event of supply interruptions from earthquakes or similar emergencies.

Table A.4-6
Supply Augmentation Actions: Flexible Supplies and Storage

Source	Flexible Supplies	Storage
Colorado River		Lake Mead Intentionally Created Surplus (ICS) Storage Program Southern Nevada Water Agency Storage and Interstate Release Agreement Desert Water Agency/Coachella Valley Water District Advanced Delivery Account Imperial Irrigation District Storage
State Water Project	SWP Transfers San Bernardino Valley Municipal Water District Program	SWP Carryover DWR Flexible Storage (Castaic Lake and Lake Perris) SWP Banking Programs
In-Region		Diamond Valley Lake Lake Mathews Lake Skinner Conjunctive Use Programs (CUP)

Demand Reduction Actions

Demand reduction actions are extraordinary measures taken to temporarily constrain water demand during a shortage. For the purpose of the WSCP and the Annual Assessment, it is important to separate temporary reductions in demand from baseline conservation as they relate to constrained and unconstrained demands. WSCP demand reduction actions result in constrained demands. Water savings from WSCP demand reduction actions must be factored into estimates of unconstrained demands for Annual Assessment shortage determinations. Intensity of demand reduction measures will vary by the severity of shortage and availability of other cost-effective supply augmentation measures. Early demand reduction actions tend to be voluntary measures that are comprised of outreach and education actions from Metropolitan's WSCP Communication Plan (see following section A.4.5). More severe conditions may necessitate supply allocations to wholesale customers through measures such as the WSAP. Table A.4-7 shows the demand reduction measures available to Metropolitan.

Table A.4-7
Demand Reduction Actions

	Demand Reduction Actions
Voluntary Measures	Implement Communication Plan (May apply to Shortage Levels 1-6, Crisis) • Public information campaigns • Community outreach and media relations • Public opinion research • Interagency and intergovernmental coordination
Mandatory Measures	Implement supply allocation (May apply to Shortage Levels 1-6, Crisis)

Benefits of public information campaigns include rapid implementation and raising public awareness of the severity of the water shortage. For this reason, public information campaigns are included as a Demand Reduction Action in the WSCP. According to the American Water Works Association, water savings from this measure alone range from 5 to 20 percent, depending on the time, money, and effort spent.[2] If public outreach targets between 5 and 10 percent of the population, then demand would be assumed to be reduced by 5 to 20 percent of the 5 to 10 percent. The size of the media campaign is correlated with the number of people being reached.

Implement Communications Plan

Metropolitan's WSCP Communication Plan details Metropolitan's action-oriented strategy for education, outreach, and coordination during each WSCP standard shortage stage and in response to a catastrophic loss of supply. See the following section A.4.5 for the WSCP Communications Plan.

Enhanced Conservation Program

Although not considered as a WSCP demand reduction action because of their limited effect in the immediate term, Metropolitan administers regional conservation programs and co-funds member agency conservation programs designed to achieve greater water use efficiency in residential, commercial, industrial, institutional, and landscape uses. Metropolitan may implement extraordinary measures to temporarily enhance conservation during a shortage which include, but are not limited to, increasing rebates, reducing program eligibility requirements, working with rebate vendors to create in-store marketing and direct outreach to businesses, increasing direct install efforts with member agencies and partners, and working with water retailers and retail customers to develop on-site leak prevention programs. While the savings from conservation programs may not be realized quickly enough to mitigate the need for other shortage response actions, water-efficient device retrofit rebates, landscape conversions, and leak prevention all contribute to ongoing structural water savings. Conservation device

[2] American Water Works Association. 2019. Manual of Water Supply Practices – M60, Second Edition: Drought Preparedness and Response. p. 35

retrofits help to recover storage in future years by lowering demands in all years, not only shortage years.

Water Supply Allocation Plan

Under most conditions, Metropolitan can meet all of its service area's wholesale water needs. However, during severe water shortage situations when public information campaigns and enhanced conservation programs are insufficient to generate the needed demand reduction, Metropolitan may find it necessary to temporarily limit and allocate supplies to its member agencies. Metropolitan's WSAP allocates Metropolitan's water supplies among its member agencies, based on the principles contained in the WSDM Plan, to mitigate drawdowns from water storage reserves. The WSAP was originally approved by Metropolitan's Board in February 2008 and has been implemented three times since its adoption, most recently in April 2015. The WSAP provides a formula for equitable distribution of limited water supplies. If needed, a WSAP action is typically considered for Board approval in the month of April, with implementation beginning in the following July. This allows Metropolitan's member agencies time to prepare and to adjust their estimates for Metropolitan's current year supply for their own WSCP Annual Assessments.

The WSAP allocation is a costly shortage response action that places acute burdens upon member agencies and the public. Other shortage response actions are generally preferred to the extent practicable. Metropolitan's overall strategy considers WSAP allocations to be a fallback option to address any remaining shortages when supply augmentation actions and other demand management measures are insufficient to meet demand reduction objectives. For reference, the WSAP is included as Attachment B to this document.

Emergency Water Conservation Program

In April 2022, Metropolitan's Board declared a Water Shortage Emergency Condition for Metropolitan's SWP-dependent area and adopted a framework for a new program called the Emergency Water Conservation Program (EWCP). The EWCP preserved supplies by reducing non-essential uses of water delivered to the SWP-dependent area. Six member agencies were affected by the EWCP in 2022, serving approximately six million people. The EWCP began implementation on June 1, 2022, and was authorized through June 30, 2023. The EWCP allowed two paths for compliance involving either enforced restrictions on outdoor watering or adherence to the volumetric limits subject to monetary penalties per acre-feet for using SWP water over the limits. The first compliance path required member agencies to restrict outdoor irrigation to one day per week beginning June 1, 2022. The second path gave member agencies discretion to comply with monthly volumetric limits directly and to tailor their water management responses appropriately to their local circumstances. Due to improved water supply conditions in 2023, the EWCP was rescinded in March 2023.

Operational Changes

During shortage conditions, operations may be affected by supply augmentation or demand reduction responses. For example, Metropolitan may temporarily alter maintenance cycles, defer planned system outages, and adjust the flow and routing of

water through its system to more effectively distribute available supply across the service area, including areas that are currently only able to be served by SWP water supplies.

Because of the extensive and complex nature of Metropolitan's conveyance and distribution system and the varying levels of local supplies available among each of the member agencies, any supply-related shortage response actions triggered under the WSCP would be carefully chosen to optimally match available resources with specific localized demands by the member agencies.

Metropolitan's diversified portfolio of water supplies presents operational opportunities and challenges during droughts. Because water resources available to the Metropolitan service area come from three geographically distinct regions – Northern California, the Colorado River, and local resources – a relatively dry year affecting one of these three regions can be offset by relatively abundant supplies from the other two regions. For example, a year of ample precipitation within Metropolitan's service area tends to depress demand and enhances local water resources, further reducing demands on imported supplies. A wet year in the Sacramento-San Joaquin watersheds increases the SWP allocation, facilitating reduced diversions from the Colorado River in favor of storing supplies in Lake Mead or in the Desert Water Agency/Coachella Valley Water District Advanced Delivery Account. Conversely, a shortfall on the SWP may require system operational modifications to maximize Colorado River diversions and the delivery of Colorado River supplies to areas normally served with SWP supplies.

Additional Mandatory Prohibitions (not applicable)

California Water Code Section 10632(a)(4)(D) calls for "additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions" to be included among the WSCP's shortage response actions. However, this item is not applicable to Metropolitan. As a regional wholesaler, Metropolitan does not dictate or control the end uses of water by retail consumers.

Shortage Response Action Effectiveness

As shown in Table A.4-5, WSCP shortage response actions will be implemented to reflect the overall conditions facing Metropolitan and the resources available in that given year. Supply augmentation actions consisting of stored water and as-needed flexible supplies are expected to address between 0 to 100 percent of anticipated shortages for any shortage stage, depending on availability of those supplies; in lesser WSCP shortage stages, it is likely that shortages can be completely addressed through supply augmentation.

Efficacy of demand reduction efforts is difficult to estimate or predict, but water savings are a function of the extent to which public information campaigns reach water users and the degree of consumer response to those messages. Given the estimate of between 5 to 20 percent effectiveness described above, in concept, up to 20 percent of retail demands could be reduced if a successful media campaign reached and influenced the entire service area population. Consistent with the WSCP Communications Plan in the following section A.4.5, anticipated shortages will involve

an appropriately-sized outreach campaign to address the targeted demand reduction, which depends on the combined effectiveness of other shortage response actions.

As shown in Table A.4-8 below, the WSAP is designed to reduce wholesale demands by up to approximately 50 percent of the WSAP's calculated base demand. The WSAP contains 10 levels of allocation, and each level is approximated to generate an additional 5 percent reduction from base demands. Table A.4-8 gives examples of estimated savings by each WSAP level using a hypothetical base demand of 1.8 MAF. Actual reductions and base demands are based on a formula that includes various factors such as actual local supply production, population growth, and conservation. The WSAP is expected to address the shortage not met by other shortage response actions. In rare cases where system supplies are unable to meet location-specific demands, such as in 2022-2023, when there was insufficient SWP system water to meet SWP-dependent demands, a region-wide allocation through the WSAP may not be appropriate. In such cases, Metropolitan may consider other measures, such as the EWCP, to address the specific problem.

Table A.4-8
Water Supply Allocation Plan Levels

WSAP Level	Approximate Percent Reduction	Example Base Demand	Estimated Demand Reduction
1	5%	1.8 MAF	90,000 AF
2	10%		180,000 AF
3	15%		270,000 AF
4	20%		360,000 AF
5	25%		450,000 AF
6	30%		540,000 AF
7	35%		630,000 AF
8	40%		720,000 AF
9	45%		810,000 AF
10	50%		900,000 AF

Catastrophic Interruption of Water Supplies

Metropolitan's Emergency Storage Objective is a planning estimate that represents the amount of water that Metropolitan would hold in storage for the region in preparation for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California, including: the Colorado River Aqueduct, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct. Emergency storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service.

The Emergency Storage Objective considers a six- and twelve-month outage period for the imported supply aqueducts incorporating latest seismic information and operational

flexibility of Metropolitan's system, a retail water demand cutback ranging from 25 to 35 percent considering the level of conservation that the region achieved during the recent drought, and an aggregated loss of 10 to 20 percent of local supplies accounting for factors that could affect local production during emergency conditions.

In 2019, Metropolitan and its member agencies completed a process to update the Emergency Storage Objective, which was set at 750,000 AF. This level of storage would prevent severe water shortages to the region given new information on expected recovery durations. The emergency storage volume represents a planning estimate for how much water Metropolitan would store for the region in preparation for a catastrophic earthquake or other disaster. It is not intended to set a basis or a policy for allocating or apportioning storage for any individual member agency.

As an additional tool, in July 2019, the Board adopted amendments to Metropolitan's Administrative Code enabling deliveries of member agency water supplies in Metropolitan's system in an emergency. These deliveries are intended to provide Metropolitan's member agencies the ability to deliver member agency water through Metropolitan's system under specific emergency conditions. Emergency deliveries can only be made if Metropolitan is unable to make deliveries to a member agency due to physical damage to Metropolitan's system resulting from a natural disaster or other emergency, and there are no alternate means for Metropolitan or the member agency to provide service to an area without the use of a portion of Metropolitan's system.

Metropolitan's strategy for catastrophic water shortage conditions is further discussed in Appendix 7 to the 2025 UWMP and incorporated herein by reference.

Emergency Freshwater Pathway (Sacramento-San Joaquin Delta)

DWR has estimated that in the event of a major earthquake in or near the Delta, water supplies could be interrupted for up to three years, posing a significant and unacceptable risk to the California business economy. A post-event strategy would provide the necessary water supply protections to avert this catastrophe. Such a plan has been coordinated through DWR, the Army Corps of Engineers, USBR, California Office of Emergency Services, Metropolitan, and the State Water Contractors. Additional information on the creation of an emergency freshwater pathway and other actions in the Delta is included in Section 2.5 of the 2025 UWMP and incorporated herein by reference.

Emergency Response Plans

Metropolitan maintains an Emergency Response Plan (ERP) that meets the requirements of the American Water Infrastructure Act of 2018. This plan was certified with the Environment Protection Agency (EPA) in 2019, and it was certified again in September 2025. The ERP is updated periodically and provides guidance on how Metropolitan activates and operates its Emergency Operations Center (EOC), Incident Command Posts (ICPs) and Duty Officer program. Metropolitan's EOC follows the Standardized Emergency Management System (SEMS) model, and the ICPs use the Incident Command System (ICS) to manage local incident responses. The plan utilizes a multi-hazard approach and provides a strategy for various types of incidents. The plan

also includes coordination with outside jurisdictions such as other utilities, cities, counties, state and federal governments.

Seismic Risk Assessment and Mitigation Plan

CWC Section 10632.5 mandates UWMPs to include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. For Metropolitan, the required assessment and plan are accomplished as part of developing its resilience strategy and are presented in detail in its seismic resiliency reports. This section provides a summary of the various components of Metropolitan's resilience strategy. These components are described in detail in Metropolitan's Seismic Resilience Report First Biennial Report (February 2018) and subsequent updates in 2020 and 2025.

Over its nearly 100-year history, Metropolitan has been proactive in mitigating seismic risks posed to its expansive infrastructure, as well as improving its ability to maintain (or quickly restore) water deliveries following a major earthquake. This ability to mitigate seismic risks and maintain (or quickly restore) water deliveries following a seismic event is referred to as "seismic resilience." Metropolitan's holistic strategy for seismic resilience follows a "defense in depth" multi-layered approach for managing risk. Metropolitan's Seismic Resilience Strategy has three primary objectives:

1. Provide a diversified water supply portfolio, system flexibility, and emergency storage
2. Prevent damage to water delivery infrastructure in probable seismic events and limit damage in extreme events
3. Minimize water delivery interruptions through a dedicated emergency response and recovery organization

Metropolitan's Seismic Resilience Strategy is implemented through four components that encompass the various internal functions that promote Metropolitan's seismic resilience objectives. These components are supplemented by Metropolitan's commitment to inter-agency coordination when preparing and responding to a seismic event and other emergencies.

A.4.5. WSCP Communications Plan

Introduction

From 2020 to 2025, extreme swings in hydrologic conditions were driven by a rapidly changing climate and increasingly unpredictable weather patterns. Metropolitan concentrated on building its conservation and outreach program to emphasize sustained efficiency while celebrating the remarkable water-saving achievements accomplished throughout the region. Messaging has encouraged sustainable, long-term behavioral changes, particularly with regard to outdoor water use. These efforts have helped solidify a conservation ethic across Southern California, supporting a $1.7 billion investment in conservation, recycling and groundwater recovery since 1990. When combined with additional investments in storage, local supply development, and system flexibility, the region is well positioned to withstand future droughts. Still, in response to the challenges of climate change and other adverse supply conditions, increased water

efficiency remains a critical strategy. As those extreme conditions become more prevalent, effective communication strategies and a common understanding of necessary actions between water agencies, the public, elected officials, and other key stakeholders become even more important. These relationships and communication tools must be well established to be successful. To that end, water providers should aim to communicate to customers in the following areas:

1. Actions water providers are taking to plan for and respond to emergency situations – including drought, infrastructure failures, earthquakes, wildfires, and other natural or manmade disasters.
2. Ongoing investments to maintain and upgrade critical infrastructure – to increase resilience, reliability, and flexibility.
3. Status of regional water supply conditions and triggers for WSCP shortage response actions – so customers understand the "why" between critical conservation actions.
4. Where customers can go for updates and reliable information during a water emergency – including websites, social media, hotlines, and community alert systems.

Several factors influence the strategies needed to effectively communicate with the diverse communities and needs of Metropolitan's 5,200 square-mile service area, particularly when there is an urgent need for conservation. As a wholesaler serving 26 member agencies and a region that is home to nearly 19 million people, there is no single communication message or strategy that will effectively reach Metropolitan's diverse audiences. Furthermore, state and local water regulations during periods of drought or supply shortages can result in a broad range of water-saving requirements and goals across the region. Qualitative research from previous droughts has provided valuable insight on attitudes and behaviors toward water conservation, including drought fatigue, water quality concerns, increasing water rates and equity issues. These factors, though inherently complex, are conducive to collaboration that elevates the importance of drought resiliency. This section of the WSCP describes the basic communications strategies needed to help Metropolitan effectively communicate vital information for each of the six standard water shortage levels that represent changes from normal reliability. The six standard water shortage levels depicted in this communications plan correspond to progressively increasing estimated shortage conditions: up to 10, 20, 30, 40, 50, and greater than 50 percent shortage compared to the normal reliability conditions.

Collaboration

Collaboration with its member agencies is central to Metropolitan's outreach plans during drought, water shortages or other demand management periods. Developing and delivering a concise regional message in multiple languages is made possible through consistent coordination with member agencies and their constituents. Metropolitan's External Affairs group regularly engages and interacts with member agency staff in several capacities, including but not limited to the following groups:

- Member agency managers

- Legislative and government affairs representatives
- Water use efficiency/conservation coordinators
- Public information officers
- Education coordinators

In addition to member agency coordination, Metropolitan interacts with agencies and organizations outside of the region, including:

- Department of Water Resources
- State Water Resources Control Board
- Association of California Water Agencies
- California Municipal Utilities Association
- Colorado River Water Users Association
- California Water Efficiency Partnership
- Alliance for Water Efficiency
- Law enforcement and public safety agencies
- Other state and federal agencies

As seen in past droughts, the methods of communication within these groups and the frequency of meetings fluctuate based on the changing needs of our member agencies and their key audiences. Water shortage conditions are ever-evolving—remaining flexible yet focused not only reduces the risk of discordance, but it also ensures key audiences throughout Southern California receive timely, valuable, and cohesive information.

As mentioned, Metropolitan's WSCP includes six levels of potential shortage. The water-saving actions associated with each level of shortage will vary greatly. This section provides an overview of messaging strategies that would be enacted at each level, leading to more focused crisis communication strategies. This plan is adaptable and should be tailored for the needs of each situation. Metropolitan management and/or Board of Directors could also call for specific messaging strategies that address unique shortage scenarios.

Key Audiences

Communicating to stakeholders is essential during normal supply periods and becomes increasingly important during water shortages. Below is a list of key audiences:

- Metropolitan Board
- Metropolitan employees
- Member agencies and their customers
- General public
- State, federal, and local elected officials and their district office staff

- Homeowners and renters
- Multi-family property owners/managers/landlords
- Business associations/chambers of commerce
- Commercial-industrial property owners/managers
- Landscape contractors/suppliers
- Restaurant/hotel industries
- School districts/educators/students
- Building and construction trade associations
- Community/civic leaders
- Land-use agencies
- Environmental groups
- Community-based and non-profit organizations
- Non-English-speaking populations
- Disadvantaged/under-invested communities

Communicating to these audiences requires varying levels of involvement depending on the status of supply conditions. Feedback, research, and leveraging existing relationships are central to an effective communications plan; therefore, Metropolitan's External Affairs and Water Resource Management staff will continue to coordinate closely with member agencies, stakeholders, and governing agencies on an ongoing basis to ensure appropriate messaging is culturally competent and provided in multiple languages to reflect the region's demographics.

Goals and Objectives

Metropolitan's communications goals are rooted in the following guiding principles:

- Motivate key audiences to:
    - Increase conservation
    - Follow voluntary or mandatory water use guidelines
    - Participate in water-saving incentive programs
    - Encourage family, friends, neighbors, and colleagues to do all the above
- Raise awareness about:
    - Water shortage and/or drought conditions
    - Water sources, supplies, and reserves
    - Local, regional, and state regulations

- Educate key audiences on:
    - Water supply reliability
    - Water infrastructure and delivery
    - Water quality
- Prepare the region for:
    - Varying water supply conditions
    - Escalating supply shortage levels

Standard Communication

Conservation as a way of life remains central to messaging during normal supply conditions. Regional rebate programs, indoor and outdoor water use efficiency, investments to maintain infrastructure, emergency preparedness, local supply programs, water quality, and regional supply reliability are among some of the themes that make up a normal supply period's communications mix to encourage ongoing conservation actions. Below are Metropolitan's communications tools:

- Media relations (news releases and advisories, interviews, op-eds)
- Social media (X, Instagram, Facebook, YouTube, LinkedIn)
- Websites and Blogs
    - mwdh2o.com
    - bewaterwise.com
    - socalwatersmart.com
- Digital, print, and other paid media marketing
- Search engine optimization
- E-newsletters
- Community events
- Education outreach
- Business outreach

Level 1 Communications – up to 10 percent Shortage

This section addresses the communications strategies Metropolitan uses during periods of up to 10 percent water shortage conditions in addition to Metropolitan's ongoing communications efforts:

- Media relations and communications
    - Maintain media relations activities with enhanced communication about the specific need to conserve; provide media with regional water supply conditions and Metropolitan's shortage response action updates:

        - Press releases, advisories, op-eds, and direct outreach to media to drive earned media opportunities
        - Ethnic media outreach in multiple languages
        - Produce and distribute fact-based informational materials such as fact sheets, podcasts, and B-roll video
- Social media
    - Emphasize ways to conserve immediately (shorter showers, less watering, links to tools on bewaterwise.com, etc.), as well as continued promotion of conservation as a way of life initiatives such as regional water use efficiency incentives and other rebate programs, including Metropolitan's Turf Replacement Program:
        - Paid social media boosting to target the Metropolitan's service area
    - Encourage member agency co-branding and messaging continuity:
        - Share social media creative with the Public Information Officer Working Group and conservation coordinators
- Web
    - Establish a SharePoint site for member agencies and the public to download all water supply and conservation materials
    - Update all Metropolitan websites with pertinent conservation and water supply information
    - Provide links to local watering restrictions and conservation efforts
- Member agency coordination
    - Enhance collaboration and communication with member agencies to streamline messaging
    - Involve member agencies in the development of a communications plan
    - Provide regular campaign updates to member agency managers, staff, and board members
    - Provide member agencies with campaign outreach materials (newsletter articles, creative design, bill inserts, etc.) for customization and distribution
- Community outreach
    - Make water supply conditions and conservation messaging a key component of all regular community outreach
    - Conduct additional, specialized outreach to inform non-profit organizations and civic/community leaders about water supply conditions and conservation efforts
        - Community events/webinars
        - Non-profit organization e-newsletters

- Education outreach
    - Update curriculum to reflect the enhanced need to conserve and make water supply conditions and conservation messaging a key component
    - Communicate to K-12 school districts and colleges/universities about the need for increased conservation
    - Provide regional water and environmental education programs with materials addressing the need for increased conservation
- Legislative and government affairs
    - Promote understanding with local, state, and other elected officials in the region about the need to conserve
    - Encourage officials to promote these efforts to constituents

In addition:

- Regularly communicate with the Metropolitan board and employees so they are aware of how Metropolitan is responding and what they can do to support messaging efforts
- Work with member agencies to target key industries or groups to raise awareness about water-use efficiency programs and regional water supply conditions
    - Restaurants
    - Hotels/motels
    - Public agencies
- Research and public opinion
    - Conduct research to gain insights on public opinion, attitudes and beliefs toward conservation and water shortage levels
    - Message testing with key audiences

Level 2 Communications – up to 20 percent Shortage

In a more severe supply shortage or demand management period, Metropolitan will continue actions outlined in Level 1 communications strategies, and add the following efforts, which are designed to address a shortage condition of up to 20 percent under the WSCP:

- Media relations and communications
    - Paid advertising – Execute a multimedia, multilingual regional advertising campaign to reflect a more urgent message emphasizing the need for compliance with mandatory water-use restrictions. Place paid advertisements in the following platforms:
        - Out of Home (billboards, bulletins, bus shelter ads)
        - Radio

        - Television
        - Digital
        - Grassroots
    - Host a press conference to discuss current water shortage conditions, shortage response actions, and outlook
    - Coordinate with other regional or state agencies for greater impact and reach
- Social media
    - Emphasize a clear and practical message conveying mandatory water-use restrictions, drought conditions, and ways to save water
    - Establish more targeted and focused social media advertising strategies – targeted boosting and messaging
- Member agency coordination
    - Meet with member agencies to streamline a more urgent and serious campaign tone
    - Coordinate paid media flights with member agencies to leverage regional exposure and distribution
    - Provide multimedia and multilingual campaign materials for member agency customization
- Community outreach
    - Coordinate with community-based organizations and leaders with higher impact, reach, and credibility
    - Inform, debrief, and prepare community/civic leaders to become water conservation ambassadors in their respective communities
- Legislative and government affairs
    - Increase briefing activity with state and local officials on water supply conditions, shortage response actions, and water conservation advertising campaign

In addition:

- Help prepare and distribute materials about restrictions, ordinances, and guidelines through stakeholder communication channels, including but not limited to:
    - Business organizations
    - Civic organizations
    - Elected officials
    - Building/plumbing/construction associations

  - Building managers
  - Landscape contractors
- Increase outreach efforts to key associations and interest groups throughout the region, emphasizing immediate conservation goals

Level 3 and 4 Communications – up to 30 percent or 40 percent Shortage

In addition to Level 2 communications strategies, the following efforts will address an even more severe shortage of up to 40 percent under the WSCP:

- Media relations and communications
  - Increase media relations activities, with an added emphasis on the severe regional water supply conditions, the shortage response actions triggered or expected to be triggered, and the mandatory need to conserve
  - Host news conference in multiple languages alongside high-level public officials to highlight severity and extreme measures needed
  - Continue the following with greater frequency and stronger, more critical messaging:
    - Paid advertising campaign
    - Press releases, advisories, op-eds, etc.
    - Direct media outreach offering pre-recorded radio and TV interviews
    - Ethnic media outreach in multiple languages
- Social media
  - Messaging shift to reflect severity of supply conditions and shortage response actions triggered or expected to be triggered– conservation is mandatory to maintain day-to-day activity and future supplies, quality of life now being impacted
- Web
  - Make conservation messaging front and center on all websites
- Community Outreach
  - Host a community leader briefing, bringing together representatives from community-based organizations from across the region to learn about the severity of water supply conditions
- Member agency coordination
  - Continue to streamline messaging about WSCP level escalation to ensure message continuity throughout the region
  - Help member agencies address local and mandatory conservation needs
  - Coordinate with member agencies on any updated messages and campaign activities emphasizing extreme actions that must be taken

- Legislative and government affairs
    - Outreach to legislative leadership at state and federal level to raise awareness at high levels

In addition:

- Specialized targeted outreach to:
    - Special interest groups
    - Public agencies
    - County and city departments
- Assess the goals and objectives of regional rebate programs, begin a shift toward immediate water-saving actions
- Research and public opinion
    - Conduct public opinion research studies including focus groups to determine attitudes and beliefs toward extreme conservation levels to effectively communicate severity of supply conditions and the mandatory need to conserve

Level 5-6 Communications – 50 percent Shortage or more

The severity of this level of the WSCP calls for immediate, extreme conservation measures, and a focus on water use for health and safety only. As with previous levels, communications strategies at this level of the WSCP incorporate and build upon ongoing efforts.

Key Communications Strategies

- Consider establishing a Joint Information Center (JIC) to pool crisis communications among emergency responders and affected local, state, and federal agencies
- Consider hosting employee town halls to provide updates on the situation
- Produce and distribute fact-based informational materials such as fact sheets, podcasts, and B-roll video
- Host a press conference to announce the severity of water shortage level and shortage response actions triggered or anticipated to be triggered, in conjunction with regional and/or state emergency response and public health authorities
- Emphasize work being done by Metropolitan and its member agencies to alleviate the impacts of such a severe shortage
- Focus on the need for residential and commercial customers across the region to do their part to get through the crisis situation
- Offer vulnerable populations increased assistance, in coordination with regional emergency response teams

- Keep the media and key stakeholders informed with frequent supply condition reports
- Shift from traditional advertising campaign efforts to emergency and crisis communication approach
- Messaging is no longer conservation-focused, begin shift to crisis response communications protocols

Crisis Communications – Catastrophic Shortage

In the event of a catastrophic shortage due to an infrastructure failure and/or natural disaster, Metropolitan will enact its crisis communications plan in accordance with local, regional, state, and federal emergency response guidelines that ensure a coordinated effort and effective response. This plan utilizes the Standard Emergency Management System, the Incident Command System and the National Incident Management System.

Strategic Message Development

In an emergency, communications messages will be created in a complex environment in which the tensions of multidirectional information flows must be balanced with the need for strategic message development.

Message Dissemination

Communication efforts will center on the core identified tasks: providing information to the public and external audiences. Information dissemination tools include:

- Website (mwdh2o.com, bewaterwise.com)
- Social Media (X, Facebook, Instagram, YouTube)
- MetAlert Emergency Notification System + RSS Feeds
- Internal memos to the workforce
- Press Releases and statements
- Participation in joint information centers
- For localized emergencies: community bulletin boards, NextDoor

Information Dissemination

- Public Information
    - Activate and manage the mechanisms for responding to public requests for information via social media, telephone, in writing, or by e-mail
    - Prepare Metropolitan's telephone operators for responding to and monitoring calls related to emergency incidents; brief them and provide scripts on how to respond to questions and where to direct calls for other requests
    - Respond to media inquiries and prepare subject matter experts to participate in media interviews and press conferences

- Monitor news media and work with editors/producers to correct any inaccuracies, as necessary
- Work with subject matter experts to create situation-specific talking points, fact sheets, Q&A documents, and updates
- Respond to requests and inquiries from special interest groups
- Oversee and manage Metropolitan's emergency response website if needed, in addition to mwdh2o.com, social media, telephone, and public email correspondence response systems; establish and maintain links to other emergency response websites
- Manage the development and testing of messages and materials for cultural and language requirements of special populations
- Post updates on social media channels. Monitor and respond to comments as needed/appropriate

- Member agencies, partnering agencies, and elected/legislative officials
  - The Public Information Officer (PIO) or Crisis Communications Team will communicate, as needed, with the PIOs for member agencies and other partnering agencies
  - Help organize and facilitate official meetings and briefings to provide information and receive input from member agencies, other partners, or stakeholders
  - Notify legislative/elected officials as needed

A.4.6. Legal Authorities

This section describes the legal authorities that empower Metropolitan to implement and enforce its shortage response actions. Metropolitan is a wholesale water provider organized as a cooperative of 26 voluntary members. Metropolitan was formed pursuant to the Metropolitan Water District Act, Statutes 1969, chapter 209, as amended, codified at California Water Code, Appendix Section 109 (the "MWD Act"). Pursuant to the MWD Act, Metropolitan has the express and implied statutory authority to "[p]rovide, sell, and deliver water at wholesale for municipal and domestic uses and purposes," among other powers. (MWD Act, §§ 120, 130.) To accomplish the provision of water, Metropolitan is also expressly authorized to promote and implement conservation programs, including during times of water shortage. (MWD Act, § 130.5.)

Metropolitan also has authority under the California Water Code to implement supply shortage programs. (Cal. Water Code, §§ 350-359, 375-378.) For example, Section 375(a) of the Water Code provides:

> *Notwithstanding any other provision of the law, any public entity which supplies water at retail or wholesale for the benefit of persons within the service area or area of jurisdiction of the public entity may, by ordinance or resolution adopted by a majority of the members of the governing body after holding a public hearing upon notice and making appropriate findings of necessity for the adoption of a water conservation program, adopt and enforce a water conservation program to reduce the quantity of water used by those persons for the purpose of conserving the water supplies of the public entity.*

Cal. Water Code, § 375(a). Water Code Section 375(b) also provides the authority for pricing to encourage water conservation.

> *With regard to water delivered for other than agricultural uses, the ordinance or resolution may specifically require the installation of water-saving devices that are designed to reduce water consumption. The ordinance or resolution may also encourage water conservation through rate structure design.*

Metropolitan's Board of Directors has approved many policies and rules, codified in Metropolitan's own Administrative Code, which further provide Metropolitan the authority to ensure the availability of its water during times of shortages. For example, Administrative Code Section 3107 requires that any territory annexed to Metropolitan comply with Metropolitan's water use efficiency guidelines.

The Board has also ratified various policies and rules to implement a Water Supply Allocation Plan (WSAP) to address shortage conditions. Metropolitan's WSAP provides a standardized methodology for allocating supplies during times of shortage. The WSAP is authorized pursuant to the following Board actions:

- By Minute Item 43514, dated April 13, 1999, the Board adopted the WSDM Plan.
- By Minute Item 44005, dated June 17, 2000, the General Manager has the authority to reduce Interim Agriculture Water Program deliveries up to 30 percent prior to imposing any mandatory allocation under the WSDM Plan.
- By Minute Item 47393, dated February 12, 2008, the Board adopted the WSAP.

- By Minute Item 48376, dated August 17, 2010, the Board approved adjustments to the WSAP.
- By Minute Item 48803, dated September 12, 2011, the Board approved adjustments to the WSAP.
- By Minute Item 74526, dated February 11, 2014, the Board adopted the Water Supply Alert Resolution.
- By Minute Item 49979, dated December 9, 2014, the Board approved adjustments to the WSAP.
- By Minute Item 52802, dated April 26, 2022, the Board declared a Water Shortage Emergency Condition, authorized the Emergency Water Conservation Program, and expressed support for the Governor's Executive Order N-7-2.
- By Minute Item 52946, dated August 16, 2022, the Board adopted a resolution committing to regional reliability for all member agencies.

In addition to the statutes and other legal authorities set forth above, Metropolitan is empowered to implement and enforce its shortage response actions pursuant to various resolutions. For example, on May 11, 2021, Metropolitan's Board voted to adopt Metropolitan's 2020 UWMP and authorized its submittal to the State of California as stated in Resolution 9279. Metropolitan's 2020 UWMP contains Metropolitan's December 2014 WSAP in Appendix 4. Metropolitan's 2020 UWMP also describes in Section 2.4 Metropolitan's WSAP and WSDM Plan, which guides Metropolitan's planning and operations during both shortage and surplus conditions. Similarly, on May XX, 2026, Metropolitan's Board voted to adopt Metropolitan's UWMP and this WSCP as stated in Resolutions XXXX and XXXX, respectively. These two Resolutions authorize Metropolitan to implement and enforce its shortage response actions contained in the WSCP, which was attached as Appendix 4 to the 2025 UWMP.

Additionally, numerous agreements allow Metropolitan to take its core supplies and shortage response actions. Core supplies and supply augmentation actions are authorized by the agreements shown in 2025 UWMP Appendix 3: Justifications for Supply Projections, which include:

Colorado River Supplies

- 1931 Seven Party Agreement dated August 18, 1931
- Metropolitan's 1930, 1931, and 1946 water delivery contracts with the Secretary of the Interior
- Consolidated Decree of the Supreme Court of the United States in *Arizona v. California*
- 2003 Quantification Settlement Agreement (QSA) and related agreements
- 2005 Settlement Agreement with the Quechan Indian Tribe
- 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead

- 1988 IID-Metropolitan Conservation and Use of Conserved Water Agreement
    - 1989 Approval Agreement
    - 1989 Supplemental Approval Agreement
- August 2004 Forbearance and Fallowing Program Agreement with PVID
    - Landowner Agreements for Fallowing in PVID
- 2003 Delivery and Exchange Agreement between Metropolitan and Coachella Valley Water District
- 2004 Storage and Interstate Release Agreement among Metropolitan, the Colorado River Commission of Nevada, Southern Nevada Water Authority, and the United States
- 2007 Lower Colorado Water Supply Project Contract among the United States, the City of Needles, and Metropolitan
- 2007 Lower Colorado River Basin Intentionally Created Surplus Forbearance Agreement among the Arizona Department of Water Resources, PVID, IID, the City of Needles, CVWD, Metropolitan, SNWA, and the Colorado River Commission of Nevada
- 2007 California Agreement for the Creation and Delivery of Extraordinary Conservation Intentionally Created Surplus among Metropolitan, PVID, IID, CVWD, and the City of Needles
- 2007 Agreement among the United States, the Colorado River Commission of Nevada, and the SNWA for the Funding and Construction of the Lower Colorado River Drop 2 Storage Reservoir Project
- 2007 Delivery Agreement between the United States and Metropolitan
- 2008 Metropolitan Notice of Election to Participate as a Party to the Drop 2 Funding Agreement
- 2009 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, and the Central Arizona Water Conservation District for a Pilot Project for Operation of the Yuma Desalting Plant
- 2010 Yuma Desalting Plant Pilot Project Delivery Agreement between the United States and Metropolitan
- 2012 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, and the Central Arizona Water Conservation District for a Pilot Program for the Conversion of Intentionally Created Mexican Allocation to Intentionally Created Surplus
- 2012 Interim Operating Agreement for Implementation of Minute No. 319 of the International Boundary and Water Commission
- 2012 Lower Colorado River Basin Forbearance Agreement for Binational Intentionally Created Surplus

- 2012 Binational ICS Delivery Agreement
- 2013 Agreement between Metropolitan and IID Regarding Binational Intentionally Created Surplus
- 2015 Amendment 1 to the California Agreement for the Creation and Delivery of Extraordinary Conservation Intentionally Created Surplus
- 2017 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, IID, and the Central Arizona Water Conservation District for a Pilot Program for the Conversion of Mexico's Water Reserve to Binational ICS
- 2017 Interim Operating Agreement for Implementation of Minute No. 323
- 2017 Binational ICS Agreement
- 2017 Binational ICS Delivery Agreement
- 2019 Lower Basin Drought Contingency Plan
- December 2021 Agreement for the Implementation of a Pilot Seasonal Land Fallowing Program with the Quechan Indian Tribe of the Fort Yuma Indian Reservation.
    - Agreements for Seasonal Fallowing on Tribe-leased lands (Farmer Fallowing Agreements for the Quechan Pilot)
- December 2023 First Amendment to the Agreement for the Implementation of a Pilot Seasonal Land Fallowing Program with the Quechan Indian Tribe of the Fort Yuma Indian Reservation.
- Agreement Relating to Supplemental Water among The Metropolitan Water District of Southern California, the San Luis Rey Settlement Parties, and the United States
- 2003 Amended and Restated Agreement between The Metropolitan Water District of Southern California and the San Diego County Water Authority for the Exchange of Water.
- 1998 Agreement between Imperial Irrigation District and San Diego County Water Authority for Transfer of Conserved Water.
- 2003 Allocation Agreement among the United States, CVWD, IID, SDCWA, Metropolitan, and the San Luis Rey Settlement Parties.
- 2003 Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement.

State Water Project Supplies

- 1960 Contract between the State of California and The Metropolitan Water District of Southern California for a Water Supply
- Port Hueneme Water Agency Annexation: By Minute Item 41728, dated January 9, 1996, Metropolitan's Board adopted Resolution 8487 granting the concurrent annexation of Annexation No. 32 to Calleguas Municipal Water District and The

Metropolitan Water District of Southern California, and fixing Metropolitan's terms and conditions for the annexation

- 1996 Sublease Agreement between the Port Hueneme Water Agency and Metropolitan
- 1967 and 1983 Water Exchange Contract and Agreements with Desert Water Agency and Coachella Valley Water District
- 1984 Advance Delivery Agreement with Desert Water Agency and Coachella Valley Water District
- The 2003 Exchange Agreement with Desert Water Agency and Coachella Valley Water District
- November 2012 Letter Agreement with Coachella Valley Water District
- 2019 Amended and Restated Agreement for Exchange and Advance Delivery with Desert Water Agency and Coachella Valley Water District
- 1997 Arvin-Edison/Metropolitan Water Management Agreement
- 1998 Turn-in/out Construction and Maintenance Agreement between DWR, Kern County Water Agency, Arvin-Edison, and Metropolitan
- 1998-2002 Water Delivery and Return Agreements with DWR, Kern County Water Agency, Arvin-Edison, and Metropolitan
- 2004 Point of Delivery Agreement with DWR, Kern County Water Agency, and Metropolitan
- 2004 Introduction of Water into the California Aqueduct with DWR, Kern County Water Agency, and Arvin-Edison
- 2007 First Amended and Restated Agreement Between Arvin-Edison Water Storage District and The Metropolitan Water District of Southern California for a Water Management Program
- 2000 Coordinated Operating Agreement between Metropolitan and San Bernardino Valley Municipal Water District
- 2001 Coordinated Operating Agreement between Metropolitan and San Bernardino Valley Municipal Water District
- 2019 Board Approval of the High Desert Water Bank Agreement with Antelope Valley East Kern Water Agency
- 2001 Kern Delta/Metropolitan Principles of Agreement
- 2002 Kern Delta and Metropolitan Boards of Directors Approval
- 2007 DWR-Yuba County Water Agency Purchase Agreement
- 2007 DWR-Metropolitan Yuba Dry Year Program Participation Agreement
- 2014 Amended DWR-Metropolitan Yuba Dry Year Program Participation Agreement

- 2019 Amended and Restated Agreement Among The Metropolitan Water District of Southern California, Coachella Valley Water District, and Desert Water Agency for the Exchange and Advance Delivery of Water
- 2020 Amended DWR-Metropolitan Yuba Dry Year Program Participation Agreement
- 2021 Coordinated Operating Agreement. The Coordinated Operating Agreement between Metropolitan and San Bernardino Valley District was approved by Metropolitan's Board in March 2021. The agreement will terminate on December 31, 2035 unless there is an extension of the SWP Contract.
- 2026 Amended DWR-Metropolitan Yuba Dry Year Program Participation Agreement

In-Region Storage and Supplies

- November 1974 Memorandum of Understanding and Agreement on Operation of Lake Skinner
- November 1994 Memorandum of Understanding on Operation of Domenigoni Valley Reservoir (now known as Diamond Valley Lake)
- Elderberry Forebay Contract for Conditions for Use
- June 2002 Division of Safety of Dams Certificate of Approval
- October 1991 Final EIR for the Eastside Reservoir Project (Diamond Valley Lake)
- 1995 amendment to Metropolitan's SWP contract to include Article 54, "Usage of Lakes Castaic and Perris"
- November 1974 Memorandum of Understanding and Agreement on Operation of Lake Skinner
- June 2002 Division of Safety of Dams Certificate of Approval
- Principles for groundwater storage adopted by the Metropolitan Board in January 2000
- Resolution for Proposition 13 Funds adopted by the Metropolitan Board in October 2000
- Agreement executed with the DWR for Interim Water Supply Construction Grant Commitment Safe Drinking Water, Clean Water, Watershed Protection and Flood Protection (Proposition 13, Chapter 9, Article 4) providing for Metropolitan to administer $45 million in state Proposition 13 grant funds for groundwater reliability programs; October 2000
- Agreement executed for Chino Basin Programs, June 2003, amended in May 2004, August 2004, August 2005, May 2008, March 2009, September 2009, July 2010, and January 2015
- Agreement executed for Upper Claremont Basin Groundwater Storage Program, September 2005, amended in April 2008
- Agreement executed for Elsinore Basin Conjunctive Use Program, December 2006, amended in May 2008

These agreements are described in more detail in Appendix 3 to Metropolitan's 2025 UWMP.

If necessary, Metropolitan shall declare a water shortage emergency in accordance with CWC Chapter 3 (commencing with Section 350) of Division 1. In addition, Metropolitan shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

A.4.7. Financial Consequences of and Responses for Drought Conditions

A water shortage may be created by a reduction in water supply, an increase in water demand, or a combination of both. Metropolitan's shortage response actions include supply augmentation, demand management, and operational flexibility, all of which could impact Metropolitan financially. For example, exercising the options to take water from supply augmentation programs may increase costs. Similarly, operational changes could result in higher system costs and lower revenues from on-system hydropower generation, and an increase in conservation and outreach efforts would also increase costs. On the other hand, if core supplies from the SWP or the Colorado River were reduced, variable power costs to move water into the service area would likely decrease. Additionally, effective demand management during shortages tends to decrease Metropolitan's water sales when effective, thereby potentially reducing revenue for Metropolitan. From these various financial effects, there is a potential for expenditures exceeding revenues more than budgeted, thereby requiring unanticipated draws from reserves.

Variation in the amount of revenues is already part of Metropolitan's financial planning. Revenues vary according to regional weather and the availability of statewide water supplies. In dry years, local demands increase, and Metropolitan may receive higher than anticipated revenues due to increased sales volumes. In contrast, in wet years, demands decrease, and revenues drop due to lower sales volumes. In addition, statewide supply shortages such as those in 2009, 2015, and 2022 also affect Metropolitan's revenues. Such revenue surpluses and shortages could cause instability in water rates. To mitigate this risk, Metropolitan maintains financial reserves, with a minimum and target balance, to stabilize water rates during times of reduced water sales. The reserves hold revenues collected during times of high water sales and are used to offset the need for revenues during times of low sales. Metropolitan's practice of using reserves to buffer unexpected increases or decreases in budgeted revenue also applies to unexpected expenditure increases or decreases resulting from shortage responses.

Metropolitan uses its financial reserves to mitigate the impacts of water shortages. This policy applies to each of the six shortage levels described in this WSCP. Financial reserves create a buffer to reduce the financial impact of the water shortage. Other mitigation actions such as reducing operations and maintenance expenses, deferring capital projects, and rates/charges increases are part of Metropolitan's biennial budget and rate design cycle, are not used routinely to mitigate financial impacts of water shortage response actions.

Metropolitan's reserve policy provides for a minimum reserve requirement and target amount of unrestricted reserves at June 30 of each year. Funds in excess of the target amount are to be utilized for capital expenditures in lieu of the issuance of additional debt, or for the redemption, defeasance or purchase of outstanding bonds or commercial paper as determined by the Board. However, if the fixed charge coverage ratio (the amount necessary to cover all fixed costs) is at or above 1.2, amounts over the minimum may be expended for any lawful purpose of Metropolitan, as determined by the Board. Therefore, unrestricted reserves are intended to be available to address

Metropolitan's shortage response actions, as well as the consequences of those actions, so long as its fixed charge coverage ratio is at or above 1.2.

A.4.8. WSCP Adoption and Refinement Procedures

WSCP Public Notice and Adoption

Metropolitan provided notice of the availability of the draft 2025 UWMP (including Appendix 11) and WSCP, and notice of the public hearing to consider adoption of both plans in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The public review drafts of the 2025 UWMP and the WSCP were posted prominently on Metropolitan's website, mwdh2o.com, on February 6, 2026, more than 60 days in advance of the public hearing on April 13, 2026. The notice of availability of the documents was sent to Metropolitan's member agencies, as well as to cities and counties in Metropolitan's service area. In addition, a public notice advertising the public hearing in English and Spanish was published in 11 Southern California newspapers. The notification in English language newspapers was published on February 23, 2026 and March 2, 2026. The notification was published on February 23, 26, 27, 2026 and March 2, 5, 6, 2026 in Spanish language newspapers, satisfying the requirement for non-English language notification. Copies of: (1) the notification letter sent to the member agencies, cities and counties in Metropolitan's service area, and (2) the notice published in the newspapers are included in the 2025 UWMP Section 5. Table 5-3 in the 2025 UWMP provides a list of participating member agencies and other appropriate agencies that Metropolitan coordinated with in its regional planning, as well as the cities and counties that were notified about the preparation of its 2025 UWMP and WSCP. In addition, the list of newspaper publications is included in Table 5-4.

Metropolitan held the public hearing for the draft 2025 UWMP and draft WSCP on April 13, 2026, at the Board's One Water and Adaptation Committee meeting. On May XX, 2026, Metropolitan's Board determined that the 2025 UWMP and the WSCP are consistent with the MWD Act and accurately represent the water resources plan for Metropolitan's service area. In addition, Metropolitan's Board determined that Appendix 11 to both the 2015 UWMP and the 2020 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003) which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in Resolutions XXXX, XXXX, and XXXX, the Board adopted the 2025 UWMP and the WSCP and authorized their submittal to the State of California. Copies of Resolutions XXXX, XXXX, and XXXX are included in the 2025 UWMP Section 5, and Resolution XXXX for the WSCP is attached to this WSCP as Attachment C.

Submission and Availability of 2025 UWMP and WSCP

In fulfillment of CWC Sections 10632(c) and 10645(a) and (b), Metropolitan's final 2025 UWMP and its WSCP were posted on the mwdh2o.com website in May 2026, following their adoption by the Metropolitan board. This satisfies the requirement to make the plans available for public review and to make the WSCP available to Metropolitan's customers (which are its member agencies).

In fulfillment of CWC Sections 10632(c), 10635(c) and 10644(a)(1), Metropolitan also mailed copies of the final 2025 UWMP and WSCP (in electronic pdf format) to the

California State Library and all cities and counties within Metropolitan's service area within 30 days of Board adoption.

In June 2026, in fulfillment of CWC Section 10621(f) and Sections 10644(a)(1), (2), and (b), Metropolitan's final 2025 UWMP and WSCP were electronically submitted to the State of California through DWR's WUE data website https://wuedata.water.ca.gov/secure/.

WSCP Reevaluation and Improvement Procedures

The WSCP will be periodically re-evaluated to ensure that its shortage risk tolerance is adequate and the shortage response actions are effective and up to date based on lessons learned from implementing the WSCP. The WSCP may be revised and updated during the UWMP update cycle to incorporate updated and new information. For example, new supply augmentation actions may be added, and actions that are no longer applicable for reasons such as program expiration may be removed. However, if revisions to the WSCP are warranted before the UWMP is updated, the WSCP will be updated outside of the UWMP update cycle. In the course of preparing the Annual Assessment each year, Metropolitan staff will routinely consider the functionality of the overall WSCP and will prepare recommendations for Metropolitan's Board of Directors if changes are found to be needed.

ATTACHMENTS

Attachment A – Water Surplus and Drought Management Plan

Attachment B – Water Supply Allocation Plan

Attachment C – WSCP Resolution XXXX

ATTACHMENT A

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

WATER SURPLUS AND DROUGHT MANAGEMENT PLAN

REPORT NO. 1150

AUGUST 1999

ACKNOWLEDGMENTS

The consensus reached in the Water Surplus and Drought Management Plan would not have been possible without the dedication and participation of the Rate Refinement Process Workgroup, comprises made by the General Manager, staff from Metropolitan's member agencies, Metropolitan staff, and the dedication and work of the consultants.

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ATTACHMENT A

WATER SURPLUS AND DROUGHT MANAGEMENT PLAN

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

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EXECUTIVE SUMMARY

INTRODUCTION

The Water Surplus and Drought Management (WSDM) Plan for the Metropolitan Water District of Southern California (Metropolitan) is a ten-year plan that will be used to direct Metropolitan's resource operations to help attain the region's 100% reliability goal. The WSDM Plan recognizes the interdependence of surplus and shortage actions and is a coordinated plan that utilizes all available resources to maximize supply reliability. The overall objective of the WSDM Plan is to ensure that shortage allocation of Metropolitan's imported water supplies is not required.

The central effort in developing the WSDM Plan was a participatory process involving Metropolitan and its member agencies. Metropolitan staff and member agency representatives coordinated the Plan's development during a series of meetings of the Rate Refinement Team.

To lay a foundation for the WSDM Plan, participants in the Rate Refinement Process developed a set of proposed WSDM Principles and Implementation Goals which were subsequently adopted by the Metropolitan Board of Directors in September 1998. These Principles and Implementation Goals outline fundamental policies for guiding surplus and shortage management and establish a basis for dealing with shortages in an equitable and efficient manner.

WSDM PRINCIPLES AND IMPLEMENTATION GOALS

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 periods of shortage.

Supporting Principles

- Maintain an ongoing coordinated effort among Metropolitan and its Member Agencies to encourage efficient water use, develop cost-effective local resource programs, and inform the public on water supply and reliability issues

- Encourage local and regional storage during periods of surplus and use of storage during periods of shortage

- Manage and operate Metropolitan's regional storage and delivery system in coordination with local facilities to capture and store surplus water in local groundwater and surface reservoirs

- Arrange for secure sources of additional water from outside the region for use during periods of shortage

- 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

WSDM Plan Implementation Goals

- Avoid mandatory import water allocations to the extent practicable

- Equitably allocate imported water on the basis of agencies' needs

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

  - Impact on retail consumers and economy
  - Reclamation/Recycling
  - Conservation
  - Population and economic growth
  - Investment in local resources
  - Change and/or loss of local supply
  - Participation in Metropolitan's Non-firm (interruptible) programs
  - Investment in Metropolitan's facilities

- Encourage storage of surplus supplies to mitigate shortages and improve water quality

SURPLUS AND SHORTAGE ACTIONS

The region's ability to implement a long-term WSDM Plan results from the significant investments Metropolitan and its member agencies have made in a variety of resources since 1991. These additional resources include increased local conservation and water recycling, improvements in the reliability of imported supplies, increased regional storage, and increased conjunctive use groundwater programs. Together these improvements allow a comprehensive approach to water management.

The growing variety of resources available to the region is transforming Metropolitan from an agency with relatively modest storage capacity to one that will have storage sufficient to manage many shortages without impacts to its member agencies or retail customers. To attain this level of reliability, all storage programs and facilities, along with conservation, recycling, and other programs, must be managed as an integrated set of regional resources. To accomplish this, the WSDM Plan establishes the linkage between surplus and shortage resource management actions.

When imported supplies exceed projected demands for imported water within Metropolitan's service area, Metropolitan can operate available storage facilities to maximize the benefits of stored water to its member agencies. A number of factors affect Metropolitan's ability to divert surplus water into storage. Some of these factors include facility outages, system capacity, water quality (including requirements for managing total dissolved solids), and varying supply and demand patterns. The WSDM Plan provides a description of storage options available to Metropolitan and a framework for storing water in these programs and facilities when surplus supplies are available.

Except in severe or extreme shortages (defined in the Introduction) or emergencies, Metropolitan's resource management will allow shortages to be mitigated without impacting retail Municipal and Industrial (M&I) customers. A list of resource management actions and their descriptions are provided

below. This list emphasizes critical storage programs and facilities, and conservation programs that make up part of Metropolitan's response to shortages. The order in which these actions are presented does not imply the exact operational management of resources that would occur during a shortage, rather it represents a general framework and guide. In fact, several actions are likely to be taken concurrently. Many factors will dictate the exact order in which these actions will be taken during shortages. One action, however, will have an assigned prioritization: the curtailment of Full Service (firm) deliveries will be last. The following summarizes the drought actions:

- Draw on storage in the Eastside Reservoir Project
- Draw on out-of-region storage in Semitropic and Arvin-Edison
- Reduce/suspend long-term seasonal and groundwater replenishment deliveries
- Draw on contractual groundwater storage programs in the region
- Draw on State Water Project (SWP) terminal reservoir storage (per Monterey Agreement)
- Call for extraordinary drought conservation and public education
- Reduce Interim Agricultural Water Program (IAWP) deliveries
- Call on water transfer options contracts
- Purchase transfers on the spot market
- Implement the allocation of Metropolitan's imported supplies to its member agencies

For the ten-year period addressed by the WSDM Plan, 1999-2008, the majority of shortage contingencies will be managed by withdrawals from storage, groundwater management and options transfers. Shortages managed using these actions would not impact the quantity of water delivered to member agencies for consumptive uses. In fact, when coupled with other drought actions such as extraordinary conservation and reduction of agricultural deliveries, it is fully expected that an allocation of firm imported water supplies will not be necessary during the next ten years. Under this worse-case scenario, an approach to allocate Metropolitan's firm imported water supplies in a fair and equitable manner will be developed.

The overall policy objective of the allocation method will be to minimize the impacts to any one agency and the region as a whole. To meet that objective, the method of allocating firm imported supply will account for:

- Each agency's demands on Metropolitan,
- Each agency's local resources
- Each agency's total retail demands.

The WSDM Plan allocation method would address each of these supply and demand components and account for each agency's conservation and recycled water programs. A pricing structure will be coupled with the WSDM allocation method to accomplish two goals:

- Encourage conservation and water recycling
- Ensure that the regional impact of the shortage is as small as possible

To provide as much water as possible without changing wholesale prices, the allocation of all available supplies will be made at the prevailing rates for firm deliveries. In order to encourage conservation to the level of allocation, the rate for agency usage from 100-102% of its allocation will be the Full Service rate plus $175. Usage above 102% of allocated supply will be charged at three times the Full Service rate. Any substantial change in Metropolitan's water rate structure may require these rates to be revised.

During severe or extreme shortage conditions, public outreach will play a critical role in shaping consumer response. Public information campaigns will send clear signals if extraordinary drought conservation is required. An effective public information campaign requires a joint effort among Metropolitan and its member agencies. Under this Plan, the administration of the Public Information and Government Affairs program will be the responsibility of a Drought Program Officer (DPO). The DPO will be responsible for integrating the various activities in these areas, coordinating efforts with Metropolitan's Board of Directors and member agencies, and designing the region-wide messages for the general public and various target audiences. Important constituencies are residential users, industrial and institutional users, business interests, agricultural users, elected officials, officials of various agencies such as the Department of Water Resources, and the media.

INTEGRATED RESOURCES MANAGEMENT

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 trader shortage scenarios based on historical hydrologic 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. When do various pieces of information about the supply/demand balance become more certain? When should this information impact policy-making and trigger various resource actions? The WSDM Plan addresses these questions and the actual implementation of the Plan during a shortage.

Appendix A of this report provides a ten-year simulation of projected demands and supplies showing an example of how the region can maintain 100% reliability.

INTRODUCTION

The Metropolitan Water District of Southern California (Metropolitan) provides water to a service area covering approximately 5,200 square miles. Over 16.5 million people live within the service area, which supports a $500 billion economy. Metropolitan provides supplemental supplies to twenty-seven member agencies, both retail and wholesale agencies, who in turn provide water to over three hundred cities and local agencies providing supplies at the retail level. In recent years Metropolitan supplemental deliveries have accounted for about one-half to two-thirds of the region's total water demands. With supplies from its Colorado River Aqueduct (CRA) and the State Water Project (SWP), Metropolitan delivers water for municipal and industrial (M&I) uses, agricultural uses, and augmentation of local storage.

As part of the implementation of the regional Integrated Resources Plan (IRP), Metropolitan and its member agencies have developed the Water Surplus and Drought Management (WSDM) Plan for Southern California. This ten-year plan will direct Metropolitan's resource operations to help attain the region's 100% reliability goal. Over this ten-year period, the WSDM Plan will be updated to account for changes impacting supplies from the Colorado River and California's Bay-Delta. In the past, Metropolitan has developed drought management plans that simply addressed shortage actions and primarily focused on issues of short-term conservation and allocation of imported water. The WSDM Plan recognizes the interdependence of surplus and shortage actions and is a coordinated plan that utilizes all available resources to maximize supply reliability. The overall goal of the WSDM Plan is to ensure that shortage allocation of Metropolitan's imported water supplies is no---At required.

Because it addresses both surplus and shortage contingencies, the WSDM Plans draws clear distinctions among the terms *surplus, shortage, severe shortage,* and *extreme shortage.*

***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 and local facilities for storage.*

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

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

ATTACHMENT A

WSDM PRINCIPLES AND IMPLEMENTATION GOALS

The central effort in developing the WSDM Plan was a participatory process involving Metropolitan and its member agencies. Metropolitan staff and member agency representatives coordinated the Plan's development during a series of meetings of the Rate Refinement Team and the Integrated Resources Planning Workgroup. To lay a foundation for the WSDM Plan, participants in the Rate Refinement Process developed a set of "WSDM Principles and Implementation Goals."

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 periods of shortage.

Supporting Principles

- 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

- Encourage local and regional storage during periods of surplus and use of storage during periods of shortage

- Manage and operate Metropolitan's regional storage and delivery system in coordination with local facilities to capture and store surplus water in local groundwater and surface reservoirs

- Arrange for secure sources of additional water from outside the region for use during periods of shortage

- 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

WSDM Plan Implementation Goals

• Avoid mandatory import water allocations to the extent practicable

- Equitably allocate imported water on the basis of agencies' needs

  Considerations to create an equitable allocation of imported water may include:
  - Impact on retail consumers and economy
  - Reclamation/Recycling
  - Conservation
  - Population and economic growth
  - Investment in local resources
  - Change and/or loss of local supply
  - Participation in Metropolitan's Non-firm (interruptible) programs
  - Investment in Metropolitan's facilities.

- Encourage storage of surplus supplies to mitigate shortages and improve water quality

REGIONAL RESOURCES AND DEMANDS

Southern California receives its water supplies from a variety of different sources, both local to the region and imported from outside the region. These sources are summarized below.

Local Supplies

Local supplies include groundwater pumping of local aquifers, surface reservoir production, recycled water, and supplies imported through wheeling arrangements or through the Los Angeles Aqueduct, which is owned and operated by the City of Los Angeles. Local supplies have, in the past, provided as much as 2.1 million acre-feet (maf) of water to meet the region's water demands. By far the largest component of local supplies is groundwater pumping, providing over 75% of historical local supplies.

Colorado River Supplies

The distribution and management of Colorado River water is governed by a complex body of laws, court decrees, compacts, agreements, regulations, and an international treaty collectively known as the "Law of the River." Metropolitan's entitlement is established by the fourth and fifth priorities of California's Seven Party Agreement, included in Metropolitan's 1931 and 1946 contracts with the Secretary of the Interior. These priorities provide 550,000 acre-feet (af) per year and 662,000 af per year, respectively. In addition, Metropolitan holds a surplus water contract for delivery of 180,000 af. The physical capacity of the CRA is slightly in excess of 1.3 maf per year, based on a pumping capacity of 1,800 cubic feet per second (cfs). Metropolitan's long-held objective is to maximize the availability of Colorado River water, up to the maximum capacity of the CRA, subject to environmental, contractual, legal, political, financial, and institutional constraints. A California 4.4 Plan is being developed among California parties that will help ensure that full CRA deliveries are maintained, while addressing the concerns of the other Colorado River basin states that rely on the river. The California 4.4 Plan includes core transfers (such as the IID/MWD conservation agreement and the proposed IID/SDCWA transfer), system conservation (such as the lining of the All American Canal), offstream storage (such as the Arizona groundwater storage program), dry year option transfers (such as PVID land fallowing), and river re-operations.

State Water Project

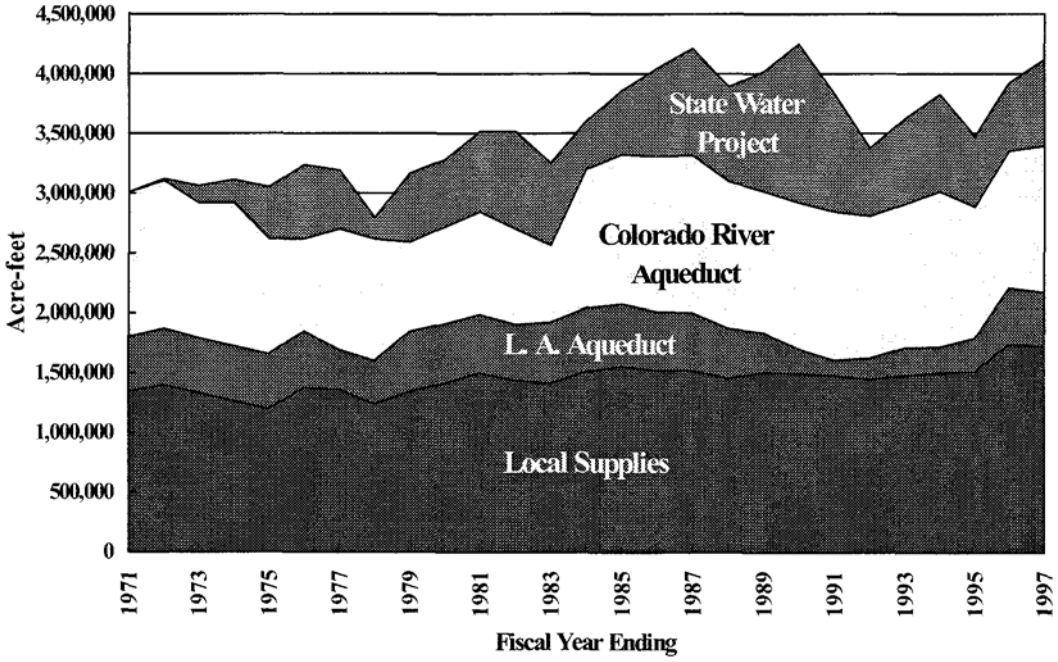
Metropolitan is one of 29 water agencies that have contracted with the State of California, through the Department of Water Resources (DWR), for water deliveries from the SWP system. Metropolitan's contracted entitlement is for 2.01 maf per year, or about 48 percent of the total contracted entitlement of 4.2 maf per year. SWP deliveries to Metropolitan are made via the SWP's California Aqueduct.

Initial SWP facilities, completed in the early 1970's, have produced average supply yields adequate to meet just over half of the total contracted entitlement. While it was intended that additional SWP facilities would be constructed as SWP contractor demands increased up to their contracted entitlements, few facilities have been constructed since that time.

The SWP obtains its supplies primarily from the Sacramento River Basin. About half of the total supply diverted from the Delta for the SWP is regulated flow from the Feather River (a tributary to the Sacramento River), while the other half is unregulated flow from runoff downstream of Sacramento River reservoirs and from other rivers that flow into the Delta. The Sacramento River watershed is subject to wide annual variations in total runoff. The Sacramento River Index (SRI), which measures runoff in the watershed, has averaged about 18 maf per year over the last 90 years. However, runoff varies widely from year to year. For example, the SRI measured 7.8 mafin 1994 and 32.5 mafin 1995.

Figure 1 shows the historical total regional supply production by type. As shown in Figure 1, water supplies were as high as 4.25 mafin 1990 and within two years dropped to 3.4 mar, a 20% decrease.

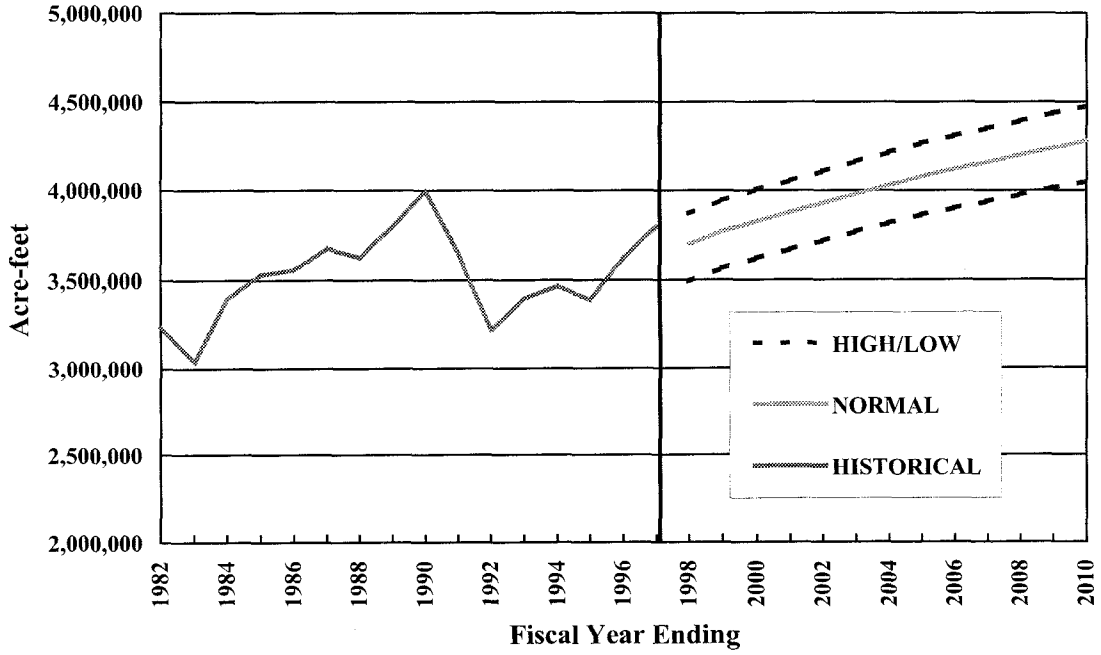
Figure 1. Historical Supply Production by Type of Supply



RETAIL DEMANDS

From 1982 through 1995, the region experienced retail water demands averaging 3.5 mar. In dry years retail demands are approximately 5 to 7% greater than normal years, while demands in wet years are about 6 to 8% below normal demands. Under normal weather conditions, assuming full implementation of conservation best management practices, total regional retail demands are projected to increase from about 3.7 mar in 1997 to almost 4.3 mar in 2010. Without conservation, demands in 2010 would be about 10 to 12% greater than projected. Increases in retail demand are driven by demographics and economics, including changes in population, housing, employment, and income. Figure 2 shows the historical and projected retail demands in Metropolitan's service area.

Figure 2. Regional Retail Water Demands



The historical variability in demands from 1982 to 1997 is mainly due to weather and the economy. In 1983, extreme wet weather caused a significant drop in retail demands. During the period from 1985 to 1990, hot and dry weather coupled with a strong economy resulted in increased demand from 3.5 maf to 4.0 maf, a 14% increase. In 1991, the 5th year of a prolonged drought, conditions forced many communities to implement mandatory supply reductions. These mandatory reductions coupled with extraordinary drought conservation caused a 10 to 15% decrease in retail demands for the region. In addition, the period between 1992 and 1995 was very wet (with the exception of 1994, which was dry), and was a period of severe economic recession. Southern California alone lost some 700,000 jobs from 1990 through 1995. The combination of wet weather, economic recession, and conservation resulted in demands decreasing by over 17%.

DEMANDS ON METROPOLITAN

For many member agencies, Metropolitan's water deliveries represent a supplemental supply. Most member agencies have local water supplies, but agencies differ in how much their supplies alone can meet their respective retail demands. Local supplies are often base-loaded (maximized subject to various constraints) and purchases from Metropolitan are used to meet remaining demands. In addition, to meeting consumptive demands, Metropolitan's deliveries are used to replenish local groundwater and surface reservoirs. To project demands on Metropolitan, projections of member agency's retail water demands and local water supplies are made. Local supplies are then subtracted from retail demands to get consumptive demands on Metropolitan. A projection of Metropolitan's long-term seasonal and replenishment deliveries are made based on safe groundwater yield and weather/hydrology.

Metropolitan forecasts its demands for three different broad categories: Full Service, Seasonal (reservoir storage and groundwater replenishment delivered for shift or long-term storage purposes and sold at a discount), and Agricultural (deliveries of water sold at a discount for agricultural use). Overall, demands on Metropolitan can vary -+ 11 to 18% from normal conditions due to weather and hydrology.

The following four figures show historical and projected demands on Metropolitan by category. Figure 3 shows Basic Water Deliveries, Figure 4 shows Seasonal Water Deliveries, Figure 5 shows Interim Agricultural Water Program (IAWP) Deliveries, and Figure 6 shows Total Water Deliveries for Metropolitan.

Figure 3. MWD Basic Water Deliveries

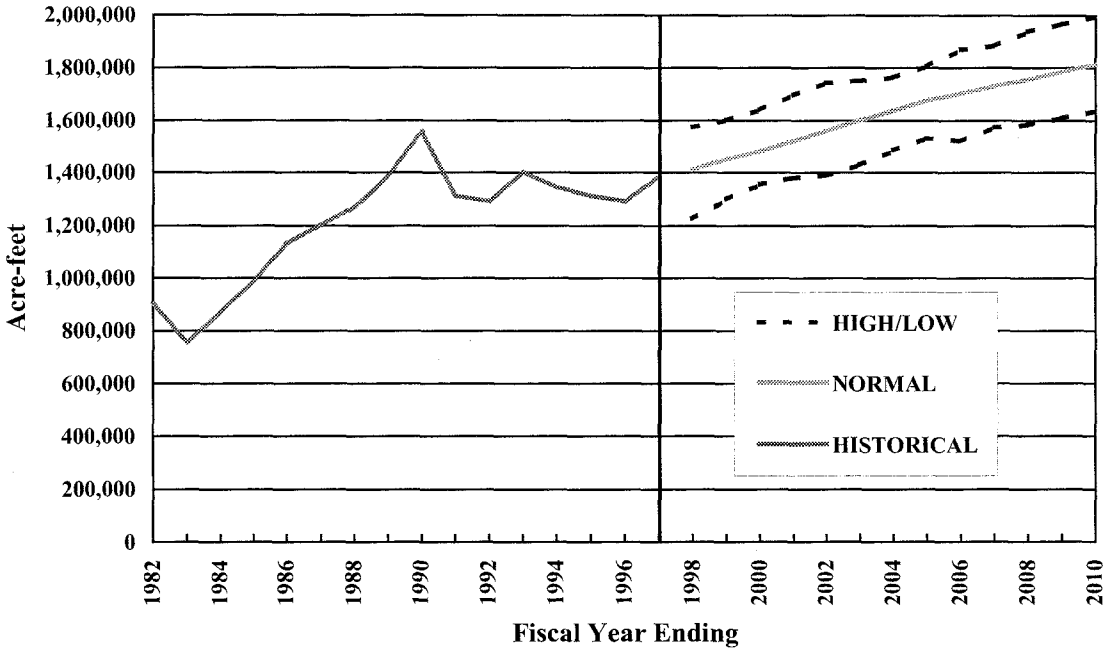


Figure 4. MWD Seasonal Water Deliveries

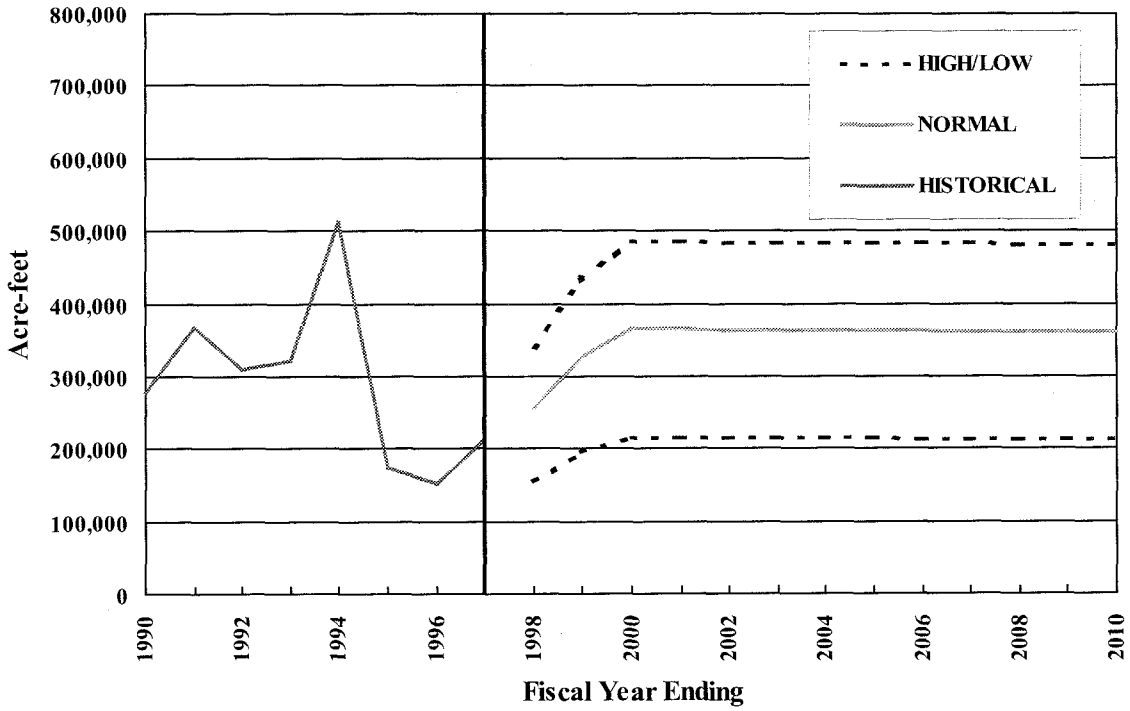


Figure 5. MWD Interim Agricultural Water Program (IAWP) Deliveries

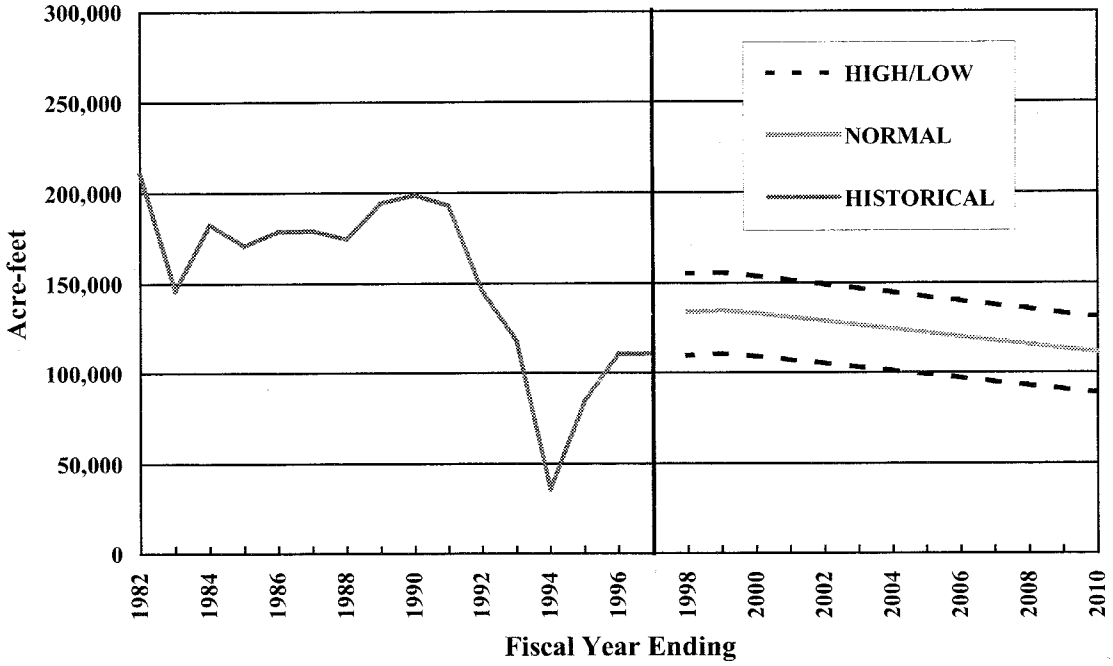
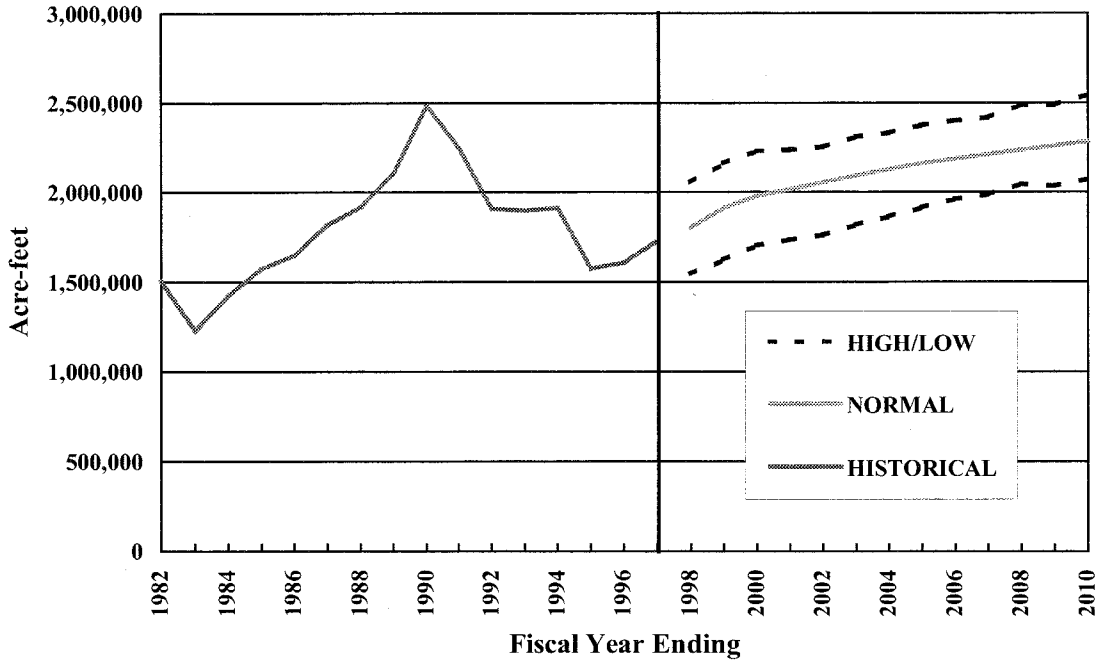


Figure 6. MWD Total Water Deliveries



INTEGRATED RESOURCES PLANNING

To ensure supply reliability under various drought conditions, Metropolitan and its member agencies developed an Integrated Resources Plan (IRP). The IRP, adopted by Metropolitan's Board of Directors in January 1996 and periodically updated, guides Metropolitan's resource and capital improvements investments. The region's ability to develop a long-term WSDM Plan results from the significant investments Metropolitan and its member agencies have made in resources since 1991. To date, these investments include:

- Local supplies: Metropolitan co-funded over 23 local projects and 200 conservation programs that will yield a total of 160,000 af per year.

- **Colorado River Aqueduct:** Metropolitan developed transfers and storage programs to help ensure a full aqueduct. The landmark Metropolitan/Imperial Irrigation District Conservation Program (IID), will result in a savings of 107,000 af per year. Storage programs in Arizona and California, combined with the IID savings, yield a total of 280,000 af of annual core, dry year options, and storage supply.

- **State Water Project:** Metropolitan and other parties negotiated the Bay-Delta Accord and the Monterey Amendment. The Bay-Delta Accord and subsequent efforts will increase the reliability of Metropolitan's entitlement deliveries. The Monterey Amendment provides access to 220,000 af of SWP storage.

- **In-Basin Storage:** Metropolitan is constructing the Eastside Reservoir Project, with 800,000 af of storage (400,000 af of which is emergency storage for use in case of facility failure as a result of earthquake or other event).

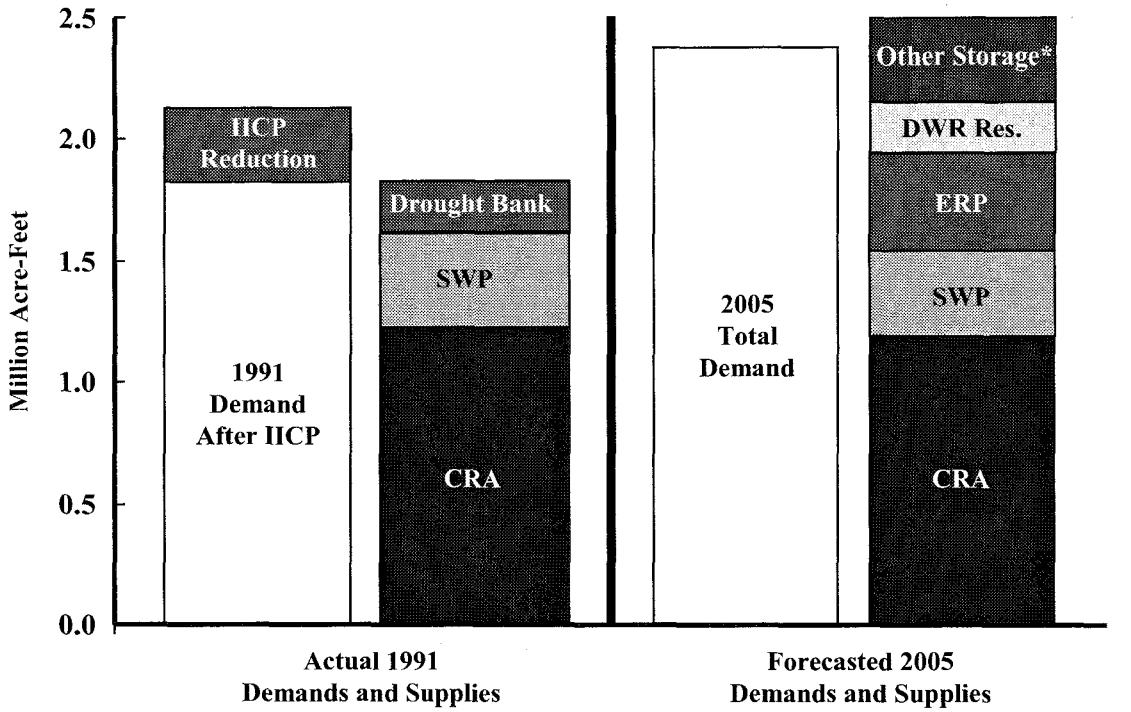
- **Groundwater Conjunctive Use Storage:** Metropolitan developed a conjunctive use storage program in the North Las Posas Basin in Ventura County with an anticipated capacity of 210,000 af and a dry-year withdrawal rate of up to 70,000 af.

- **Transfers and Storage:** Metropolitan developed the Semitropic Storage Program, with 350,000 af of storage and dry-year withdrawals averaging about 60,000 af. Metropolitan also approved the Arvin-Edison Storage and Transfer Program, with 250,000 af of storage and dry-year withdrawals averaging about 70,000 af. Metropolitan is also exploring storage and transfer programs with the Coachella Valley Water District and the Cadiz Land Company.

As a result of these investments, it is anticipated that Metropolitan and its member agencies will be 100% reliable over the next 10 years even under a repeat of the 1991 drought condition. Figure 7 compares actual Metropolitan demands and supplies during 1991 (the last year in a multiyear severe drought) and projected demands and supplies in year 2005 (assuming a repeat of 1991 conditions). In 1991, the region faced shortages that required Metropolitan to allocate water under the Incremental Interruption and Conservation Plan (IICP). The reduction in deliveries came after demands had already been reduced as a result of local conservation. In addition, water had to be purchased from the Governor's drought emergency water bank. By the year 2005 with the investments made to date,

Metropolitan's additional water supplies will be more than adequate to meet demands under a repeat of the 1991 drought event--even with increased demands due to growth.

Figure 7. Historical and Projected Metropolitan Supplies and Demands Under Drought Conditions



*** Groundwater management, Semitropic Storage Program, and Arvin-Edison Storage Program**

SURPLUS AND SHORTAGE RESOURCE ACTIONS

Metropolitan's investments in water resources, facilities, and programs has transformed it from an agency with relatively modest storage capacity to one that will have storage sufficient to manage many shortages without negative impacts to its member agencies or retail customers. To attain this level of reliability, storage programs and facilities, along with conservation, recycling, and other programs, must be managed as an integrated set of regional resources. To accomplish this, the WSDM Plan recognizes the linkage between surplus and shortage resource management actions.

SURPLUS ACTIONS

The combination of Metropolitan's regional storage facilities, such as Lake Mathews, Lake Skinner, the future Eastside Reservoir Project, and the storage capacity available to Metropolitan in Castaic Lake and Lake Perris as a result of the Monterey Amendment, allows Metropolitan great flexibility in managing its water resources. The development of storage programs both outside and within the service area provides even greater flexibility in storing surplus water. Each of the storage facilities and programs plays an important role in achieving Metropolitan's reliability goal.

When imported supplies exceed projected demands for imported water within Metropolitan's service area, Metropolitan can operate storage facilities to maximize stored water to benefit its member agencies. A number of factors affect Metropolitan's ability to divert surplus water into storage. Some of these factors include facility outages, system capacity, water quality (including requirements for managing total dissolved solids), and varying supply and demand patterns. This section provides a description of storage options available to Metropolitan and a framework for storing water in these programs and facilities when surplus supplies are available.

Storage of Colorado River Supplies

Metropolitan has participated in a number of programs to maximize the reliability of supplies from the Colorado River. The landmark Metropolitan/Imperial Irrigation District Conservation Program will result in a savings of 107,000 af per year. These supplies will increase the reliability of Metropolitan's entitlement of Colorado River water. Other programs yield shortage benefits by increasing amounts of water stored for use during shortages. Between August 1992 and July 1994, Metropolitan and the Palo Verde Irrigation District conducted a Test Land Fallowing Program. Approximately 20,000 acres of farmland in the Palo Verde Valley were not irrigated, saving 186,000 af of water which was stored in Lake Mead for later use by Metropolitan. With Arizona and Nevada water agencies, Metropolitan is participating in a Central Arizona Groundwater Storage Demonstration Program that has encouraged the storage of water. To date, 139,000 af of supplies have been stored in groundwater basins in Central Arizona. The Desert Coachella program is an exchange and storage program with agencies situated along the Colorado River Aqueduct. Metropolitan releases Colorado River water for storage in the Coachella Groundwater Basin. Metropolitan then exchanges these supplies for the

participating agencies' SWP supplies. These programs serve as models for future programs that could increase the reliability of Colorado River supplies. Metropolitan continues to explore other possible options that would increase the reliability of supplies. The California 4.4 Plan is being developed among California parties to increase storage programs for Colorado River supplies. In addition to core transfers and conservation programs, the California 4.4 Plan includes offstream storage (such as the Arizona groundwater storage program), dry year option transfers (such as PVID land fallowing), and river re-operations. These programs, in conjunction with favorable supply determinations by the Secretary of Interior, will ensure the highest possible reliability of Colorado River supplies.

In addition to the programs mentioned above, the Colorado River system itself contributes to the high reliability of Metropolitan's Colorado River supplies. Currently, the average Colorado River runoff exceeds basin-wide demands by over 1.0 maf per year. The Colorado River system also contains a great deal of reservoir storage capacity. The total storage capacity in the Colorado River Basin is approximately 60 maf, almost four times the Colorado River's average annual flow. For much of 1997, system storage levels were at 80% or more of total capacity. These factors allow the Bureau of Reclamation, operators of the Colorado River system, to store significant supplies for use during shortages.

Storage of State Water Project Supplies

Total storage capacity is a critical factor in comparing the operations of the Colorado River system with the SWP. On average, both systems have similar amounts of water available on an annual basis. The SWP's watersheds in the Sacramento River Basin have produced about 18 maf per year over the long term, as represented by the Sacramento River Index (SRI.) Long-term runoff on the Colorado River has averaged more than 16 maf annually since 1906. However, the ability to carry over unused water from a wet year for use in a dry year differs substantially between the two systems. State Water Project storage facilities have storage capacity of about 4.5 maf, while system storage in the Colorado River Basin totals nearly 60 maf. This gives the operators of the Colorado River reservoirs much more flexibility in storing unused water from a wet year for use in a subsequent dry year.

When water from the SWP cannot be put to immediate use in Metropolitan's service area, the water may be stored for future use. Provided storage capacity is available, the water may remain in either Oroville Reservoir (as SWP storage for delivery to all contractors the following year) or San Luis Reservoir (as carryover storage assigned to Metropolitan). Through the carryover storage program, as amended by the Monterey Amendment, Metropolitan can place a maximum of 200,000 af per year of allocated supplies in SWP surface reservoirs. The program also allows for carryover storage in non-project facilities, including surface reservoirs and groundwater basins. In the case of carryover storage in San Luis Reservoir, SWP supplies allocated to but unused by a contractor may, under certain conditions, be assigned as carryover if storage capacity is available at the end of the calendar year. However, carryover water stored for a contractor has lower priority than storage of SWP water and consequently "spills" first as San Luis Reservoir fills.

Also, in a wet year such as 1995, low demands may allow DWR to operate San Luis Reservoir nearly full, eliminating any possibility of contractor carryover storage into the following year. As a result, carryover storage on the SWP may not be possible, and even when possible, is subject to spilling.

Due to these carryover storage limitations, Metropolitan has invested a great deal to expand its ability to store surplus SWP supplies. Metropolitan has entered into a number of water transfer and storage agreements. The Semitropic Water Banking and Exchange program allows Metropolitan to store up to 350,000 afin the groundwater basin underlying the Semitropic Water Storage District. The storage and withdrawal capacities of the program are shared with other participants in the storage program, with Metropolitan's share equaling 35%. Dry-year withdrawals will average about 60,000 af.

Metropolitan and the Arvin-Edison Water Storage District have developed a program that allows Metropolitan to store water in the groundwater basin in the Arvin-Edison service area. The program would allow the storage and withdrawal of 250,000 af of supplies over the next 25430 years. Dry-year withdrawals will average about 70,000 af.

Storage in Regional Facilities

In addition to the storage of Colorado River and SWP supplies outside the region, Metropolitan has established a number of programs for storing supplies within the region. Metropolitan owns and operates two main surface reservoirs, Lake Mathews and Lake Skinner, which have a combined storage of about 226,000 af. Only a small portion of this capacity is available for shortages, with the balance being used to regulate flows in Metr0Politan's delivery system. The Eastside Reservoir Project, currently under construction, will have a total capacity of 800,000 af, with approximately 400,000 af of operational drought and seasonal storage and 400,000 af of emergency storage. Through the Monterey Amendment, Metropolitan obtained the fight to use up to 220,000 af of water stored in the SWP terminal reservoirs. However, withdrawals from these terminal reservoirs must be replaced within five years.

Metropolitan and its member agencies have established the cyclic storage program to increase storage in groundwater basins within the service area. Regional groundwater basins offer an economical way for Metropolitan to improve supply reliability by storing water within the service area. This makes water readily accessible in times of need, either in emergency situations or during shortages. Some limitations are imposed by the fact that such water can generally only be used through pumping from the groundwater basin by an overlying member agency or local agency. Storage in groundwater basins takes place either by direct replenishment (spreading or injection), or through in-lieu means. Spreading (or injection) is desirable because direct measurement of the amount of stored water is a relatively simple, verifiable transaction. The main disadvantage to direct spreading is that spreading can occur only under certain conditions. For example, spreading cannot occur when spreading facilities are being used to capture local storm runoff for flood control purposes, or when the amount of local runoff precludes the need

for imported water to replenish the basins. Also, spreading basins require frequent maintenance to assure maximum efficiency. These and other conditions can limit the ability to deliver water for spreading at a time when surplus supplies are available.

In-lieu replenishment allows most member agencies to participate in groundwater replenishment without needing direct access to replenishment facilities. Their wells, in effect, become their replenishment facilities. Both direct and in-lieu replenishment from 1986 through 1990 served the region well during the critical drought years from 1991 through 1993.

The overall objective of the various storage programs is to maximize the availability of imported water during times of need by storing surplus water in a strategic manner and utilizing the storage available within the region. Many factors affect the availability of storage capacity and Metropolitan's ability to move water to and from various facilities. After reviewing the full range of shortage actions available to Metropolitan, a framework for prioritizing the full range of surplus and shortage actions will be presented.

In addition to pricing incentives used to encourage local agencies to store water in groundwater basins, Metropolitan has developed a conjunctive use contractual storage program with the Calleguas MWD in the North Las Posas Basin. Metropolitan will fund the construction of wells which will be called upon to meet demands during dry years. This program will yield a dry year supply of about 70,000 af.

SHORTAGE ACTIONS

Except in severe or extreme shortages or emergencies, Metropolitan's management of available resources will allow shortages to be mitigated without negatively impacting retail M&I demands. Below is a list of drought actions that will be taken during periods of shortage. The goal of these actions is to avoid, to the extent practicable, the allocation of Metropolitan's firm supplies. The order in which these actions are presented does not imply the exact operational management of resources that would occur. In fact, several actions are likely to be taken concurrently. Many factors dictate the particular order in which actions will be taken during an actual shortage, although it is clear that the last action will be the curtailment of firm deliveries to the member agencies.

- Draw on storage in the Eastside Reservoir Project
- Draw on out-of-region storage in Semitropic and Arvin-Edison
- Reduce/suspend long-term seasonal and groundwater replenishment deliveries
- Draw on contractual groundwater storage programs in the region
- Draw on SWP terminal reservoir storage (per Monterey Agreement)
- Call for extraordinary drought conservation and public education
- Reduce IAWP deliveries
- Call on water transfer options contracts
- Purchase transfers on the spot market
- Implement an allocation of Metropolitan's imported supplies to its member agencies

Even with dedicated programs to meet the reliability goal for the region, proper management and operations of these resources is critical to ensure reliability. The prioritization of both surplus and shortage actions need to account for several important criteria. It is also important to recognize that these criteria will need to be balanced. The criteria include:

Location: Out-of-region storage is more vulnerable than in-basin-storage due to the risks of seismic events. To only maximize out-of-region storage will put reliability at risk.

Take capacity: Surface reservoirs generally have the ability to be filled and drawn down very quickly. Certain groundwater storage programs have limited take capacities--requiring several years at full take capacity to withdraw **all** available storage. Stored water will be balanced so that dry year supplies are maximized.

Cost: Programs vary with respect to their marginal operating costs. Program actions will be taken to maximize supply reliability while minimizing cost.

Flexibility: Not all storage programs and transfers offer the same flexibility to Metropolitan. Some programs can only meet specific overlying demands, while others can meet demands anywhere in the system.

DESCRIPTIONS OF RESOURCE ACTIONS

Draw on storage in the Eastside Reservoir Project: Withdrawals from the Eastside Reservoir Project would provide a flexible supply for meeting a shortage. Eastside Reservoir Project supplies can be drawn upon quickly. The amount of water drawn from the Eastside Reservoir Project before exercising other shortage actions will depend on the severity of the shortage and the overall condition of other resources available to Metropolitan.

Draw on out-of-region storage in Semitropic and Arvin-Edison programs: Out-of-region programs such as Semitropic and Arvin-Edison provide cost-effective shortage supplies. These supplies also provide flexibility, as they can be distributed as effectively as any SWP supplies coming into Metropolitan's service area. Exercising these programs relatively early in the order of actions reduces the risk of leaving supplies out-of-region. Based upon the ratio of storage capacity to take capacity, these programs will generally provide supplies over several years. This provides the rationale for calling on these programs relatively early in a shortage.

Reduce Long-Term Seasonal and Replenishment Deliveries, and call on cyclic storage accounts: Certain interruptible supply programs provide benefits during shortage. Reducing deliveries to interruptible programs established for storage purposes, while continuing expected levels of groundwater production, allows limited supplies to go toward meeting direct consumptive uses. In addition, calling on cyclic storage accounts can extend the replenishment needs for several years. Most replenishment supplies would be expected to be interruptible for a minimum of two years before agencies would be allowed to claim a local supply adjustment on such supplies. Some programs have longer interruption requirements. For example, most Groundwater Recovery Programs are governed by contracts that require supply production through a three-year interruption in service.

Draw on contractual groundwater storage programs: In-region contractual groundwater programs provide cost-effective supplies that would be drawn upon during shortages. These programs are also

limited by their take capacities and generally have several years of withdrawals in storage. For this reason, these programs might be called upon before withdrawing heavily from surface reservoir storage.

Draw on SWP terminal reservoir storage: The storage available in the SWP terminal reservoirs provides a flexible and cost-effective shortage supply. Supplies withdrawn from this program must be replaced within five years of withdrawal. For this reason, the storage in these reservoirs would be reserved for more serious shortage conditions and would be utilized after the programs and facilities listed above were used to meet the shortage.

Call for extraordinary drought conservation: Voluntary conservation programs have historically been effective in reducing water demand during drought. However, voluntary conservation programs are not without impact to the retail customer and can be perceived as a failure of water agencies to properly plan for shortages. Therefore, the call for extraordinary drought conservation will only be taken with the consent of Metropolitan's Board of Directors.

Reduce agricultural deliveries: The Interim Agricultural Water Program (IAWP) offers interruptible water to southern California's agricultural industry at discounted rates. These supplies will be interrupted as part of Metropolitan's shortage actions. Metropolitan will work with IAWP participants to provide as much advance warning of interruption as possible. The IAWP reflects current policies toward agricultural water users. The policies underlying this program are due to be reviewed during the ten-year period of the WSDM Plan. The WSDM Plan will be changed accordingly.

Call on water transfer option contracts: Transfer options programs provide cost-effective supplies when the region is faced with reducing deliveries to meet consumptive demands. These programs might also be used to increase storage levels in Metropolitan storage facilities. Replenishment of these facilities reduces the risk of leaving available supplies outside the region and helps to protect the region during extended shortages.

Purchase transfers on the spot market: During the 1987-92 drought, the Drought Water Bank proved to be one mechanism for California to reduce the overall impacts of the shortage. However, the cost of spot market supplies may cause Metropolitan to use them as a last increment of supply before the region implements reductions in M&I deliveries. It is likewise possible that availability and cost will make spot market options more favorable under certain conditions. If this occurs then spot market supplies will be sought prior to calls on option transfers. However, participation in the spot market may be restricted to those agencies that have already taken significant actions in response to the shortage.

Implement allocation plan: As the final stage in responding to shortages, Metropolitan will implement an allocation plan to deliver reduced supplies to its member agencies. The issues of allocation and the methods of allocation are outlined in the following section.

ALLOCATION OF SUPPLY FOR M&I DEMANDS

The equitable allocation of supplies is addressed by the Implementation Goals established for the WSDM Plan, with the first goal being to "avoid mandatory import water allocations to the extent practicable." The second fundamental goal is to "equitably allocate imported water on the basis of agencies' needs." Factors for consideration in establishing the equitable allocation include retail and economic impacts, recycled water production, conservation levels, growth, local supply production, and participation and investment in Metropolitan's system and programs. In the event of an extreme shortage an allocation plan will be adopted in accordance with the principles of the WSDM Plan.

INTEGRATED RESOURCE MANAGEMENT STRATEGY

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 data. Certain strategies yield high reliability but incur very high costs. This is the case for strategies that utilize relatively costly transfer programs early in a shortage while maintaining high storage levels. If a shortage is short, this results in high transfer costs and shortage storage programs that are not fully utilized. Other strategies draw more heavily on storage early in a shortage and do not use options transfer programs. Later in a shortage, the yields from these transfer programs, combined with low yields from depleted storage facilities, might not make up for continuing or deepening shortages. Overall, such approaches may be inexpensive to pursue at the wholesale level but have high costs associated with retail level impacts. The resource management framework presented results from extensive analysis of various strategies for managing available resources under a variety of surplus and shortage conditions. Although the extent to which various actions are exercised may still vary depending on specific shortage conditions, the ordering presented does reflect Metropolitan's anticipated order of actions during shortages.

RESOURCE MANAGEMENT FRAMEWORK

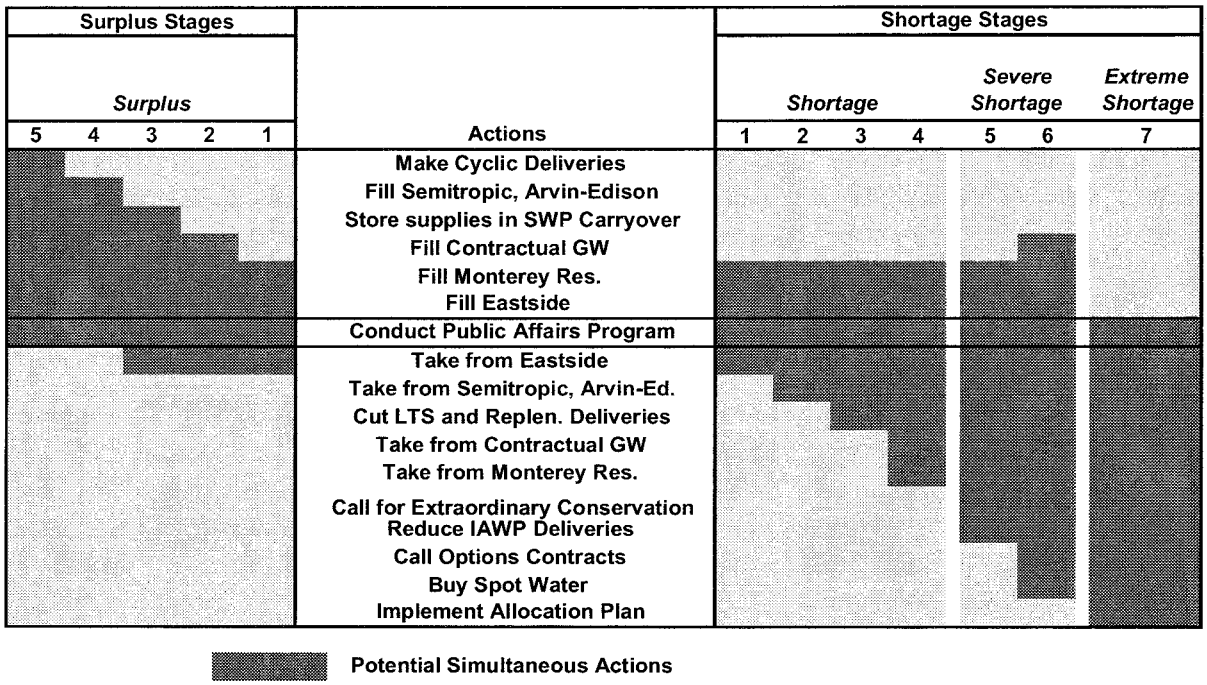
The analysis of surplus and shortage actions yields a water management framework that accounts for the degree or "stage" of surplus and shortage. These stages are defined by parameters such as storage levels and expected SWP supplies. Each stage has associated actions that could be taken as part of the response to prevailing shortage conditions. For example, Surplus Stage 1 might have as associated actions to place water in the highest-priority storage resources. Figure 8 shows the mapping between actions and stages. The darkly shaded diagonal area identifies actions that can be undertaken concurrently, while the lightly shaded areas show actions that will not be taken. For example, Metropolitan will not withdraw water from most storage resources during a surplus.

Figure 8 highlights several aspects of the WSDM Plan's approach to supply management. First and most importantly, it does not dictate a response to shortage or surplus. The framework recognizes the complexity and variety of conditions that could require various responses. Supporting this framework are general "rule curves" that dictate the extent to which particular actions are taken in various stages of surplus or shortage. For example, the rule curves indicate approximately how much water should be taken from the Eastside Reservoir Project before calling on supplies from the Semitropic or Arvin-Edison storage programs. If a shortage were greater than the desired initial withdrawal from the Eastside Reservoir Project, then Stage 2 actions would be taken. The rule curves for a particular resource would take into account shortage stage, monthly delivery requirements, and when various supplies are available.

Surplus and Shortage Stages are determined by the total amount of water that would be stored or produced by exercising the actions in that Stage. Overall storage levels in each stage are determined by the extent to which storage is increased or reduced by earlier actions. Therefore, each Stage is defined by supplies (stored or produced) and an approximate overall level of storage remaining in all resources. Up through Shortage Stage 4, the actions taken will not result in negative impacts to any consumptive uses. Shortage Stages 1 through 4 constitute shortage management without retail level impacts. The conservation efforts and reductions in IAWP deliveries in Shortage Stage 5 will result in retail impacts.

Action by the Metropolitan Board of Directors would be required before actions corresponding to Stages 5, 6, and 7.

Figure 8. Resource Stages and Actions Matrix



The Stages and Actions Matrix (Figure 8) is read from the center moving outward. Moving from the center to the left, are actions that Metropolitan will take during surplus conditions. For instance, in a Stage 3 Surplus, Metropolitan will be adding water to the Eastside Reservoir Project, the Monterey Reservoirs (if any water is due for repayment), Contractual Groundwater Programs, and carryover storage on the State Water Project. Moving from the center to the right are actions that Metropolitan will take during periods of shortage. For instance, in a Stage 3 Shortage, Metropolitan will be pulling water from the Eastside Reservoir Project, the Semitropic and Arvin Edison programs, and interrupting deliveries of Long-Term Seasonal and Replenishment program water. In addition, the Stages and Actions Matrix allows for surplus actions to be taken during shortages and vice versa, but these actions are strictly a result of prudent water management. For example, in a Stage 6 Shortage, Figure 8 shows Metropolitan potentially filling the Eastside Reservoir Project, the Monterey Reservoirs, and contractual groundwater programs while calling on spot transfers and buying spot water. Through these actions Metropolitan will be ensuring that water supply opportunities during a drought are realized--ultimately adding to the drought reserves of southern California.

Figure 8 also highlights the on-going efforts by Metropolitan and its member agencies in the conduct of public outreach and active conservation programs. Through all conditions, effective pubilc outreach and conservation programs are an integral part of Metropolitan's management of resources. In addition to ongoing conservation and water efficiency programs, Stage 5 of the Stages and Actions Matrix calls for participation of the citizens of southern California to take extraordinary conservation measures to cut water demand during droughts.

As with the listing of shortage actions earlier in the report, the Stages/Actions matrix in Figure 8 only highlights certain programs and response actions. However, unlike the discussion of actions earlier, Figure 8 is intended to convey Metropolitan's currently anticipated ordering for those actions listed. As the supply and demand outlooks, programs, and other factors continue to change, the analysis of the ordering of actions will continue during the ten-year period of the WSDM Plan.

SUPPLY CERTAINTY AND THE TIMING OF RESOURCE ACTIONS

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. When do various pieces of information about the supply/demand balance become more certain? When should this information impact policy-making and trigger various resource actions? The WSDM Plan addresses these questions and the actual implementation of the Plan during a shortage.

Figure 9 shows a hypothetical shortage year. With respect to the supply and demand outlook, a typical shortage year will have periods of certainty and stability, and other periods of relative uncertainty and transition. Important supply components--such as the SWP, CRA, Los Angeles Aqueduct (LAA), and local supplies--are closely monitored through the early part of the year. These supplies and demands are fairly well-known through the April-September period. Storage is assessed in the post-summer period and decisions about certain programs, such as long-term (LT) seasonal deliveries could be made at this time.

Figure 9. Water Supply Outlook Throughout the Year

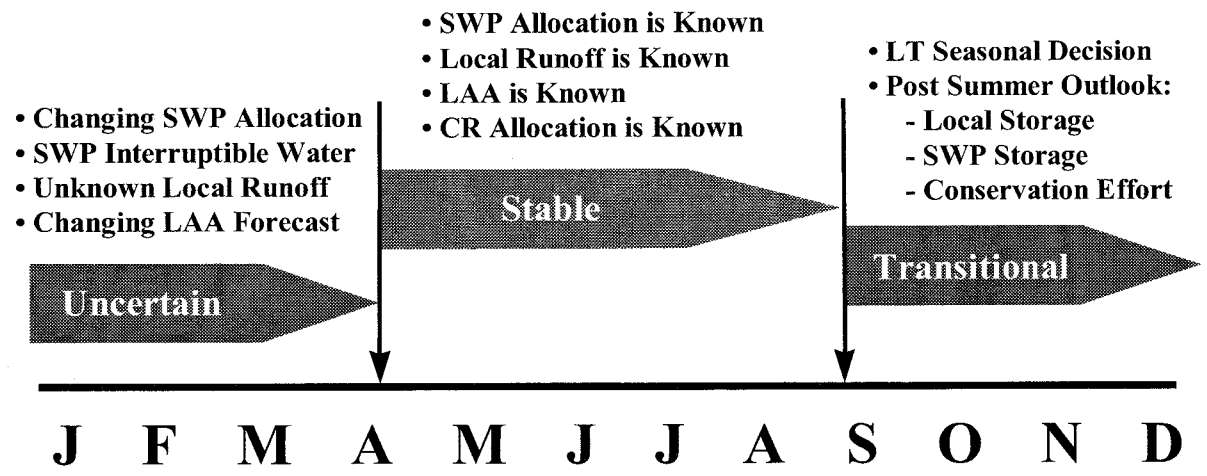
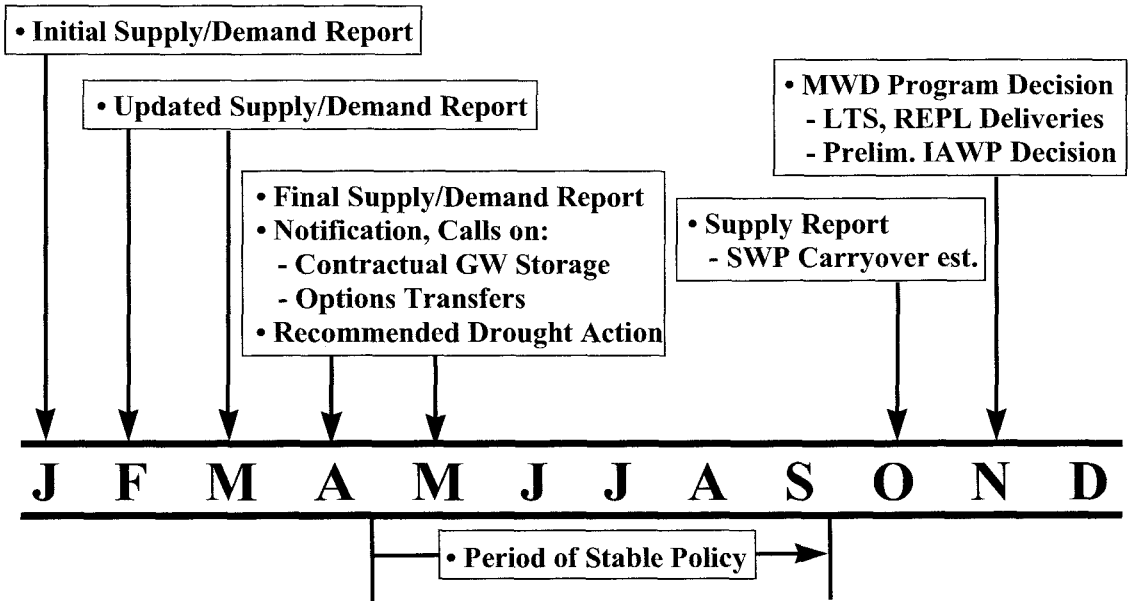


Figure 10 presents the annual schedule for actions taken in response to shortage conditions. Starting in January, an initial supply/demand report will be presented to the Metropolitan Board of Directors. SWP allocations are still only estimates in January and become more certain towards April and May. Demands for Metropolitan deliveries depend in part on how the winter hydrology develops and the condition of local supplies. These factors start to become known during the February-March period and will be reported to the Board in the Supply Report Update. By April-May, the outlook for imported supplies is known to a fairly high degree of certainty and a Final Supply Report will be produced. The May-September period will be one in which the import supply situation does not change drastically and drought policies can be implemented. Demands can be more or less than anticipated as a result of unusually hot or cool weather. At the end of summer, carryover SWP storage will be determined. October through December is a transitional period during which early assessments of available supplies for the following year will be made. During this period, Board actions would determine the management of various Metropolitan programs such as long-term seasonal (LTS) and IAWP deliveries. The following list presents major information and decision points during the year.

Month	Information/Action
January	Initial Supply/Demand Reports
February, March	Updated Supply/Demand Reports
April, May	Final Supply/Demand Report
	Notification on Contractual GW and Options Transfer Programs
	Recommended Drought Actions
May-September	Stable Policy Period
October	Supply and Carryover Storage Report
November	MWD Program Decisions - LT Seasonal, Replenishment, IAWP

Figure 10. One Year of a Hypothetical Shortage - Supply and Demand Reports and Response Actions



PUBLIC OUTREACH AND CONSERVATION

Mechanisms are already in place to implement most of the water management actions and programs that are addressed in the WSDM Plan. Under the majority of supply and demand conditions, the actions of Metropolitan's Board of Directors, the General Manager, the operational activities of Metropolitan, and its member agencies would constitute all actions necessary to mitigate the shortage. Several aspects of the WSDM Plan, however, require additional attention to the administration of programs and actions. In particular, a shortage contingency requires special programs in the areas of public and governmental affairs and conservation. Metropolitan maintains an on-going public information program to encourage efficient water use. Public outreach programs are conducted at all times under both surplus and shortage conditions (see Figure 8). The actions discussed in this section constitute special actions in times of shortage.

During shortage conditions, public outreach will play a critical role in shaping consumer response. Public information campaigns need to send clear signals if extraordinary drought conservation is to achieve needed reductions in demands. Given Metropolitan's diverse set of customers and the varying impacts that shortages can have on different consumer groups, an effective public information campaign will require a joint effort among Metropolitan and its member agencies. Under this Plan, the administration of the Public Information and Government Affairs programs will be the responsibility of a Drought Program Officer (DPO). The DPO will be responsible for integrating the various activities in these areas, coordinating efforts with Metropolitan's Board of Directors and member agencies, and designing the region-wide messages for the general public and various target audiences. Important constituencies that have been identified in the process are residential users, business interests, agricultural users, elected officials, officials of various agencies (such as the Department of Water Resources), and the media.

Many conservation programs, such as Metropolitan's ultra-low flush toilet rebate program, are driven by member agency requests. Based on history, Metropolitan expects member agency requests to increase during droughts. Metropolitan is committed to increasing overall conservation program funding to meet member agency requests during droughts and attain higher levels of savings. These programs will be implemented by Metropolitan and member and local agency conservation staff. As many of the short-term conservation objectives during a shortage would be dependent upon an effective public information program, the Drought Program Officer will also be responsible for monitoring the effectiveness of the augmented conservation programs. A monthly conservation reporting process will be implemented. Quarterly estimates of regional conservation will be developed to track the progress of various actions in mitigating the shortage.

APPENDIX A: RESOURCE AND STORAGE SIMULATION

The Water Surplus and Drought Management Plan (WSDM Plan) uses the Stages and Actions Matrix (Figure 8) as a guide for the operation of storage and transfers for the next ten years, 1999-2008**.** Metropolitan asserts that the investments that Metropolitan and its member agencies have made in water supply and storage, managed in a coordinated manner as presented in the WSDM Plan, will be sufficient to assure that retail firm water demands will be met 100% of the time through the year 2008. Metropolitan performed an extensive analysis of projected water demands, current and expected water supplies, along with hydrologic variations to support this assertion. Appendix A presents a summary of this analysis which includes statistical probabilities of actions under the WSDM Plan and two illustrative examples of how supply resources may be used in the future under worst-case drought events. Although the WSDM Plan is intended to be in effect through 2008, for the purposes of analysis the planning horizon was extended through 2010.

The WSDM Plan seeks to define the operational envelope for the Metropolitan system into the near future. Although the WSDM Plan only looks out ten years, it nonetheless involves the operation of some storage and water transfer projects that have not yet become fully operational. This makes the estimation of storage and transfers operations difficult. Compounding this problem is the lack of certainty around future demands, economic conditions, or even the weather over the next ten years. To manage these uncertainties, Metropolitan has developed a computer based simulation model called the Integrated Resources Planning Simulation Model or IRPSIM.

IRPSIM uses a modeling method known as sequentially indexed monte-carlo simulation. Simply put, the model looks at projected regional retail demand and supplies of water over the next twelve years and adjusts each, up or down, based on an assumed pattern of future weather. For instance, if Metropolitan expected the weather over the next twelve years (1999-2010) to be the same as the last twelve years (1987-1998), then IRPSIM would adjust the projected 1999 demands and supplies based on the historical 1987 hydrology, and adjust the projected 2000 demands and supplies using the historical 1988 hydrology, and so on. One obvious drawback to this approach is that Metropolitan does not know what future weather will be. Therefore, Metropolitan runs the models over and over again until all recorded hydrologies, 70 in all, have been tried. In this way, Metropolitan can look at probabilistic results of being in shortage year by year through 2010.

Although the projections of water supplies used in this analysis required certain assumptions to be made, they were based on most likely or probable outcomes. In most cases, projected water supplies represented projects that are currently operational, under construction, or in the final stages of negotiations. The following represents a summary of these assumptions:

- Local recycling and groundwater recovery: assumes currently operational projects with expected increases in supply yield as demand increases

- Conjunctive use groundwater storage: assumes Las Posas (under final stages of construction) and implementation of similar programs which are under negotiation (such as Raymond, Orange, and Chino Basins)

- Semitropic and Arvin-Edison storage: assumes use of both programs which are operational with water already stored

- Eastside Reservoir Project: assumes use of non-emergency storage from the reservoir currently under construction and an initial fill projected to start in approximately one year

- The Monterey Reservoirs: assumes use of State Water Project terminal reservoir supplies, Castaic and Perris Reservoirs, per the Monterey Amendment

- Colorado River Aqueduct: assumes a full aqueduct through the implementation of the California Plan (including lining of All American and Coachella canals, SD/IID water transfer/exchange, conjunctive use off-aqueduct storage, and river re-operations)

- State Water Project: assumes continuance of Bay-Delta Accord (with only current facilities)

One way of viewing the result of Metropolitan's WSDM Plan analyses is by summary statistics. Table A- 1 gives the probabilities of shortage actions over the next twelve years.

Table A-1. Probability of Shortage Stage[1] by Forecast Year

1999	13%	13%	11%	7%	3%	0%	O%
2000	13%	13%	11%	9%	3%	O%	0%
2001	19%	17%	13%	10%	6%	O%	0%
2002	19%	17%	13%	10%	4%	1%	0%
2003	19%	19%	14%	11%	4%	0%	0%
2004	20%	19%	16%	13%	4%	0%	0%
2005	21%	19%	17%	13%	6%	O%	O%
2006	21%	19%	19%	13%	6%	0%	0%
2007	23%	20%	19%	13%	4%	0%	0%
2008	26%	21%	19%	16%	6%	1%	0%
2009	26%	24%	19%	17%	6%	1%	0%
2010	26%	26%	19%	19%	6%	1%	O%

Table A-1 can be read in one of two ways, by column or row. The Stage 7 column indicates that there are no historical weather conditions that require allocation over the next twelve years. This is the single most important conclusion of the WSDM Plan analysis. The Stage 6 column indicates that only in a few years--2002, and 2008 through 2010--would Metropolitan need have a need for option or spot transfer water. Read by row, Table A-1 indicates that in the year 2008 there is a 21% likelihood of taking some water from the Eastside Reservoir Project, a 19% likelihood of taking water from Semitropic or Arvin-Edison storage programs, a 17% likelihood of interrupting long-term seasonal and replenishment deliveries for two years, and so on. It should be noted that these probabilities represent the best current estimates by Metropolitan, but are based entirely on historical weather conditions. Conditions that fall outside of historical ranges, either in duration or severity, are not represented by this data.

Another way to view the WSDM Plan analysis is by observing the operation of a single hydrology. Table A-2 provides an example of resource operations for the period 1999 through 2010 assuming a repeat of the 1923 through 1934 hydrology. The table provides descriptions of hydrologic conditions to aid in understanding the example.

[1] Stage 1 consists of withdrawal from the Eastside Reservoir Project. Stage 2 consists of the above plus withdrawals from the Semitropic and Arvin-Edison water storage and transfer projects. Stage 3 consists of the above plus an interruption of Long-Term Seasonal and Replenishment discount water. Stage 4 consists of the above plus withdrawal from contractual groundwater programs and the Monterey Reservoirs. Stage 5 consists of the above plus a call for extraordinary drought conservation and interruption in agricultural discount water. Stage 6 consists of the above plus calls on option contract water and purchases of water on the open market. Stage 7 consists of the above plus allocation of remaining shortages. For a full description of stages and action, see Surplus and Shortage Resource Actions section and Figure 8 above.

For instance, 1923 was considered to be a dry year in southern California (defined as less than 9 inches of rain at the Los Angeles Civic Center) and is categorized by the California Department of Water Resources (DWR) as a below normal year for State Water Project deliveries. In this example, 1923 weather increases southern California's demand for water and decreases imported State Water Project supplies. The Colorado River Aqueduct supplies are influenced by yet another hydrologic indicator, but for the next ten year Metropolitan expects the Aqueduct to be full.

Table A-2 indicates that retail water demands in 1999, assuming a 1923 hydrology, will be 3.979 million acre-feet (maf). Adding expected long-term seasonal and replenishment demands of 0.165 maf gives a regional total water demand of 4.144 maf. After subtracting local supplies of 2.192 maf, which are also adjusted for 1923 weather, Metropolitan expects to see a demand of 1.952 maf. In 1999, under a 1923 hydrology, Metropolitan expects to see 2.954 maf of supply. This is enough to meet all expected demands and put over 1.0 maf into storage.

The 1923 through 1934 hydrology is significant because it starts and ends dry with little recovery in the middle. However, even in these most adverse conditions the actions proposed by the WSDM Plan provides the region with enough water to avoid shortage allocation. Again the most important result of this example is read from the last line, which indicates that there are no remaining shortages through 2008

Table A-3 provides a second example of using the 1980 through 1991 hydrology. This hydrology contains the most significant drought in recent record, ending with a critically dry year on the State Water Project that is expected to yield a mere 0.389 maf. However, even under these conditions the WSDM Plan provides a method to avoid firm water allocation.

The analyses performed using the prioritized action of the Stages and Actions Matrix support Metropolitan's assertion that water supply reliability can be attained through the use of regional storage, interruption of discounted water supplies, and transfers. And, through the implementation of the WSDM Plan, Metropolitan does not expect to allocate firm water deliveries for at least the next ten years.

Table A-2. A Simulation of Water Supplies and Demands 1923-1934 Hydrology

Forecast Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Hydrology Year	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
Hydrologic Conditions												
Southern California Year Type	Dry	Dry	Dry	Wet	Wet	Dry	Dry	Normal	Wet	Normal	Wet	Normal
Sacramento River Index D1630 Year Type	Below Normal	Critically Dry	Dry	Dry	Wet	Above Normal	Critically Dry	Dry	Critically Dry	Dry	Critically Dry	Critically Dry
Demands												
Retail Demand	3.979	4.152	4.149	4,018	4.005	**4.249**	4.237	4.223	4.280	4.280	4.407	4.500
Long-term/Replenishment Demand	0.165	0.182	0.226	0.188	0.149	0.176	0,213	0.203	0.164	0.175	0.141	0.163
Total Demand	4.144	4.334	4.375	4.205	4.154	4.425	4.450	4.426	4,443	4.455	4.548	4,663
Local Supplies												
Groundwater Production	1.529	1.545	1.537	1.288	1.299	1.575	**1.568**	1.434	1.307	1.439	1.318	1.454
L. A. Aqueduct Production	0.383	0,287	0.304	0.316	0.392	0.302	0,245	0.235	0.174	0,324	0.251	0.220
Recycling Production	0.152	0.162	0.174	0.186	0,197	0.207	0.217	0.230	0,242	0.254	0.266	0.277
Surface Production	0,128	0,089	0,076	0.116	0.154	0.147	0.108	0.094	0,133	0,136	0.151	0.145
Total Local Supply	2,192	2.084	2.091	1.905	2,043	2.231	2,139	1.993	1.856	2.153	1.986	2,097
Total MWD Demand	1.952	2.250	2,284	2,300	2.112	2.194	2.311	2.433	2.587	2.302	2.562	2.566
MWD Supply Sources												
Colorado River Aqueduct Supply	1.200	1.200	1.200	1.200	1.200	**1.200**	1.200	1.200	1.200	1.200	1.200	1.200
State Water Project Supply	1.754	0.812	0.783	1.280	1.678	1.438	0,764	1.163	0,589	0.843	0.559	0.620
MWD Cyclic Groundwater Deliveries	0.000	0.060	0.060	0.000	0.000	0,000	0.060	0,060	0.060	0.059	0.000	0.000
Eastside Reservoir	0.000	0.066	0.058	0.000	0.000	0.000	0,060	0.010	0.425	0.023	0.219	0.041
Arvin/Semitropic Groundwater Storage	0.000	0.111	0.115	0,000	0.000	0,000	0,119	0,000	0.115	0.117	0.059	0.041
Longterm Seasonal Demand Cuts	0.000	0,000	0,166	0.000	0.000	0.000	0.153	0.000	0.104	0,116	0.000	0.000
Cyclic Benefits	0.000	0.000	0.000	0.000	0.000	0.000	0,000	0,000	0,000	0,000	0.060	0.060
Contractual Groundwater Storage	0.000	0.000	0.000	0,000	0.000	0.000	0.000	0,000	0.095	0.000	0.095	0.084
DWR Reservoirs (Monterey Agreement)	0.000	0.000	0,000	0.000	0.000	0.000	0.000	0.000	0,000	0,000	0.131	0.088
Voluntary Conservation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0,000	0.000	0.206	0.210
MWD Ag Cuts	0.000	0.000	0.000	0.000	0.000	0,000	0.000	0.000	0.000	0.000	0.033	0.031
Central Valley Transfers	0.000	0.000	0,000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.193
Storage Puts	1.003	0.000	0.097	0.180	0.549	0.438	0.045	0.000	0,000	0.056	0.000	0.000
Remaining Shortage	0,000	0,000	0.000	0,000	0.000	0.000	0.000	0,000	0.000	0.000	0.000	0.000

ATTACHMENT A

Table A-3. A Simulation of Water Supplies and Demands 1980-1991 Hydrology

Forecast Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Hydrology Year	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
Hydrologic Conditions												
Southern California Year Type	Wet	Normal	Normal	Wet	Dry	Dry	Wet	Normal	Normal	Dry	Dry	Normal
Sacramento River Index D1630 Year Type	Above Normal	Dry	Wet	Wet	Wet	Dry	Wet	Dry	Critically Dry	Dry	Critically Dry	Critically Dry
Demands												
Retail Demand	3.781	4.170	3.930	3.647	4.308	4.250	4.151	4.281	4.380	4.550	4.663	4.497
Lon£1-term/Replenishment Demand	0.105	0.141	0.171	0.101	0.136	0.187	0.183	0.201	0.191	0.219	0.224	0.214
Total Demand	3.886	4.311	4.101	3.748	4.444	4.437	4.334	4.483	4.572	4.769	4.887	4.712
Local Supplies												
Groundwater Production	1.292	**1.440**	**1.381**	1.248	1.546	1.565	1.275	1.413	1.438	1.588	1.600	1.446
L. A. Aqueduct Production	0.462	0.372	0.499	0.529	0.516	O.367	0.472	0.400	0.326	0.278	0.213	0.223
Recycling Production	0.152	0.162	0.174	0.186	0.197	0.207	0.217	0.230	0.242	0.254	0.266	0.277
Surface Production	0.225	0.175	0.154	0.194	0.195	0.151	0.115	0.116	0.115	0.081	0.068	0.081
Total Local Supply	2.131	2.149	2.208	2.156	2.455	2.290	2.081	2.159	2.122	2.200	2,146	2.027
Total MWD Demand	1.755	2.162	1.894	1.591	1.989	2.147	2.253	2.324	2.450	2.569	2.741	2.684
MWD Supply Sources												
Colorado River Aqueduct Supply	1.200	1.200	1.200	1,200	1.200	1.200	1.200	1.200	**1.200**	1.200	1.200	1.200
State Water Project Supply	1.561	1.441	1.725	1.886	1.643	1.590	1.441	1.292	0.611	1.285	0.877	0.389
MWD Cyclic Groundwater Deliveries	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.060	0.060	0.060
Eastside Reservoir	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.199	0.024	0.222	0.209
Arvin/Semitropic Groundwater Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.115	0.000	0.122	0.104
Long-term Seasonal Demand Cuts	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.131	0.000	0.164	0.154
Cyclic Benefits	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contractual Groundwater Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.133	0.000	0.095	0.085
DWR Reservoirs (Monterey Agreement)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.216
Voluntary Conservation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.235
MWD Ag Cuts	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032
Central Valley Transfers	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Storage Puts	1.006	0.260	0.344	0.240	0.200	0.200	0.388	0.168	0.000	0.000	0.000	0.000
Remaining Shortage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Water Supply Allocation Plan



December 2014 Revision

Metropolitan Water District of Southern California

ATTACHMENT B

Inside cover: Photo courtesy of Cora Edmonds/ArtXchange for the Healing Planet

Water Supply Allocation Plan

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List of Acronyms

AF – Acre-feet
CUP – Groundwater Conjunctive Use Program
CWD – County Water District
DWP – Drought Management Plan
IAWP – Interim Agricultural Water Program Reductions and Rates
IICP – Incremental Interruption and Conservation Plan
IRP – Integrated Resources Plan
GPCD – Gallons per Capita per Day
M&I – Municipal and Industrial
MWD – Municipal Water District
RUWMP – Regional Urban Water Management Plan
SWP – State Water Project
WSAP – Water Supply Allocation Plan
WSDM – Water Surplus and Drought Management

Definitions

Extraordinary Supplies- Deliberate actions taken by member agencies to augment the total regional water supply only when Metropolitan is allocating supplies through the WSAP.

Groundwater Recovery- The extraction and treatment of groundwater making it usable for a variety of applications by removing high levels of chemicals and/or salts.

In-lieu deliveries- Metropolitan-supplied water bought to replace water that would otherwise be pumped from the groundwater basins.

Seawater Barrier- The injection of fresh water into wells along the coast to protect coastal groundwater basins from seawater intrusion. The injected fresh water acts like a wall, blocking seawater that would otherwise seep into groundwater basins as a result of pumping.

Section 1: Introduction

Calendar Year 2007 introduced a number of water supply challenges for the Metropolitan Water District of Southern California (Metropolitan) and its service area. Critically dry conditions affected all of Metropolitan's main supply sources. In addition, a ruling in the Federal Courts in August 2007 provided protective measures for the Delta Smelt in the Sacramento-San Joaquin River Delta which brought uncertainty about future pumping operations from the State Water Project. This uncertainty, along with the impacts of dry conditions, raised the possibility that Metropolitan would not have access to the supplies necessary to meet total firm demands[1] and would have to allocate shortages in supplies to the member agencies.[2]

In preparing for this possibility, Metropolitan staff worked jointly with the member agency managers and staff to develop a Water Supply Allocation Plan (WSAP). The WSAP includes the specific formulas for calculating member agency supply allocations and the key implementation elements needed for administering an allocation should a shortage be declared. The WSAP became the foundation for the urban water shortage contingency analysis required under Water Code Section 10632 and was incorporated into Metropolitan's 2010 Regional Urban Water Management Plan (RUWMP).

Section 2: Development Process

Member Agency Input

Between July 2007 and February 2008, Metropolitan staff worked cooperatively with the member agencies through a series of member agency manager meetings and workgroups to develop a formula and implementation plan to allocate supplies in case of shortage. These workgroups provided an arena for in-depth discussion of the objectives, mechanics, and policy aspects of the different parts of the WSAP. Metropolitan staff also met individually with fifteen member agencies for detailed discussions of the elements of the recommended proposal. Metropolitan introduced the elements of the proposal to many nonmember retail agencies in its service area by providing presentations and feedback to a number of member agency caucuses, working groups, and governing boards. The discussions, suggestions, and comments expressed by the member agencies during this process contributed significantly to the development of this WSAP.

Board of Directors Input

Throughout the development process Metropolitan's Board of Directors was provided with regular progress reports on the status of this WSAP, with oral reports in September, October, and December 2007, an Information Board of Directors Letter with a draft of the WSAP in November 2007, and a Board of Directors Report with staff recommendations in January 2008. Based on Water Planning and Stewardship Committee discussion of the staff recommendations and further review of the report by

[1] Firm demands are also referred to as uninterruptable demands; likewise non-firm demands are also called interruptible demands.
[2] See Appendix A: Metropolitan Member Agencies.

the member agencies, refinements were incorporated into the WSAP for final consideration and action in February 2008. The WSAP was adopted at the February 12, 2008 Board of Directors meeting.[3]

The 12-Month Review Process

When the Board adopted the WSAP in February 2008, the decision specified a formal revisit of the WSAP commencing in February 2010. The scheduled revisit was meant to ensure the opportunity for Metropolitan staff and the member agencies to re-evaluate the WSAP and recommend appropriate changes to the Board of Directors.

In April 2009, the Board voted to implement the WSAP for the first time. The WSAP was implemented at a Level 2 allocation level, and was in effect for the period of July 1, 2009, through June 30, 2010. Since implementation of the 2009/10 WSAP began in July 2009, a number of practical issues relating to the WSAP were identified by staff and the member agencies for further consideration during the 12-Month Review Process. Metropolitan staff engaged with the member agencies in a formal review of the WSAP from January through May 2010. During the review process the member agency managers participated in a series of six workshops. The focus of these workshops was to facilitate in-depth discussion on WSAP-related issues and lessons learned since the WSAP was implemented in July 2009. The proposed adjustments to the WSAP developed during the review process were adopted at the August 17, 2010 Board of Directors meeting[4].

The Three-Year Review Process

The Board action to adopt of the WSAP in February 2008 also directed staff to review the WSAP formula three years after the February 2008 adoption. February 2011 marked the three-year anniversary since the adoption of the WSAP. Similar to the 12-Month Review Process, the purpose of the Three-Year Review Process was to provide an opportunity for Metropolitan staff and the member agencies to re-evaluate the plan and recommend appropriate changes for board consideration.

Metropolitan staff met with the member agencies in a formal review of the WSAP from February through August 2011. Staff and member agency managers participated in a series of eleven workshops. Proposed adjustments to the WSAP developed during the process were adopted at the September 13, 2011 Board of Directors meeting.[5]

[3] A complete listing of member agency meetings and Board of Directors reporting activities is contained in Appendix B: Water Supply Allocation Plan Process Timeline.

[4] A complete listing of member agency meetings and Board of Directors reporting activities is contained in Appendix C: 12-Month Review Process and Results.

[5] A complete listing of member agency meetings and Board of Directors reporting activities is contained in Appendix D: Three-Year Review Process and Results.

2014 Review Process

In 2014, California was challenged with a third year of severe drought.[6] Metropolitan managed its operations through significant use of regional storage reserves. It was anticipated that end of year total dry storage reserves would approach levels similar to those when the WSAP was last implemented in 2009.

Following discussion at the June 2014 Water Planning and Stewardship Committee, Metropolitan staff convened a member agency working group to revisit the WSAP. The purpose of the working group was to collaborate with member agencies to identify potential revisions to the WSAP in preparation for mandatory supply allocations in 2015. There were eight working group meetings and three discussions at the monthly Member Agency Managers' Meetings.

The process focused on three areas of the WSAP: the Base Period, the Allocation Formula, and the Allocation enforcement mechanism. Proposed adjustments to the WSAP developed during the process were adopted at the December 9, 2014 Board of Directors meeting. [7]

[6] The Governor of California proclaimed a State of Emergency due to drought conditions on January 17, 2014 and, on April 24, 2014 issued an Executive Order proclaiming a continued State of Emergency noting drought conditions have persisted for the last three years and authorizing adoption and implementation of emergency regulations.

[7] A complete listing of member agency meetings and Board of Directors reporting activities is contained in Appendix E: 2014 Review Process and Results.

Section 3: Review of Historical Shortage Plans[8]

The WSAP incorporates key features and principles from the following historical shortage allocation plans but will supersede them as the primary and overarching decision tool for water shortage allocation.

Interruptible Water Service Program

As part of the new rate structure implemented in 1981, Metropolitan's Board of Directors adopted the Interruptible Water Service Program (Interruptible Program) which was designed to address short-term shortages of imported supplies. Under the Interruptible Program, Metropolitan delivered water for particular types of use to its member agencies at a discounted rate. In return for this discounted rate, Metropolitan reserved the right to interrupt delivery of this Interruptible Program water so that available supplies could be used to meet municipal and industrial demands.

Incremental Interruption and Conservation Plan

The ability to interrupt specific deliveries was an important element of Metropolitan's strategy for addressing shortage conditions when it adopted the Incremental Interruption and Conservation Plan (IICP) in December 1990. Reductions in IICP deliveries were used in concert with specific objectives for conservation savings to meet needs during shortages. The IICP reduced Interruptible Service deliveries in stages and provided a pricing incentive program to insure that reasonable conservation measures were implemented.

1995 Drought Management Plan

The 1995 Drought Management Plan (DMP) was a water management and allocation strategy designed to match supply and demand in the event that available imported water supplies were less than projected demands. Adopted by the Metropolitan Board of Directors in November 1994, the 1995 DMP was a short-term plan designed to provide for the 1995 calendar year only. The primary objective of the 1995 DMP was to identify methods to avoid implementation of mandatory reductions. The 1995 DMP included various phases and a step-by-step strategy for evaluating supply and demand conditions and utilizing Metropolitan's available options, with the final phase being implementation of the revised IICP.

1999 Water Surplus and Drought Management Plan

Metropolitan staff began work on the Water Surplus and Drought Management (WSDM) Plan in March 1997 as part of the Integrated Water Resources Plan (IRP), which was adopted by Metropolitan's Board of Directors in January 1996. The IRP established regional water resource targets, identifying the need for developing resource management policy to guide annual operations. The WSDM Plan defined Metropolitan's resource management policy by establishing priorities for the use of regional resources to achieve the region's reliability goal identified in the IRP. In April 1999, Metropolitan's Board of Directors adopted the WSDM Plan.

[8] A summary of the key elements in the following allocation plan is found in Appendix F: Summary of Historical Shortage Plans.

The WSDM Plan also included a set of principles and considerations for staff to address when developing specific allocation methods. The WSDM Plan stated the following guiding principle to be followed in developing any future allocation scheme:

> *"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 periods of shortage."*[9]

This principle reflects a central desire for allocation methods that are both equitable and minimize regional hardship to retail water consumers. The specific considerations postulated by the WSDM Plan to accomplish this principle include the following:[10]

- The impact on retail customers and the economy
- Allowance for population and growth
- Change and/or loss of local supply
- Reclamation/Recycling
- Conservation
- Investment in local resources
- Participation in Metropolitan's interruptible programs
- Investment in Metropolitan's facilities.

Section 4: Water Supply Allocation Formula

Based on the guiding principle and considerations described in the WSDM Plan, Metropolitan staff and the member agencies developed a specific formula for allocating water supplies in times of shortage. The formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level, and takes into account growth, local investments, changes in supply conditions and the demand hardening[11] aspects of non-potable recycled water use and the implementation of conservation savings programs. The formula, described below, is calculated in three steps: base period calculations, allocation year calculations, and supply allocation calculations.[12] The first two steps involve standard computations, while the third section contains specific methodology developed for this WSAP.

Base Period Calculations

The first step in calculating a water supply allocation is to estimate water supply and demand using a historical base period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from the fiscal years (July through June) ending 2013 and 2014.[13]

[9] WSDM Plan, p. 1. Emphasis added.
[10] WSDM Plan, p. 2.
[11] Demand hardening is the effect that occurs when all low-cost methods of decreasing overall water demand have been applied (e.g., low-flow toilets, water recycling) and the remaining options to further decrease demand become increasingly expensive and difficult to implement.
[12] Detailed operational elements of these objectives and a numerical example are discussed in Appendix G: Water Supply Allocation Formula Example.
[13] Exceptions to this methodology are noted in the descriptions of base period calculations.

Base Period Local Supplies: Local supplies for the base period are calculated using a two-year average of groundwater production, groundwater recovery, Los Angeles Aqueduct supply, surface water production, and other imported supplies. Non-potable recycling production is not included in this calculation due to its demand hardening effect.

Base Period Wholesale Demands: Demands on Metropolitan for the base period are calculated using a two-year average of firm purchases and in-lieu deliveries to long-term groundwater replenishment, conjunctive use, cyclic, and supplemental storage programs.

Base Period Retail Demands: Total retail-level municipal and industrial (M&I) demands for the base period are calculated by adding the Base Period Wholesale Demands and the Base Period Local Supplies. This estimates an average total demand for water from each agency.

Base Period Mandatory Conservation Credit: Metropolitan allows a consultation process that enables member agencies to describe mandatory water use restrictions and/or rationing restrictions that were in place within their service areas during the Base Period. Restrictions may vary among agencies but include restricted water uses, fines, and water budget or penalty based rate structures that are enacted by the governing body of the member agency or retail agency. Following the consultation process, Metropolitan staff will recommend adjustments based on evidence of reduced GPCD. To qualify for an adjustment, GPCD reductions would have to be observed that are beyond those expected from the agency's ongoing conservation efforts and trends.

Allocation Year Calculations

The next step in calculating the water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population or economic growth and changes in local supplies.

Allocation Year Retail Demands: Total retail M&I demands for the allocation year are calculated by adjusting the Base Period Retail Demands for baseline inflation and growth.

Baseline Inflation Adjustment: Baseline inflation occurs when non-potable recycling or conservation is developed after the Base Period. The development of these supplies reduces actual demands for water in the Allocation Year. Because non-potable-recycling and conservation are excluded from the WSAP formula, the actual need for water in the Allocation year is overestimated. The Baseline Inflation Adjustment removes increases in non-potable recycling and conservation annually from the Base Period forward to better reflect the true need for water in the Allocation Year.

Growth Adjustment: The growth adjustment is calculated using the estimated actual annual rate of population growth at the county level, as generated by the California Department of Finance, whenever possible. For years without complete data, the growth rate is calculated using an average of the three most recent years available. Growth will be allocated based on historical per capita water use during the Base Period, with a cap equal to Metropolitan's IRP Target for Water Use Efficiency. For

allocation years up to and including 2014, the cap will be 163 GPCD, and for allocation years 2015-2020 the cap will reduce linearly from 163 to 145 GPCD. On an appeals basis, member agencies may request that their adjustment be calculated using member agency level population growth. A weighted combination of actual population and actual employment growth rates may also be requested.

Allocation Year Local Supplies: Allocation Year Local Supplies include groundwater production, groundwater recovery, Los Angeles Aqueduct supply, surface water production, seawater desalination, and other imported supplies. Estimates of Allocation Year Local Supplies are provided by the member agencies upon implementation of a WSAP. If estimates are not provided, Metropolitan will use the sum of the Base Period Local Supplies and Base Period In-Lieu Deliveries as a default. Agencies may provide updated estimates at any time during the Allocation Year to more accurately reflect their demand for Metropolitan supplies.

Extraordinary Supplies: Under the WSAP formula, local supply production in the Allocation Year can either be designated as a "planned" supply, or as an "extraordinary" supply.[14] This is an important designation for a member agency because the two types of supplies are accounted for differently in the WSAP formula. Local supplies classified at Extraordinary Supply are only partially included (scaled depending on the WSAP Level) as local supplies. This has the effect of providing significantly more benefit to the member agency in terms of total water supply that is available to the retail customer.[15]

Allocation Year Wholesale Demands: Demands on Metropolitan for the allocation year are calculated by subtracting the Allocation Year Local Supplies from the Allocation Year Retail Demands.

Water Supply Allocation Calculations

The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. The following table displays the elements that form the basis for calculating the supply allocation. Each element and its application in the allocation formula are discussed below.

Table 1: Shortage Allocation Index

(a) Regional Shortage Level	(b) Wholesale Minimum Percentage	(c) Maximum Retail Impact Adjustment Percentage
1	92.5%	2.5%
2	85.0%	5.0%
3	77.5%	7.5%
4	70.0%	10.0%

[14] Appendix H: Board Policy Principles on Determining the Status of Extraordinary Supply lists the key Board principles used in determining if a supply qualifies as an Extraordinary Supply.
[15] See Appendix G: Water Supply Allocation Formula Example for specific allocation formulae.

5	62.5%	12.5%
6	55.0%	15.0%
7	47.5%	17.5%
8	40.0%	20.0%
9	32.5%	22.5%
10	25.0%	25.0%

Regional Shortage Level: The WSAP formula allocates shortages of Metropolitan supplies over ten levels.

Wholesale Minimum Allocation: The Wholesale Minimum Allocation ensures a minimum level of Metropolitan supplied wholesale water service to each member agency.

Maximum Retail Impact Adjustment: The purpose of this adjustment is to ensure that agencies with a high level of dependence on Metropolitan do not experience disparate shortages at the retail level compared to other agencies when faced with a reduction in wholesale water supplies. The Maximum Retail Impact Percentage is prorated on a linear scale based on each member agency's dependence on Metropolitan at the retail level. This percentage is then multiplied by the agency's Allocation Year Wholesale Demand to determine an additional allocation.

Conservation Demand Hardening Credit: The Conservation Demand Hardening Credit addresses the increased difficulty in achieving additional water savings at the retail level that comes as a result of successful implementation of water conserving devices and conservation savings programs. To estimate conservation savings, each member agency will establish a historical baseline Gallons Per Person Per Day (GPCD) calculated in a manner consistent with California Senate Bill SBx7-7.[16] Reductions from the baseline GPCD to the Allocation Year are used to calculate the equivalent conservation savings in acre-feet. The Conservation Demand Hardening Credit is based on an initial 10 percent of the GPCD-based Conservation savings plus an additional 5 percent for each level of Regional Shortage set by the Board during implementation of the WSAP. The credit will also be adjusted for:

- The overall percentage reduction in retail water demand
- The member agency's dependence on Metropolitan

The credit is calculated using the following formula:

Conservation Demand Harding Credit = Conservation Savings x (10% + Regional Shortage Level Percentage) x (1 +((Baseline GPCD – Allocation Year GPCD)/Baseline GCPD)) x Dependence on MWD Percentage

[16] California Department of Water Resources, February 2011, "Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use. Available at: http://www.water.ca.gov/wateruseefficiency/sb7/docs/MethodologiesCalculatingBaseline_Final_03_01_2011.pdf

This provides a base demand hardening credit equal to 10 percent of conservation savings and increases the credit as deeper shortages occur, which is when conservation demand hardening has a bigger impact on the retail consumer. The credit also increases based on the percentage of an agency's demand that was reduced through conservation. This accounts for increased hardening that occurs as increasing amounts of conservation are implemented. Lastly, the credit is scaled to the member agency's dependence on Metropolitan to ensure that credits are being applied to the proportion of water demand that is being affected by reductions in Metropolitan supply.

Minimum Per-Capita Water Use Credit: This adjustment creates a minimum per capita water use threshold. Member agencies' retail-level water use is compared to two different thresholds. The proposed minimum thresholds are based upon compliance guidelines established under Senate Bill X7-7.

- 100 GPCD total water use
- 55 GPCD residential water use

Agencies that fall below either threshold under the WSAP will receive additional allocation from Metropolitan to bring them up to the minimum GPCD water use level. If an agency qualifies under both thresholds, the one resulting in the maximum allocation adjustment will be given.[17] To qualify for this credit, member agencies must provide documentation of the total agency level population and the percent of retail level demands that are residential; no appeal is necessary.

Total WSAP Allocation: The allocation to an agency for its M&I retail demand is the sum of the Wholesale Minimum Allocation, the Retail Impact Adjustment, the Conservation Demand Hardening Credit, and the Minimum Per-Capita Water Use Credit.[18]

Total Metropolitan Supply Allocations: In addition to the WSAP Allocation described above, agencies may also receive separate allocations of supplies for and seawater barrier and groundwater replenishment demands. Allocations of supplies to meet seawater barrier demands are to be determined by the Board of Directors independently but in conjunction with the WSAP. Separating the seawater barrier allocation from the WSAP allocation allows the Board to consider actual barrier requirements in the Allocation Year and address the demand hardening issues associated with cutting seawater barrier deliveries. According to the principles outlined for allocating seawater barrier demands, allocations should be no deeper than the WSAP Wholesale Minimum Percentage implemented at that time.

The WSAP also provides a limited allocation for drought-impacted groundwater basins based on the following framework:[19]

[17] See Appendix J: Per Capita Water Use Minimum Example for specific minimum per-capita water use credit formulae and example.
[18] See Appendix G: Water Supply Allocation Formula Example for specific allocation formulae.
[19] See Appendix L: Groundwater Replenishment Allocation for more information.

1. Metropolitan staff will hold a consultation with the requesting member agency and the appropriate groundwater basin manager to document whether the basin is in one of the following conditions:
    a. Groundwater basin overdraft conditions that will result in water levels being outside normal operating ranges during the WSAP allocation period; or
    b. Violations of groundwater basin water quality and/or regulatory parameters that would occur without imported deliveries
2. An allocation is provided based on the verified need for groundwater replenishment. The allocation would start with a member agency's ten-year average purchases of imported groundwater replenishment supplies (excluding years in which deliveries were curtailed). The amount would then be reduced by the declared WSAP Regional Shortage Level.

Section 5: WSAP Implementation

The WSAP will take effect if a regional shortage is declared by the Board of Directors. The following implementation elements are necessary for administering the WSAP during a time of shortage. These elements cover the processes needed to declare a regional shortage level as well as provide information pertaining to the allocation surcharge.

Allocation Period

The allocation period covers twelve consecutive months, from July of a given year through the following June. This period was selected to minimize the impacts of varying State Water Project (SWP) allocations and to provide member agencies with sufficient time to implement their outreach strategies and rate modifications.

Setting the Regional Shortage Level

Metropolitan staff is responsible for recommending a Regional Shortage Level for the Board of Directors' consideration. The recommendation shall be based on water supply availability, and the implementation of Metropolitan's water management actions as outlined in the WSDM Plan. Metropolitan staff will keep the Board of Directors apprised to the status of water supply conditions and management actions through monthly reports to the Water Planning and Stewardship Committee. To further facilitate staff in the development of a recommended regional shortage level, member agency requests for local supply adjustments shall be submitted by April 1st.

Metropolitan's Board of Directors, through the Water Planning and Stewardship Committee, is responsible for approving the final Regional Shortage Level at its April meeting. By the April meeting, the majority of the winter snowfall accumulation period will have passed and will allow staff to make an allocation based on more stable water supply estimates. Barring unforeseen large-scale circumstances, the Regional Shortage Level will be set for the entire allocation period, which will provide the member agencies an established water supply level for their planning.

Exit Strategy

While the Board ultimately has discretion to implement or lift and allocation at any point of time during the year; the WSAP includes a two-part exit strategy that is meant to streamline the WSAP implementation decision making process.

- If the Board decides to implement the WSAP, then any current WSAP allocation would remain in place until the end of the Allocation Year.
- If the Board decides not to implement the WSAP, then any current WSAP allocation would be terminated concurrent with the Board decision.

Allocation Appeals Process

An appeals process is necessary for the administration of any changes or corrections to an agency's allocation. Metropolitan's General Manager will designate, subsequent to a declaration of an allocation by the Board of Directors, an Appeals Liaison as the official point of contact for all information and inquiries regarding appeals. All member agency General Managers will be notified in writing of the name and contact information of the Appeals Liaison. Only appeals that are made through the Appeals Liaison and in accordance with the provisions outlined in Appendix N: Allocation Appeals Process will be evaluated. Basis for appeals claims can include but are not limited to:

- Adjusting erroneous historical data used in base period calculations
- Adjusting for population growth rates
- Determining if a local supply qualifies as Extraordinary Supply

Additional details and a checklist for the appeals process are available in Appendix N: Allocation Appeals Process and Appendix O: Appeals Submittal Checklist.

Allocation Surcharge

Member agency allocations are supported by an Allocation Surcharge. The Allocation Surcharge is charged to water use above the Member Agency allocation and is charged in addition to Metropolitan's standard rates for water service. Allocation Surcharges will only be assessed to the extent that an agency's total annual usage exceeds its total annual allocation. Any revenues collected through the Allocation Surcharge will be applied towards Metropolitan's Water Management Fund, which is used to in part to fund expenditures in dry-year conservation. No billing or assessment of allocation surcharges rates will take place until the end of the twelve-month allocation period.

Allocation Surcharge: The application of the Allocation Surcharge structure is a two tier structure that provides a lower level of Allocation Surcharge for minor overuse of allocations and a higher level of Allocation Surcharge for major overuse of allocations. The structure and applicable Allocation Surcharges are listed in Table 2.

Table 2: Allocation Surcharge			
Water Use	**Base Water Rate[20]**	**Allocation Surcharge[21]**	**Total Rate**
100% of Allocation	Tier 1	0	Tier 1
Between 100% and 115%	Tier 1	$1,480	Tier 1 + ($1,480)
Greater than 115%	Tier 1	$2,960	Tier 1 + ($2,960)

Qualifying Income-Based Rate Allocation Surcharge Adjustment:[22] Any Allocation Surcharges incurred by a member agency under the WSAP will be adjusted to reflect the extent to which retail customers within a member agency's service area are served under a "lifeline" or similar qualified discounted rate program based on income or ability to pay ("Income-Based Rate").

Any member agency who is assessed Allocation Surcharges under the WSAP may submit an acre-foot equivalent of water used by retail customers served under a qualifying Income-Based Rate.[23] This amount of water use would be multiplied by the percentage of retail-level reduction in allocation year demand necessary for that member agency to avoid exceeding its WSAP allocation. The monetary amounts resulting from these acre feet are subtracted from the total monetary amounts incurred by an agency for exceeding its allocation. In the case that the monetary amounts associated with the Income-Based Rate are greater than the total Allocation Surcharges an agency incurs, no Allocation Surcharges will be incurred. The end result of this adjustment is that the member agency will not be subject to Allocation Surcharges for the use of water by their retail customers served under a qualifying Income-Based Rate.

Growth Rate Allocation Surcharge Adjustment": In recognition of member agency differences in geography and climate, a Growth Rate Allocation Surcharge Adjustment will be given to any agency that exceeds its WSAP Allocation. The Allocation Surcharge reduction will be based on the difference in acre-feet between the Growth Adjustment applied at Metropolitan's IRP planning goal rate, and the greater of the following:

- The IRP planning goal rate adjusted for the member agency's ETo, or
- The member agency's certified and documented 20x2020 targeted GPCD

If both of these alternatives result in a lower growth adjustment than the IRP planning goal, no Allocation Surcharge reduction will be made.

[20] The base water rate shall be the applicable water rate for the water being purchased. In most cases, it will be the Tier 1 rate (plus Treatment Surcharge for treated water deliveries). However, it is possible that the water being purchased would be in the amount that would put an agency beyond its Tier 1 limit. In that case, the base water rate will be the Tier 2 rate (plus Treatment Surcharge for treated water deliveries).
[21] Allocation Surcharge is applied to water use in excess of an agency's WSAP allocation.
[22] See Appendix K: Qualifying Income-Based Rate Allocation Surcharge Adjustment Example for specific penalty adjustment formulae and example.
[23] Appropriate documentation and certification will be required.

Tracking and Reporting

Subsequent to a declared regional shortage by the Board of Directors, Metropolitan staff will produce monthly reports of each member agency's water use compared to its allocations based on monthly delivery patterns to be submitted by the member agency. In order to produce these reports, member agencies are requested to submit their local supply use on a monthly basis and certify end of allocation year local supply use. These reports and comparisons are to be used for the purposes of tracking and communicating potential underage/overage of an agency's annual allocations.

Key Dates for Water Supply Allocation Implementation

The timeline for implementation of an allocation is shown in Table 3. A brief description of this timeline follows:

January to March: Water Surplus and Drought Management reporting occurs at Metropolitan's Water Planning and Stewardship Committee meetings. These reports will provide updated information on storage reserve levels and projected supply and demand conditions.

April: Member agencies report their projected local supplies for the coming allocation year. This information is incorporated in staff analysis of storage reserves and projected supply and demand conditions in order to provide an allocation recommendation to the Board. Metropolitan's Board will consider whether an allocation is needed. A declaration of an allocation will include the level of allocation to be in effect for the allocation year. Likewise, member agencies will report their projected demands and local supplies needed to meet seawater barrier and groundwater replenishment requirements for the allocation year. Metropolitan's Board will consider whether allocations for seawater barrier demands and groundwater replenishment demands are needed independently from the WSAP allocation decision.**July 1st**: If the Board declared an allocation in April, then it will be effective starting July 1st. The allocation level will be held through June 30th, barring unforeseen circumstances. Member agencies will now be requested to submit their local supply use on a monthly basis and certify end of allocation year local supply use. Local production data must be reported to Metropolitan by the end of the month following the month of use (use in July must be reported by the end of August). This information will be combined with Metropolitan sales information in order to track retail water use throughout Metropolitan's service area. Each month Metropolitan will report on member agency water sales compared to their allocation amounts.

June 30th: The allocation year is complete.

July: Member agency local supplies must be certified for the month of June, the last month of the previous allocation year.

August: Metropolitan will calculate each member agency's total potable water use based on local supply certifications and actual sales data for the allocation year of July through June. Allocation surcharges will be assessed for usage above a given member agency's final adjusted allocation (reflecting the actual local supply and imported water use that occurred in the allocation year).

Table 3: Board Adopted Allocation Timeline					
Year	**Month**	**Year 1 Board Decision**	**Year 1 Allocation Year**	**Year 2 Board Decision**	**Year 2 Allocation Year**
Year 1	January				
	February				
	March				
	April	Declaration *			
	May		**Effective Period** Continuous Tracking of Member Agency Local Supply and Imported Water Use		
	June				
	July				
	August				
	September				
	October				
	November				
	December				
Year 2	January				
	February				
	March				
	April			Declaration *	
	May				
	June				
	July				**Effective Period** Continuous Tracking of Member Agency Local Supply and Imported Water Use
	August		Assess		
	September				
	October				
	November				
	December				
Year 3	January				
	February				
	March				
	April				
	May				
	June				

*Member agency projections of local supplies are due on April 1st to assist Metropolitan staff in determining the need for an allocation in the coming allocation year.

Appendix A: Metropolitan Member Agencies

Table 4: Member Agencies		
City of Anaheim	City of Glendale	City of San Marino
City of Beverly Hills	Inland Empire Utilities Agency	City of Santa Ana
City of Burbank	Las Virgenes MWD	City of Santa Monica
Calleguas MWD	City of Long Beach	Three Valleys MWD
Central Basin MWD	City of Los Angeles	City of Torrance
City of Compton	MWD of Orange County	Upper San Gabriel MWD
Eastern MWD	City of Pasadena	West Basin MWD
Foothill MWD	San Diego CWA	Western MWD
City of Fullerton	City of San Fernando	

Source: http://mwdh2o.com/WhoWeAre/Member-Agencies/

Appendix B: Water Supply Allocation Plan Process Timeline

July 2007

- City of Long Beach Water Department staff briefing
- Member Agency Managers/Member Agency Workgroup meeting
- Northern Managers Group meeting
    - Foothill MWD, City of Pasadena, City of Long Beach, Calleguas MWD, City of Los Angeles, West Basin MWD, City of Burbank, Three Valleys MWD, City of Glendale, Upper San Gabriel MWD

August 2007

- Central Basin MWD staff briefing
- Eastern MWD staff briefing
- San Diego CWA staff briefing
- Member Agency Managers/Member Agency Workgroup meeting
- Western MWD staff briefing
- City of Beverly Hills staff briefing

September 2007

- Member Agency Subgroup meetings
    - MWD of Orange County, San Diego CWA, West Basin MWD, Central Basin MWD
- MWD of Orange County staff briefing
- Member Agency Workgroup meeting
- Member Agency Workgroup meeting
- MWD Board of Directors Oral Report

October 2007

- Inland Empire Utilities Agency staff briefing
- Central Basin MWD Caucus Meeting (included sub-agencies)
- Three Valleys MWD staff briefing
- MWD of Orange County staff briefing
- West Basin MWD staff briefing
- MWD Board of Directors Oral Report

November 2007

- West Basin MWD Caucus Meeting (included sub-agencies)
- West Basin Water Users Association presentation
- Walnut Valley MWD staff briefing (sub-agency of Three Valleys MWD)
- Foothill MWD Managers Meeting (included sub-agencies)
- Central Basin MWD staff briefing
- City of Claremont City Council (sub-agency of Three Valleys MWD)
- MWD Board of Directors Information Letter with Draft Proposal

December 2007

- Northern Managers Group Meeting
- California Department of Public Health staff briefing
- City of Long Beach Water Department staff briefing
- Santa Ana River Watershed Project Authority presentation
- Foothill MWD Managers Meeting (included sub-agencies)
- MWD Board of Directors Oral Report

January 2008

- Northern Managers Group Meeting
- Water Replenishment District Board of Directors presentation
- Three Valleys MWD staff briefing
- Member Agency Conservation Coordinator's Group presentation
- Member Agency Managers/Member Agency Workgroup meeting
- City of Chino Hills presentation (sub-agency of IEUA)
- Member Agency Workgroup meeting
- Hemet/San Jacinto Exchange Club presentation
- MWD Board of Directors Report with Staff Recommended Water Supply Allocation Plan

February 2008

- MWD of Orange County and Irvine Ranch WD staff briefing
- MWD Board of Directors Action Item
- San Gabriel Valley Water Association Meeting
- Orange County Water Policy Meeting
- SCAG Water Policy Task Force Meeting

Appendix C: 12-Month Review Process and Results

January 2010

- WSAP 12-Month Review Process workshop #1
  - Focused discussion of WSAP issues identified by Metropolitan staff and by member agencies since the July 2009 implementation began.

February 2010

- WSAP 12-Month Review Process workshop #2
  - Continuation of focused discussion
- WSAP 12-Month Review Process workshop #3
  - Continuation of focused discussion

March 2010

- WSAP 12-Month Review Process workshop #4
  - Continuation of focused discussion
- MWD Board of Directors information item
  - Review of potential modifications to the WSAP definition of Extraordinary Supply

April 2010

- WSAP 12-Month Review Process workshop #5
  - Recap of identified issues and discussion of Metropolitan staff proposals for adjustments to the WSAP
- Member Agency Managers Meeting
  - Update on the 12-Month Review Process
- WSAP 12-Month Review Process workshop #6
  - Discussion of WSAP issues related to groundwater replenishment
- Member Agency Managers conference call
  - Clarification of WSAP definition for Extraordinary Supply

May 2010

- Member Agency Managers Meeting
  - Discussion of proposed Extraordinary Supply policy principles and WSAP Local Supply certification process.
- Member Agency Managers conference call
  - Discussion of proposed Extraordinary Supply policy principles

June 2010

- MWD Board of Directors action item

July 2010

- MWD Board of Directors information item
  - Review of proposed adjustments to the WSAP developed in the 12-Month Review Process

August 2010

- MWD Board of Directors action item

Resulting Changes

- Removed references to Gains and Losses of Local Supply
    - Removed references in the WSAP to "gains and losses of local supplies" in order to better facilitate the accounting of historical base year and allocation year local supplies. This change did not affect the WSAP formula or allocations.
- Removed references to the Regional Shortage Percentage
    - Removed references to the "Regional Shortage Percentage" in the WSAP to reduce unintended confusion between calculation factors and shortage amounts. This change did not affect the WSAP formula or allocations.
- Included the Retail Impact Adjustment in all shortage levels
    - Included the Retail Impact Adjustment for Regional Shortage Levels 1 and 2. This change results in additional allocations to Metropolitan-dependent agencies under Level 1 and Level 2 regional shortages.
- Revised the accounting of Extraordinary Supplies
    - Revised the methodology for accounting of Extraordinary Supply in the WSAP formula by:
        - Removing the Base Period Local Supply threshold provision,
        - Removing the sliding-scale sharing mechanism from the formula, and
        - Including the full amount of the Extraordinary Supply in the calculation of the Retail Impact Adjustment.
- Included a Minimum Per Capita Water Use Threshold
    - Developed a minimum water use credit based on two GPCD water use thresholds. Member agencies would receive additional Metropolitan allocation for an acre-foot equivalent of GPCD below the minimum threshold. Member agency water use, on a gallon per capita per day (GPCD) basis, is compared to the following minimum thresholds established under Senate Bill X7-7 (Water Conservation Act of 2009)
        - 100 GPCD total use or
        - 55 GPCD residential indoor use
- Excluded Seawater Barrier from the WSAP Formula
    - Excluded seawater barrier supplies from the WSAP Base Period and Allocation Year local supply calculations. This allows the Board to determine allocations for seawater barrier demands separately from the WSAP.

Appendix D: Three-Year Review Process and Results

February 2011

- WSAP 3-Year Review Process workshop #1
  - Review of the existing WSAP policy formula; review of the process timeline; and focused discussion of WSAP issues identified by Metropolitan staff and by member agencies since the WSAP's adoption in February 2008

March 2011

- WSAP 3-Year Review Process workshop #2
  - Discussion of issues related to local supplies and baseline inflation due to adjustments for recycling in the WSAP formula
- WSAP 3-Year Review Process workshop #3
  - Continuation of prior workshop

April 2011

- WSAP 3-Year Review Process workshop #4
  - Discussion of issues and alternatives related to base period selection and baseline inflation in the WSAP formula
- WSAP 3-Year Review Process workshop #5
  - Discussion of recommendations to address baseline inflation in the WSAP formula

May 2011

- WSAP 3-Year Review Process workshop #6
  - Discussion of issues and alternatives for the growth adjustment methodology in the WSAP formula
- WSAP 3-Year Review Process workshop #7
  - Continuation of prior workshop

June 2011

- WSAP 3-Year Review Process workshop #8
  - Continuation of prior workshop, discussion of WSAP implementation exit strategy
- WSAP 3-Year Review Process workshop #9
  - Continuation of exit strategy discussion, discussion of baseline inflation due to conservation and related conservation demand hardening issues

July 2011

- WSAP 3-Year Review Process workshop #9
  - Continued discussion of baseline inflation and conservation issues, and discussion of sharing allocations between agencies with common local resources

August 2011

- WSAP 3-Year Review Process workshop #10
  - Discussion of WSAP Allocation Year timing vs. Tier 1-Tier 2 rate cycle timing, discussion of approaches for encouraging completion of WSAP local supply certifications
- Review WSAP at Member Agency Managers Meeting
  - Discussion of proposed WSAP adjustments to address baseline inflation issues, revise the growth adjustment methodology, and establish a WSAP exit strategy

ATTACHMENT B

September 2011

- MWD Board of Directors action item

Resulting Changes

- Baseline Inflation Adjustment
    - Removed non-potable recycling and conservation from the WSAP baseline
        - Increases in recycling and conservation will be subtracted annually from the Base Period forward
        - The annual population growth rate will be applied after deducting the annual increases in recycling and conservation
        - If an agency ends up in allocation penalty, a penalty reduction will be applied in an amount equal to the Code-Based and rate Structure conservation savings that were removed from the WSAP baseline
- Changed the Growth Adjustment methodology
    - Growth will be allocated at historical per capita rate capped at the 2010 Integrated Water Resource Plan (IRP) Target for Water Use Efficiency
        - For years up to and including 2014, the cap will be 163 GPCD
        - For years 2015-2020, the cap will reduce linearly from 163 to 145 GPCD
    - If an agency exceeds its allocation, a penalty reduction will be applied based on either:
        - The differential Evapotranspiration (ETo) of its service area compared to the MWD average, or
        - Certified and documented 20 x 2020 targeted GPCD
- Exit Strategy
    - Clarified the course of action for an existing WSAP allocation when Metropolitan's Board makes a declaration decision for the following WSAP year
        - If there is an allocation for the next year, then the current allocation stays in place
        - If there is no allocation for the next year, then the current allocation is lifted concurrent with the April decision

Appendix E: 2014 Review Process and Results

July 2014

- WSAP Workgroup Meeting #1
  - First meeting of the 2014 WSAP Review process; review of the existing WSAP policy and formula; review of the process timeline; began discussion of issues related to base period selection
- WSAP Workgroup Meeting #2
  - Discussion of base period selection

August 2014

- WSAP Workgroup Meeting #3
  - Continuation of prior workshop discussion; comparison of base period alternatives

September 2014

- WSAP Workgroup Meeting #4
  - Discussion of a base period proposal; discussion of replenishment issues in the WSAP; discussion of 2015 water supply scenarios
- Review WSAP at Member Agency Managers Meeting
  - Review of WSAP workgroup process; discussion on issues related to base period, demand hardening, and local resources development
- WSAP Workgroup Meeting #5
  - Review of base period recommendation; discussion of issues regarding agencies in mandatory conservation during a base period; discussion on replenishment in the WSAP

October 2014

- WSAP Workgroup Meeting #6
  - Continuation of prior workshop discussion; discussion of alternative methods for conservation demand hardening credit; discussion of new and existing local supplies
- Review WSAP at Member Agency Managers Meeting
  - Review of WSAP workgroup process; discussion of issues related to base period and demand hardening

November 2014

- WSAP Workgroup Meeting #7
  - Review and discussion of issues and potential methods for base period selection and adjustment, replenishment allocation, and conservation demand hardening credit; review of estimated effects of potential WSAP changes at the regional level
- WSAP Workgroup Meeting #8
  - Review of proposed recommendations for the WSAP based on workgroup discussion
- Review WSAP at Member Agency Managers Meeting
  - Review of proposed recommendations for the WSAP based on workgroup discussion

Resulting Changes

- Base Period Update to FY2013 and FY2014
    - Changed the WSAP Base Period from calendar years 2004-2006 to fiscal years ending July 2013 and 2014
    - Mandatory Conservation Adjustment
        - Agencies with mandatory conservation in effect during the base period (FY 2013 and/or FY 2014) may qualify for a demand hardening adjustment, adjustment is subject to a consultation process that includes consideration historical demand and GPCD information

- Modify Conservation Demand Hardening Credit
    - Replaced device calculation-based estimates of conservation savings with a GPCD-based method
        - Conservation savings are calculated by comparing GPCD from a historical baseline to the Allocation Year; the difference is converted to acre-feet using the Allocation Year population.
            - Baseline GCPD is 10-year average ending between 2004 and 2010, with gross water, using gross water use minus non-potable recycled water production and documented historical population
    - Replaced formula for calculating the credit for each Regional Shortage Level
    - Conservation Demand hardening credit will be based on an initial 10 percent of GPCD-based conservation savings plus an additional 5 percent for each level of Regional Shortage; the credit will also be adjusted for the overall percentage reduction in retail water demand and the member agency's dependence on Metropolitan.
- Allocation Surcharge
    - Replaced the WSAP Penalty Rate with an Allocation Surcharge based on the estimated cost of Turf Replacement conservation programs

Appendix F: Summary of Historical Shortage Plans

These five elements incorporated into the WSAP have, in four out of five instances, been used in previous shortage plans. Both the IICP and the 1995 DMP used a historical base period calculation, adjusted for growth, made local supply adjustments, and used conservation hardening credits in their formulations. The retail impact adjustment is the only feature of the WSAP that has not been used historically.

Table 5: Historical Shortage Plan Overview

Plan Element	1991 IICP	1995 DMP	WSAP
Historical Base Period	√	√	√
Growth Adjustment	√	√	√
Local Supply Adjustment	√	√	√
Conservation Hardening Credit	√	√	√
Retail Impact Adjustment			√

Appendix G: Water Supply Allocation Formula Example

The following example gives a step-by-step description of how the formula would be used to calculate an allocation of Metropolitan supplies for a hypothetical member agency. All numbers are hypothetical for the purpose of the example and do not reflect any specific member agency.

Step 1: Calculate Base Period Retail Demand

Base Period Local Supplies: Calculated using a two-year average of groundwater (gw), groundwater recovery (gwr), Los Angeles Aqueduct supply (laa), surface water (sw), seawater desalination (sd), and other non-Metropolitan imported supplies (os). For the purpose of this example, assume that the two year average is 59,000 af.

$$[(gw1+gwr1+laa1+sw1+sd1+os1) + (gw2+gwr2+laa2+sw2+sd2+os2)] \div 2 = 59{,}000 \text{ af}$$

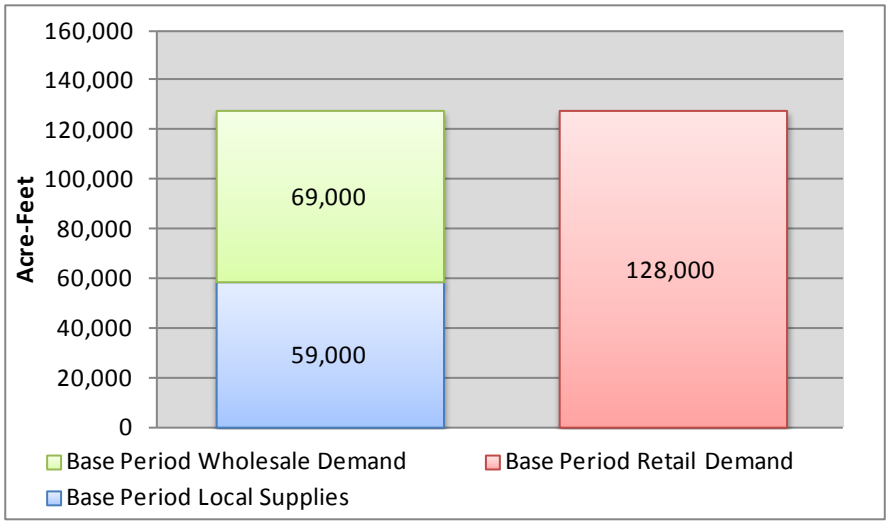
Base Period Wholesale Demands: Calculated using the same two-year time period as the Base Period Local Supplies. The Base Period Wholesale Demands include firm purchases (fp) and in-lieu deliveries to long-term groundwater replenishment (il), conjunctive use (cup), cyclic (cyc), and supplemental storage programs (ss). For the purpose of this example, assume that the two year average is 69,000 af.

$$[(fp^1++il^1+cup^1+cyc^1+ss^1) + (fp^2+il^2+cup^2+cyc^2+ss^2)] \div 2 = 69{,}000 \text{ af}$$

Base Period Retail Demands: Calculated as the sum of the Base Period Local Supplies and Base Period Wholesale Demand.

$$59{,}000 + 69{,}000 = 128{,}000 \text{ af}$$

Figure 1: Base Period Retail Demand Calculation



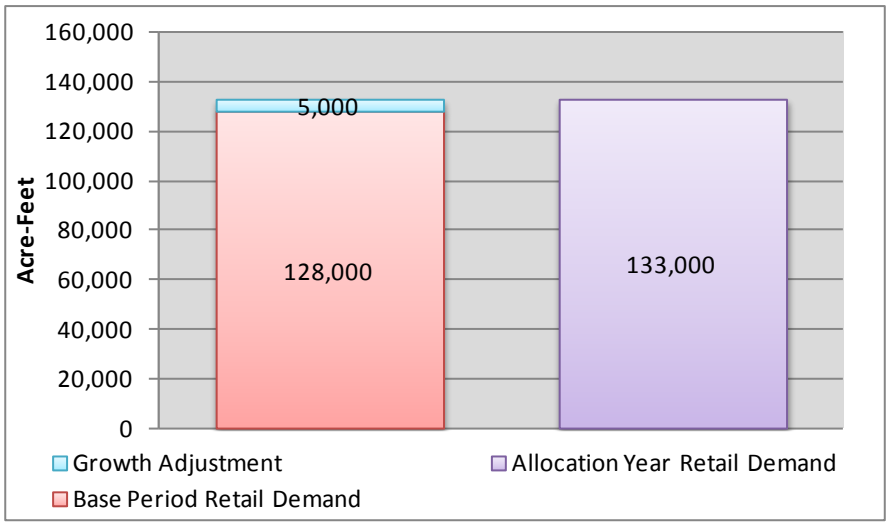
Calculate Adjustment for Base Period Mandatory Rationing (if applicable): The hypothetical agency used in this example is assumed not to qualify for the Base Period Mandatory Rationing Adjustment. A detailed discussion of the adjustment methodology can be found in Appendix I: Base Period Rationing Adjustment Example.

Step 2: Calculate Allocation Year Retail Demand

Allocation Year Retail Demand: Calculated by adjusting the Base Period Retail Demand for any baseline inflation and growth that occurred since the Base Period.

128,000 af + 5,000 af (net adjustment to retail demand) = 133,000 af

Figure 2: Allocation Year Retail Demand Calculation



Step 3: Calculate Allocation Year Wholesale Demand

Allocation Year Local Supplies: Estimates of Allocation Year Local Supplies are provided by the member agencies upon implementation of a WSAP. If estimates are not provided, Metropolitan will use the sum of the Base Period Local Supplies and Base Period In-Lieu Deliveries as a default. Agencies may provide updated estimates at any time during the Allocation Year to more accurately reflect their demand for Metropolitan supplies. For this example assume that the Allocation Year Local Supplies total 65,000 acre-feet.

Allocation Year Local Supplies = 65,000 af

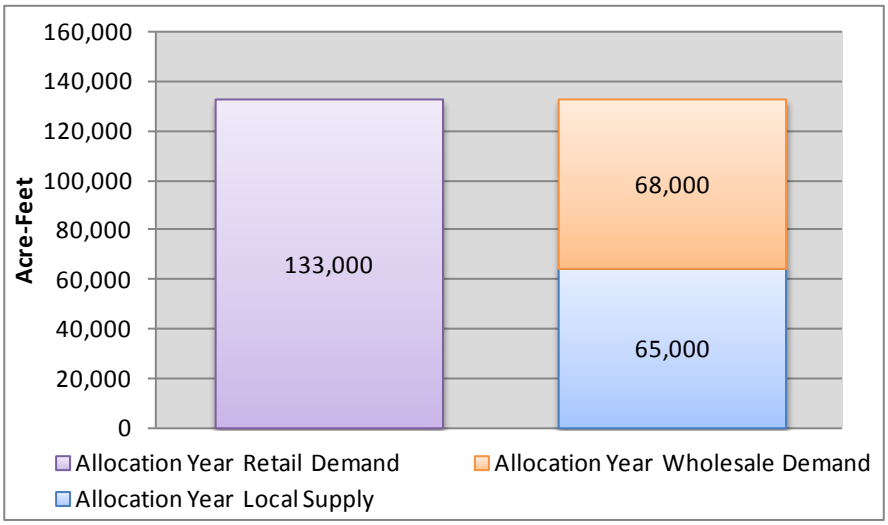
For this example assume also that this agency has an additional 5,000 acre-feet of supplies that meet the determinations for Extraordinary Supply. These supplies are withheld from the allocation formula except for in calculating the Retail Impact Adjustment Allocation.

Extraordinary Local Supplies = 5,000 af

Allocation Year Wholesale Demands: Calculated by subtracting the Allocation Year Local Supplies (65,000 af) from the Allocation Year Retail Demands (133,000 af).

133,000 af - 65,000 af = 68,000 af

Figure 3: Allocation Year Wholesale Demand Calculation



Step 4: Calculate the Wholesale Minimum Allocation

Wholesale Minimum Percentage: Calculate from Table 1 for Regional Shortage Level 4.

Table 1: Shortage Allocation Index		
(a) Regional Shortage Level	(b) Wholesale Minimum Percentage	(c) Maximum Retail Impact Adjustment Percentage
4	70.0%	10.0%

Wholesale Minimum Allocation: Calculated by multiplying the agency's Allocation Year Wholesale Demand (68,000 af) by the Wholesale Minimum Percentage (70%) from the Table 1 for Regional Shortage Level 4.

68,000 af * 70% = 47,600 af

Step 5: Calculate the Retail Impact Adjustment Allocation

Maximum Retail Impact Adjustment Percentage: Calculate from Table 1 for Regional Shortage Level 4.

Retail Impact Adjustment Allocation: Calculated first by determining the agency's dependence on Metropolitan by dividing the Allocation Year Wholesale Demand (68,000 af) minus the Extraordinary Supply (5,000 af) by the Allocation Year Retail Demand (133,000 af) and multiplying by 100.

[(68,000 af - 5,000 af)/ 133,000 af] * 100 = 47%

Next, this percentage dependence on Metropolitan (47%) is multiplied by the Maximum Retail Impact Percentage for Shortage Level 4 (10%).

47% * 10% = 4.7%

This percentage is now multiplied by the Allocation Year Wholesale Demand (68,000 af) for the Retail Impact Adjustment Allocation.

68,000 af * 4.7% = 3,221 af

Step 7: Calculate the Conservation Demand Hardening Adjustment

Calculate Baseline GPCD: To estimate conservation savings, each member agency will establish a historical baseline GPCD calculated in a manner consistent with California Senate Bill SBx7-7, using a 10 or 15-year average ending between 2004 and 2010, using gross water use minus non-potable recycle water production and documented historical population. For this example assume that the Baseline GPCD is 154 GPCD

Baseline GPCD = 154 GPCD

Calculate Allocation Year GPCD: Next, calculate the allocation year GPCD by converting the Allocation Year Retail Demand to GPCD and dividing by the Allocation Year Population from the WSAP. For this example the Allocation Year Retail Demand is 133,000 AF (see Step 2 above) and assume the Allocation Year Population is 905,000 persons. The resulting GPCD is 131 GPCD.

Allocation Year GPCD = 133,000 af/year * 325,851 gallons/af ÷ 365 days/year ÷ 905,000 persons = 131 GPCD

Calculate Reduction in GPCD: Subtract Allocation Year GPCD from Baseline GPCD to determine the GPCD Reduction.

GPCD Reduction = 154 GPCD – 131 GPCD = 23 GPCD

Calculate Conservation Savings: Convert the GPCD Reduction to the equivalent annual conservation savings in acre-feet, using the Allocation Year Population.

$$\text{Conservation Savings} = \frac{(\text{GPCD Reduction}) \times 365 \text{ days/yr} \times \text{Population})}{325{,}851 \text{ gallons/af}}$$

Conservation Savings = 23 x 365 x 905,000 ÷ 325,851 = 23,316 af

Multiply by Regional Shortage Level Percentage: Multiply the Conservation Savings by 10 percent plus an additional 5 percent for each level of Regional Shortage (see Step 4 above). This example assumes a Regional Shortage Level of 4. This scales the hardening credit by the level of regional shortage, thereby increasing the credit as deeper shortages occur when demand hardening has a larger impact on the retail consumer.

23,316 af x (10% + (4 x 5%) = 6,995 af

Multiply by Conservation Savings Percentage: Next, multiply by the percentage of an agency's demand that was reduced through conservation. This scales the hardening by the total percentage reduction to recognize that increased hardening occurs as increasing amounts of conservation are implemented.

Conservation Savings Percentage = 1 + ((Baseline GPCD – Allocation Year GPCD)/Baseline GPCD)

Conservation Savings Percentage = 1+ ((154 GPCD – 131 GPCD)/154 GPCD) = 115%

6,995 af x 115% = 8,044 af

Multiply by Dependence on MWD: Next, multiply by the agency's percentage dependence on MWD as shown in Step 5 above. This scales the credit to the member agency's dependence on MWD to ensure that credits are being applied to the proportion of water demand that is being affected by reductions in MWD's supply. For this example, dependence on MWD is 47%.

8.044 af x 47% = 3,781 af

Summary: The Conservation Demand Hardening Adjustment calculation is summarized by the following formula:

Conservation Demand Hardening Adjustment = Conservation Savings x (10% + Regional Shortage Level %) x (1+Conservation%) x Dependence on MWD %

Conservation Demand Hardening Adjustment = 23,316 af x (10% + (4 x 5%)) x (115%) x (47%) = 3,781 af

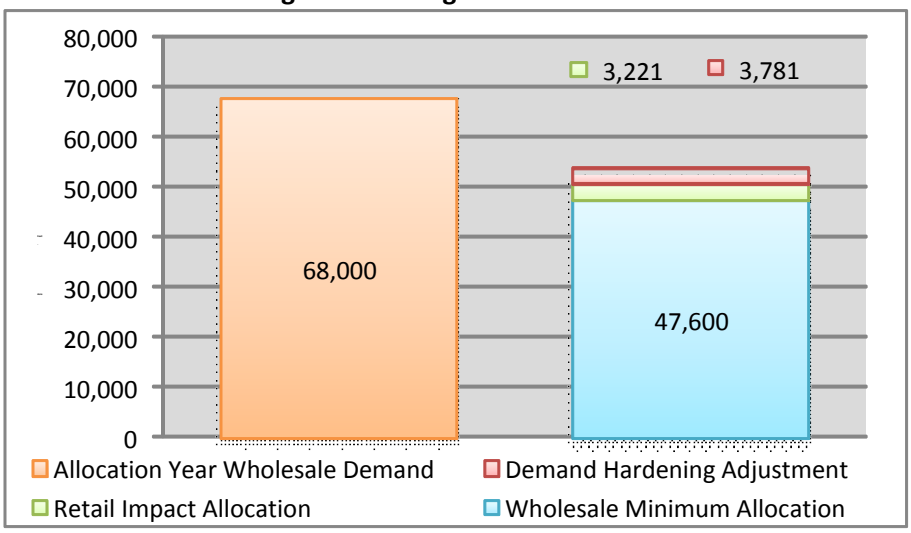
Step 8: Calculate the Low Per-Capita Adjustment Allocation: The hypothetical agency used in this example is assumed not to qualify for the Low Per-Capita Adjustment. A detailed discussion and example of the Low Per-Capita Adjustment calculation can be found in Appendix J: Per Capita Water Use Minimum Example.

Step 9: Calculate the total WSAP Allocation

WSAP Allocation: Calculated by adding the Wholesale Minimum Allocation (47,600 af), the Maximum Retail Impact Adjustment (3,221 af), the Demand Hardening Adjustment (3,781 af), and the Low Per-Capita Adjustment (0 af).

47,600 af + 3,221 af + 3,781 af + 0 af = 54,602 af

Figure 4: WSAP Allocation Regional Shortage Level 4



Step 10: Calculate total retail level reliability

Retail level reliability: Calculated by adding the WSAP Allocation (54,602 af), the Allocation Year Local Supply (65,000 af) and the Extraordinary Local Supply (5,000 af) and dividing by the Allocation Year Retail Demand (133,000 af).

(54,602 af + 65,000 af + 5,000 af) ÷ 133,000 af = 93.7%

Total Metropolitan Supply Allocations: In addition to the WSAP Allocation described above, agencies may also receive separate allocations of supplies for groundwater replenishment and seawater barrier demands. More information on the groundwater replenishment allocation is located in Appendix L: Groundwater Replenishment Allocation.

Appendix H: Board Policy Principles on Determining the Status of Extraordinary Supply

At the June 8, 2010 Water Planning and Stewardship Committee meeting Metropolitan's Board of Directors adopted the following policy principles to guide staff in determining the Extraordinary Supply status of future member agency supply programs.

No Negative Impacts to Other Member Agencies

A potential Extraordinary Supply for a member agency should not decrease the amount of Metropolitan water supply that would be available to the other member agencies in a WSAP. Programs that utilize Metropolitan supplies as a primary or in-lieu source or as a means of payback or future replenishment may have the effect of decreasing supplies, available to other agencies, if designated as Extraordinary Supply.

Provides Supply in Addition to Existing Regional Supplies

A potential Extraordinary Supply should provide a water supply that increases the overall water supplies that are available to the region in a WSAP. A program that is designed to move existing regional supplies from year to year would not qualify.

Specifically Designed Program or Supply Action

A potential Extraordinary Supply must be intentionally created and operated to provide additional supply yield. Normal variations in existing and planned local supply programs would not qualify.

Intended for Consumptive Use in a WSAP

A potential Extraordinary Supply should be designed with the primary intention to deliver water supply to a member agency only at a time when Metropolitan is allocating supplies. Programs designed to deliver water on a regular basis would not qualify. Exceptions for reasonable use of a supply program for emergency or other extenuating local circumstances should be considered.

Fully Documented Resource Management Actions

A potential Extraordinary Supply should have a full description as to the source, transmission, distribution, storage, and delivery of the water supply.

These principles are intended to identify deliberate actions taken by member agencies to augment supplies only when Metropolitan is allocating supplies through the WSAP. Production from existing local supplies, programs that are operated on an ongoing basis, and incidental increases in water supply would not qualify as Extraordinary Supply. The intent of the Extraordinary Supply designation is to recognize programs and actions that are additive to the total regional water supply as the region continues to confront the water supply challenges from drought and regulatory conditions. To that end, any supply actions taken after the initial implementation of the WSAP in July 2009 that utilize Metropolitan supplies either as a primary source, or to refill or replenish an incurred obligation or deficit at a future date would not qualify as Extraordinary Supply.

Appendix I: Base Period Mandatory Rationing Adjustment

Agencies that were under mandatory water use restrictions during the Base Period may have water use that is lower due to the mandatory actions already taken. Without adjusting for this, those agencies could be required to enforce even higher levels of restrictions under an allocation than those agencies that had not started mandatory restrictions.

To qualify for a Base Period Mandatory Rationing Adjustment, the member agency must provide Metropolitan staff with the following information:

- Time period when the mandatory conservation was in effect; it must be in effect during the Base Period
- A statement, with documentation, of how drought restrictions comply with the following Mandatory Conservation qualifications:
    - Governing Body-authorized or enacted
    - Includes mandatory demand reduction actions, restrictions or usage limitations including penalty-backed water budgets
    - Enforced by assessing penalties, fines, or rates based upon violating restrictions or exceeding usage limitations
- If the agency in question is a retail subagency, then the retailer's base period water demands during the Base Period in order to determine proportion to the member agency's total demand
- Historical data to construct GPCD base and trend for the consultation

Calculating the Base Period Rationing Adjustment involves following steps:

- Use the Baseline GPCD 10 or 15-year period selected by member agency for the Conservation Demand Hardening Adjustment calculation.
- Interpolate from the GPCD value of the midpoint of the Baseline GPCD period to the average GPCD of the two years preceding the agency's mandatory conservation
- Extrapolate to the WSAP Base Period (FY2013 and FY2014)
- Calculate the difference between estimated and observed GPCD for FY2013 and FY2014
- Convert to Acre-Feet and add to the member agency's Base Period Retail Demands

Appendix J: Per-Capita Water Use Minimum Example

This adjustment creates a minimum per capita water use threshold. Member agencies' retail-level water use under the WSAP is compared to two different thresholds. The minimum water use levels are based on compliance guidelines for total and residential water use established under Senate Bill X7-7.

Total Retail Level Use: 100 GPCD
Residential Retail Level Use: 55 GPCD

Agencies that fall below either threshold under the WSAP would receive additional allocation from Metropolitan to bring them up to the minimum GPCD water use level. To qualify for this credit, member agencies must provide documentation of the total agency level population and the percent of retail level demands that are residential; no appeal is necessary.

The following example gives a step-by-step description of how the Low Per-Capita Water Use Adjustment would be calculated for a hypothetical member agency. All numbers are hypothetical for the purpose of the example and do not reflect any specific member agency. This example was calculated using the following assumptions:

Allocation Year Retail Demand: 50,000 acre-feet
Allocation Year Local Supplies: 25,000 acre-feet;
Allocation Year Wholesale Demand: 25,000 acre-feet
Base Period Conservation: 5,000 acre-feet
Agency Population: 375,000
Percent of Retail Demands that are Residential: 60%

Step 1: Calculate Total Retail-Level Allocation Year Supplies

Table 6 shows the Allocation Year Local Supply, WSAP Allocation, and the total Allocation Year Supplies for the example agency at each Regional Shortage Level. The WSAP Allocation was calculated using the methodology detailed in Appendix G: Water Supply Allocation Formula Example and the assumptions listed above.

Table 6: Total Retail Level Allocation Year Supplies			
Regional Shortage Level	**Allocation Year Local Supply**	**WSAP Allocation**	**Total Allocation Year Supply**
1	25,000	23,594	48,594
2	25,000	22,188	47,188
3	25,000	20,781	45,781
4	25,000	19,375	44,375
5	25,000	17,969	42,969
6	25,000	16,563	41,563
7	25,000	15,156	40,156
8	25,000	13,750	38,750
9	25,000	12,344	37,344
10	25,000	10,938	35,938

Step 2: Calculate the Equivalent Total and Residential GPCD

The next step is to calculate the equivalent water use in gallons per capita per day (GPCD) for the Total Allocation Year Supply. The following equation shows the GPCD calculation under Regional Shortage Level 10.

35,938 af * 325,851 gallons ÷ 375,000 people ÷ 365 days = 85.6 GPCD

The residential per-capita water use is calculated in the same manner. Based on the assumption that 60% of the agency demands are residential, the following equation shows the residential GPCD calculation under Regional Shortage Level 10.

35,938 af * 60% * 325,851 gallons ÷ 375,000 people ÷ 365 days = 51.3 GPCD

Step 3: Compare the Total and Residential GPCD to the Minimum Water Use Thresholds

The next step is to compare the total GPCD water use to the 100 GPCD total water use threshold. In a Regional Shortage Level 10, the WSAP results in an allocation that is 14.4 GPCD below the minimum threshold.

100 GPCD – 85.6 GPCD = 14.4 GPCD

Likewise the residential GPCD water use is compared to the 55 GPCD residential water use threshold.

55 GPCD – 51.3 GPCD = 3.7 GPCD

Step 4: Determine the Allocation Adjustment in Acre-Feet

The final step is to calculate the acre-foot equivalent of the GPCD that fell below the minimum threshold. In a Regional Shortage Level 10, the adjustment provides 6,068 acre-feet of additional allocation to the agency; the results for Shortage Levels 1-10 are shown in Table 7.

14.4 GPCD ÷ 325,851 gallons * 375,000 people * 365 days = 6,068 acre-feet

Table 7: Total Per-Capita Water Use Adjustment				
Regional Shortage Level	**Allocation Year Supply**	**Equivalent GPCD**	**GPCD Below Threshold**	**Allocation Adjustment**
1	48,594	115.7	0	0
2	47,188	112.3	0	0
3	45,781	109.0	0	0
4	44,375	105.6	0	0
5	42,969	102.3	0	0
6	41,563	98.9	1.1	443
7	40,156	95.6	4.4	1,849
8	38,750	92.3	7.7	3,255
9	37,344	88.9	11.1	4,662
10	35,938	85.6	14.4	6,068

Again, this step is repeated for the residential water use. In a Regional Shortage Level 10, the adjustment provides 1,540 acre-feet of additional allocation to the agency; the residential water use results for Regional Shortage Levels 1-10 are shown in Table 8.

3.7 GPCD ÷ 325,851 gallons * 375,000 people * 365 days = 1,540 acre-feet

Table 8: Residential Per-Capita Water Use Adjustment				
Regional Shortage Level	**Allocation Year Supply**	**Equivalent GPCD**	**GPCD Below Threshold**	**Allocation Adjustment**
1	29,156	69.4	0	0
2	28,313	67.4	0	0
3	27,469	65.4	0	0
4	26,625	63.4	0	0
5	25,781	61.4	0	0
6	24,938	59.4	0	0
7	24,094	57.4	0	0
8	23,250	55.4	0	0
9	22,406	53.3	1.7	697
10	21,563	51.3	3.7	1,540

Agencies that fall below either threshold under the WSAP would receive additional allocation from Metropolitan to bring them up to the minimum GPCD water use level. If an agency qualifies under both thresholds, the one resulting in the maximum allocation adjustment would be given. Under this example the agency would receive 6,068 acre-feet of additional allocation in a Regional Shortage Level 10.

Appendix K: Qualifying Income-Based Rate Allocation Surcharge Adjustment Example

The following example provides a step by step description of how the qualifying income-based rate allocation surcharge adjustment is calculated. To qualify for this adjustment, member agencies must provide documentation showing the amount of retail demands that are covered by a qualifying income-based rate; no appeal is necessary.

The following list summarizes the allocation year demands, local supplies, and allocation as calculated in Appendix G: Water Supply Allocation Formula Example for a hypothetical agency under a Level 4 Regional Shortage. For detailed instructions on how to calculate these figures, reference Appendix G: Water Supply Allocation Formula Example.

Allocation Year Retail Demand: 133,000 acre-feet
Allocation Year Local Supplies: 68,000 acre-feet;
Level 4 WSAP Allocation: 52,735 acre-feet

Step 1: Allocation Surcharge Calculation

(a) Water Use above Allocation: The first step in calculating the income-based rate Allocation Surcharge adjustment is to calculate the agency's total Allocation Surcharge under the WSAP. If the agency did not incur any Allocation Surcharge from the allocation year, the income-based rate allocation surcharge adjustment would not apply. For the purpose of this example, the agency used 61,000 acre-feet of MWD supplies in the allocation year. This represents 8,265 acre-feet of use above the water supply allocation.

WSAP Allocation	52,735 af
Actual MWD Water Use	61,000 af
Use Above WSAP Allocation	8,265 af

(b) Total Allocation Surcharge: In this example the agency used 115.7% of its water supply allocation. 7,910 of the 8,265 acre-feet of use above the allocation would be assessed the Allocation Surcharge at an amount of $1,480 per acre-foot and 354 of the 8,265 acre-feet of use above the allocation would be assessed the Allocation Surcharge at an amount of $2,960.

Between 100% and 115% of Allocation	7,910 af	$1,480/af	$11,706,800
Greater than 115% of Allocation	354 af	$2,960/af	$1,047,840
Total	8,265 af		$12,754,640

Step 2: Effective Income-Based Rate Cutback

(a) Calculate Retail Cutback: The second step in calculating the income-based rate allocation surcharge adjustment is to calculate the amount of supply cutback that would have been expected from qualifying income-based rate customers under the WSAP. Using the water supply allocation that was calculated above, the total retail level impact on the agency can be

determined. In this example the agency receives a retail level cutback of 15,265 acre-feet, or 11.5% of their retail level demand.

WSAP Allocation + Allocation Year Local Supplies	117,735 af
Allocation Year Retail Demand	133,000 af
Effective Cutback	**15,265 af (11.5%)**

(b) Income-based Rate Customer Retail Cutback: To calculate the effective income-based rate cutback, the amount of demand covered by a qualifying income-based rate is multiplied by the effective retail level cutback. For this example assume that the agency has 10,000 acre-feet of qualifying demands.

Qualifying Income-Based Rate Demand	10,000 af
Effective Cutback Percentage	11.5%
Effective Income-Based Rate Cutback	**1,148 af**

(c) Income-based Rate Cutback Allocation Surcharge: Once the effective cutback has been calculated, the amount of Allocation Surcharge that is associated with qualifying income-based rate customers can be determined.

Between 100% and 115% of Allocation	794 af	$1,480/af	$1,175,120
Greater than 115% of Allocation	354 af	$2,960/af	$1,047,840
Total	**1,148 af**		**$2,222,960**

(d) Adjusted Allocation Surcharge Calculation: Finally, the Allocation Surcharge attributable to qualifying income-based rate customers is subtracted from the total Allocation Surcharge that was calculated above to determine the qualifying income-based rate adjusted allocation surcharge. In the case that the monetary amounts associated with the Income-Based Rate are greater than the total amounts an agency incurs, no Allocation Surcharge will be incurred.

Total Allocation Surcharge	$12,754,640
Qualifying Income-Based Rate Allocation Surcharge	$2,222,960
Qualifying Income-Based Rate Adjusted Allocation	**$10,531,680**

Appendix L: Groundwater Replenishment Allocation

Groundwater basins help provide vital local supplies that can buffer the region from short-term drought impacts. Longer droughts can result in reductions to the many sources of water that replenish groundwater basins, resulting in lower basin levels and potential impacts to the overlying consumptive demands. Limited imported deliveries under these conditions may help avoid impacts to the basins that may be drawn out of their normal operating range or subject to water quality or regulatory impacts. To this end, Metropolitan provides a limited allocation for drought impacted groundwater basins based on the following framework:

a) Staff hold a consultation with qualifying member agencies who have taken groundwater replenishment deliveries since 2010 and the appropriate groundwater basin managers to document whether their basins are in one of the following conditions:
    i. Groundwater basin overdraft conditions that will result in water levels being outside normal operating ranges during the WSAP allocation period; or
    ii. Violations of groundwater basin water quality and/or regulatory parameters that would occur without imported deliveries.

b) Provide an allocation based on the verified need for groundwater replenishment. The allocation would start with a member agency's ten-year average purchases of imported groundwater replenishment supplies (excluding years in which deliveries were curtailed). The amount would then be reduced by the declared WSAP Regional Shortage Level (5 percent for each Regional Shortage Level).

c) Any allocation provided under this provision for drought impacted groundwater basins is intended to help support and maintain groundwater production for consumptive use. As such, a member agency receiving an allocation under this provision will be expected to maintain groundwater production levels equivalent to the average pumping in the Base Period. Any adjustments to a member agency's M&I allocation due to lower groundwater production would be reduced by deliveries made under this provision.

d) Agencies for which this allocation does not provide sufficient supplies for the needs of the groundwater basin may use the WSAP Appeals Process to request additional supply (subject to Board approval). The appeal should include a Groundwater Management Plan that documents the need for additional supplies according to the following tenets:
    i. Maintenance of groundwater production levels;
    ii. Maintenance of, or reducing the further decline of, groundwater levels;
    iii. Maintenance of key water quality factors/indicators;
    iv. Avoidance of permanent impacts to groundwater infrastructure or geologic features; and
    v. Consideration of severe and/or inequitable financial impacts.

Final amounts and allocations will be determined following the consultations with groundwater basin managers and member agencies.

Appendix M: Water Rates, Charges, and Definitions

Table 9: Water Rates and Charges Dollars per acre-foot (except where noted)			
Rate	**Effective 1/1/2014**	**Effective 1/1/2015**	**Effective 1/1/2016**
Tier 1 Supply Rate	$148	$158	$156
Tier 2 Supply Rate	$290	$290	$290
System Access Rate	$243	$257	$259
Water Stewardship Rate	$41	$41	$41
System Power Rate	161	$126	$138
Tier 1	$593	$582	$594
Tier 2	$735	$714	$728
Treatment Surcharge	$297	$341	$348
Full Service Treated Volumetric Cost			
Tier 1	$890	$923	$942
Tier 2	$1,032	$1,055	$1,076
Readiness-to-Serve Charge (millions of dollars)	$166	$158	$153
Capacity Charge (dollars per cubic foot second)	$8,600	$11,100	$10,900

Definitions:

(1) **Tier 1 Supply Rate -** recovers the cost of maintaining a reliable amount of supply.
(2) **Tier 2 Supply Rate** - set at Metropolitan's cost of developing additional supply to encourage efficient use of local resources**.**
(3) **System Access Rate** – recovers a portion of the costs associated with the delivery of supplies.
(4) **System Power Rate** – recovers Metropolitan's power costs for pumping supplies to Southern California.
(5) **Water Stewardship Rate** – recovers the cost of Metropolitan's financial commitment to conservation, water recycling, groundwater clean-up and other local resource management programs.
(6) **Treatment Surcharge** – recovers the costs of treating imported water.
(7) **Readiness-to-Serve Charge -** a fixed charge that recovers the cost of the portion of system capacity that is on standby to provide emergency service and operational flexibility.
(8) **Capacity Charge** – the capacity charge recovers the cost of providing peak capacity within the distribution system.

Source: http://www.mwdh2o.com/WhoWeAre/Management/Financial-Information

Appendix N: Allocation Appeals Process

Step 1: Appeals Submittal

All appeals shall be submitted to the Appeals Liaison in the form of a written letter signed by the member agency General Manager. Each appeal must be submitted as a separate request, submittals with more than one appeal will not be considered. The appeal request is to include:

- A designated member agency staff person to serve as point of contact.
- The type of appeal (erroneous baseline data, loss of local supply, etc.).
- The quantity (in acre-feet) of the appeal.
- A justification for the appeal which includes supporting documentation.

A minimum of 60 days are required to coordinate the appeals process with Metropolitan's Board process.

Step 2: Notification of Response and Start of Appeals Process

The Appeals Liaison will phone the designated member agency staff contact within 3 business days of receiving the appeal to provide an initial receipt notification, and schedule an appeals conference. Subsequent to the phone call, the Liaison will send an e-mail to the Agency General Manager and designated staff contact documenting the conversation. An official notification letter confirming both receipt of the appeal submittal, and the date of the appeals conference, will be mailed within 2 business days following the phone contact

Step 3: Appeals Conference

All practical efforts will be made to hold an appeals conference between Metropolitan staff and member agency staff at Metropolitan's Union Station Headquarters within 15 business days of receiving the appeal submittal. The appeals conference will serve as a forum to review the submittal materials and ensure that there is consensus understanding as to the spirit of the appeal. Metropolitan staff will provide an initial determination of the size of the appeal (small or large) and review the corresponding steps and timeline for completing the appeals process.

Steps 4-7 of the appeals process differ depending upon the size of the appeal

Small Appeals

Small appeals are defined as those that would change an agency's allocation by less than 10 percent, or are less than 5,000 acre-feet in quantity. Small appeals are evaluated and approved or denied by Metropolitan staff.

Step 4: Preliminary Decision

Metropolitan staff will provide a preliminary notice of decision to the member agency within 10 business days of the appeals conference. The preliminary decision timeline may be extended to accommodate requests for additional information, data, and documentation. The Appeals Liaison will mail a written letter to the member agency staff contact and General Manager, stating the preliminary decision and the rationale for approving or denying the appeal.

Step 5: Clarification Conference

Following the preliminary decision the Appeals Liaison will schedule a clarification conference. The member agency may choose to decline the clarification conference if they are satisfied with the preliminary decision. Declining the clarification conference serves as acceptance of the preliminary decision, and the decision becomes final upon approval by Metropolitan's executive staff.

Step 6: Final Decision

Metropolitan staff will provide a final notice of decision to the member agency within 10 business days of the clarification conference, pending review by Metropolitan's executive staff. The Appeals Liaison will mail a written letter to the member agency staff contact and General Manager, stating the final decision and the rationale for the decision. A copy of the letter will also be provided to Metropolitan executive staff.

Step 6a: Board Resolution of Small Appeal Claims

Member agencies may request to forward appeals that are denied by Metropolitan staff to the Board of Directors through the Water Planning and Stewardship Committee for final resolution. The request for Board resolution shall be submitted to the Appeals Liaison in the form of a written letter signed by the member agency General Manager. This request will be administered according to Steps 6 and 7 of the large appeals process.

Step 7: Board Notification

Metropolitan staff will provide a report to the Board of Directors, through the Water Planning and Stewardship Committee, on all submitted appeals including the basis for determination of the outcome of the appeal.

Large Appeals

Large appeals are defined as those that would change an agency's allocation by more than 10 percent, and are larger than 5,000 acre-feet. Large appeals are evaluated and approved or denied by the Board of Directors.

Step 4: Preliminary Recommendation

Metropolitan staff will provide a preliminary notice of recommendation to the member agency within 10 business days of the appeals conference. The preliminary decision timeline may be extended to accommodate requests for additional information, data, and documentation. The Appeals Liaison will mail a written letter to the member agency staff contact and General Manager, stating the preliminary recommendation and the rationale for the recommendation. A copy of the draft recommendation will also be provided to Metropolitan executive staff.

Step 5: Clarification Conference

Following the preliminary recommendation the Appeals Liaison will schedule a clarification conference. The member agency may choose to decline the clarification conference if the satisfied with preliminary recommendation. Declining the clarification conference signifies acceptance of the preliminary recommendation, and the recommendation becomes final upon approval by Metropolitan's executive staff.

Step 6: Final recommendation

Metropolitan staff will provide a final notice of recommendation to the member agency within 10 business days of the clarification conference, pending review by Metropolitan executive staff. The Appeals Liaison will mail a written letter to the member agency staff contact and General Manager, stating the final recommendation and the rationale for the recommendation. A copy of the final recommendation will also be provided for Metropolitan executive review.

Step 7: Board Action

Metropolitan staff shall refer the appeal to the Board of Directors through the Water Planning and Stewardship Committee for approval.

Appendix O: Appeals Submittal Checklist

Appeal Submittal

- ☐ Written letter (E-mail or other electronic formats will not be accepted)
- ☐ Signed by the Agency General Manager

Mailed to the appointed Metropolitan Appeals Liaison

Contact Information

- ☐ Designated staff contact
  - o Name
  - o Address
  - o Phone Number
  - o E-mail Address
- ☐ General Manager
  - o Name
  - o Address
  - o Phone Number
  - o E-mail Address

Type of Appeal

- ☐ State the type of appeal
  - o Erroneous historical data used in base period calculations
    - Metropolitan Deliveries
    - Local Production
    - Growth adjustment
    - Conservation savings
  - o Exclusion of physically isolated areas
  - o Extraordinary supply designation
  - o Groundwater Replenishment Allocation
  - o Base Period Mandatory Rationing Adjustment
  - o Other

Quantity of Appeal

- ☐ State the quantity in acre-feet of the appeal

Justification and Supporting Documentation

- ☐ State the rationale for the appeal
- ☐ Provide verifiable documentation to support the stated rationale
  - o Examples of verifiable documentation Include, but are not limited to:
    - Billing Statements
    - Invoices for conservation device installations
    - Basin Groundwater/Watermaster Reports
    - California Department of Finance economic or population data
    - California Department of Public Health reports

ATTACHMENT C

Resolution XXXX

**RESOLUTION
OF THE BOARD OF DIRECTORS
OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
ADOPTING THE WATER SHORTAGE CONTINGENCY PLAN**

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, a water shortage contingency plan; an

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting such Water Shortage Contingency Plans;

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers to conduct an annual water supply and demand assessment (Annual Assessment) each year and to include in their water shortage contingency plans the procedures they use to conduct the Annual Assessment;

WHEREAS, the procedures used to conduct an Annual Assessment include, but are not limited to, the written decision-making process that an urban water supplier will use each year to determine its water supply reliability;

WHEREAS, The Metropolitan Water District of Southern California's (Metropolitan's) water shortage contingency plan provides that by June of each year, Metropolitan staff will present a completed Annual Assessment for approval by Metropolitan's Board of Directors or by the Board's authorized designee with expressly delegated authority for approval of Annual Assessment determinations;

and

WHEREAS, the Board of Directors of The Metropolitan Water District of Southern California has duly reviewed, discussed, and considered such Water Shortage Contingency Plan and has determined the Water Shortage Contingency Plan to be consistent with the Urban Water Management Planning Act and to be an accurate representation of the planned actions during shortage conditions for The Metropolitan Water District of Southern California.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of The Metropolitan Water District of Southern California that, on May XX, 20XX, this District hereby adopts this Water Shortage Contingency Plan for submittal to the State of California and expressly authorizes the General Manager of The Metropolitan Water District of Southern California to approve the Annual Assessment each year.

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of a resolution adopted by the Board of Directors of The Metropolitan Water District of Southern California, at its meeting held on May XX, 20XX.

Executive Secretary
The Metropolitan Water District
of Southern California

Appendix 5

LOCAL SUPPLIES

(Data provided by member agencies as of March 6, 2026 and is subject to revision)

Table A.5-1
Summary of Existing and Planned Local Supply

Metropolitan Service Area	Average Year Ultimate Yield (Acre-Feet)
Groundwater	
Existing	1,194,402
Under Construction	26,370
CEQA Complete	1,200
CEQA In Progress	1,785
Conceptual	89,001
Groundwater Recovery	
Existing	147,166
Under Construction	500
CEQA Complete	0
CEQA In Progress	4,500
Conceptual	21,270
Recycled Water	
Existing	463,611
Under Construction	96,094
CEQA Complete	0
CEQA In Progress	69,860
Conceptual	197,597
Seawater Desalination	
Existing	48,000
Under Construction	0
CEQA Complete	5,600
CEQA In Progress	0
Conceptual	10,200
Surface Water	
Existing	90,261
Under Construction	0
CEQA Complete	300
CEQA In Progress	0
Conceptual	9,050
Other Local Supplies	
Los Angeles Aqueduct	193,381
San Diego Exchanges	293,700
Seepage Credit	4,500

Table A.5-2
Local Supplies by Member Agency

City of Anaheim	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Orange County Basin	Existing	52,860	Unknown
Recycled Water			
Groundwater Replenishment System	Existing	70	2011
City of Beverly Hills	**Status**	**Average Year Ultimate Yield (Acre-Feet)**	**Online Date**
Groundwater Recovery			
Hollywood Basin & La Brea Subarea of Central Basin	Existing	1,200	2003
Hollywood Basin & La Brea Subarea of Central Basin	Under Construction	500	2027
Hollywood Basin & La Brea Subarea of Central Basin	Conceptual	500	2030
City of Burbank	**Status**	**Average Year Ultimate Yield (Acre-Feet)**	**Online Date**
Groundwater Recovery			
San Fernando Groundwater Basin	Existing	12,300	Unknown
Recycled Water			
Burbank Water Reclamation Plant	Existing	3,200	1967
Burbank Water Reclamation Plant	Conceptual	5,340	Unknown
Calleguas Municipal Water District	**Status**	**Average Year Ultimate Yield (Acre-Feet)**	**Online Date**
Groundwater			
Arroyo Santa Rosa Groundwater Basin	Existing	3,359	Unknown
Conejo Groundwater Basin	Existing	5	Unknown
Las Posas Valley Groundwater Basin	Existing	2,548	Unknown
Oxnard Groundwater Subbasin	Existing	18,907	Unknown
Pleasant Valley Groundwater Basin	Existing	5,877	Unknown

Table A.5-2
Local Supplies by Member Agency

Simi Valley Groundwater Basin	Existing	1,500	Unknown
Tierra Rejada Groundwater Basin	Existing	216	Unknown
Arroyo Santa Rosa Groundwater Basin	Conceptual	890	Unknown
Oxnard Groundwater Subbasin	Conceptual	8,400	Unknown
Pleasant Valley Groundwater Basin	Conceptual	1,800	Unknown
Groundwater Recovery			
Pleasant Valley Groundwater Basin	Existing	947	2014
Pleasant Valley Groundwater Basin	Existing	3,800	2023
Simi Valley Groundwater Basin	Existing	1,100	Unknown
Conejo Groundwater Basin	Conceptual	500	2027
Las Posas Valley Groundwater Basin	Conceptual	5,000	2030
Recycled Water			
Camarillo Sanitary District Water Reclamation Plant	Existing	2,325	1955
Camarillo Sanitary District Water Reclamation Plant	Existing	500	2020
Camrosa Water Reclamation Facility	Existing	1,200	Unknown
Hill Canyon Wastewater Treatment Plant	Existing	8,176	2003
Moorpark Water Reclamation Facility	Existing	900	2003
Oxnard Advanced Water Purification Facility	Existing	450	Unknown
Simi Valley Water Quality Control Plant	Existing	80	2001
Tapia Water Reclamation Facility	Existing	1,233	1994
Tapia Water Reclamation Facility	CEQA In Progress	1,500	2030
Camrosa Water Reclamation Facility	Conceptual	3,000	Unknown
Conejo Creek Water	Conceptual	220	Unknown
Moorpark Water Reclamation Facility	Conceptual	1,100	Unknown
Oxnard Advanced Water Purification Facility	Conceptual	6,000	2026
Oxnard Advanced Water Purification Facility	Conceptual	1,345	Unknown

Table A.5-2
Local Supplies by Member Agency

Central Basin Municipal Water District	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Central Basin	Existing	142,769	Unknown
Main San Gabriel Basin	Existing	15,484	Unknown
Groundwater Recovery			
Central Basin	Existing	3,827	2004
Recycled Water			
Long Beach Water Reclamation Plant	Existing	10	1991
Los Coyotes Water Reclamation Plant and San Jose Creek Water Reclamation Plant	Existing	11,244	1978
San Jose Creek Water Reclamation Plant	Existing	54,500	1962
San Jose Creek Water Reclamation Plant	Existing	10,000	2020
City of Compton	**Status**	**Average Year Ultimate Yield (Acre-Feet)**	**Online Date**
Groundwater			
Central Basin	Existing	7,058	Unknown
Eastern Municipal Water District	**Status**	**Average Year Ultimate Yield (Acre-Feet)**	**Online Date**
Groundwater			
Hemet / San Jacinto Basin	Existing	41,000	Unknown
Red Mountain Watershed	Existing	100	Unknown
Temecula Valley Groundwater Basin	Existing	2,200	Unknown
West San Jacinto Basin	Existing	13,000	Unknown
Groundwater Recovery			
West San Jacinto Basin	Existing	3,360	2002
West San Jacinto Basin	Existing	4,500	2006
West San Jacinto Basin	Existing	5,500	2022

Table A.5-2
Local Supplies by Member Agency

West San Jacinto Basin	Conceptual	6,450	Unknown
Recycled Water			
Fallbrook Plant #1 Water Reclamation Plant	Existing	830	1990
San Jacinto Valley, Moreno Valley, Temecula Valley, and Perris Valley Regional Water Reclamation Facilities	Existing	31,705	1966
Santa Rosa Water Reclamation Facility	Existing	4,461	1989
San Jacinto Valley, Moreno Valley, Temecula Valley, and Perris Valley Regional Water Reclamation Facilities	CEQA In Progress	4,000	2030
Fallbrook Plant #1 Water Reclamation Plant	Conceptual	313	Unknown
San Jacinto Valley, Moreno Valley, Temecula Valley, and Perris Valley Regional Water Reclamation Facilities	Conceptual	3,290	2030
San Jacinto Valley, Moreno Valley, Temecula Valley, and Perris Valley Regional Water Reclamation Facilities	Conceptual	1,330	2035
San Jacinto Valley, Moreno Valley, Temecula Valley, and Perris Valley Regional Water Reclamation Facilities	Conceptual	8,500	2040
San Jacinto Valley, Moreno Valley, Temecula Valley, and Perris Valley Regional Water Reclamation Facilities	Conceptual	5,285	Unknown
Santa Rosa Water Reclamation Facility	Conceptual	550	2030
Santa Rosa Water Reclamation Facility	Conceptual	413	Unknown
South Wastewater Treatment Plant	Conceptual	900	Unknown
Seepage Credit			
Hemet / San Jacinto Basin	Existing	4,500	Unknown
Surface Water			
San Jacinto Watershed	Existing	10,260	Unknown
Tucalota Creek	Existing	1,000	Unknown
San Jacinto Watershed	Conceptual	1,500	2035

Table A.5-2
Local Supplies by Member Agency

Foothill Municipal Water District	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Raymond Basin	Existing	2,617	Unknown
Verdugo Groundwater Basin	Existing	2,050	Unknown
Groundwater Recovery			
Verdugo Groundwater Basin	Conceptual	500	Unknown
Recycled Water			
La Cañada Water Reclamation Plant	Existing	75	1962
Crescenta Valley Water District Membrane Bioreactor Plant	Conceptual	300	Unknown
Surface Water			
Canyon Water	Existing	148	Unknown
City of Fullerton	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Orange County Basin	Existing	10,000	Unknown
Orange County Basin	Under Construction	6,500	2026
City of Glendale	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Verdugo Basin	Existing	800	Unknown
Groundwater Recovery			
San Fernando Groundwater Basin	Existing	7,587	1999
Recycled Water			
Los Angeles-Glendale Water Reclamation Plant	Existing	5,600	Unknown

Table A.5-2
Local Supplies by Member Agency

Inland Empire Utilities Agency	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Chino Basin	Existing	55,860	Unknown
Cucamonga Basin	Existing	17,183	Unknown
Lytle Basin	Existing	6,390	Unknown
Rialto Basin	Existing	5,887	Unknown
Six Basins	Existing	5,054	Unknown
Groundwater Recovery			
Chino Basin	Existing	17,733	Unknown
Recycled Water			
Regional Water Recycling Plants RP-1, RP-4, RP-5, Carbon Canyon Water Recycling Facility	Existing	21,350	Unknown
Surface Water			
Cucamonga Canyon Tunnel	Existing	800	Unknown
Day/East Etiwanda Canyon Tunnel	Existing	2,100	Unknown
Deer Canyon	Existing	50	Unknown
Lytle Creek	Existing	4,860	Unknown
San Antonio Creek	Existing	4,416	Unknown
San Antonio Tunnel	Existing	2,178	Unknown
Las Virgenes Municipal Water District	**Status**	**Average Year Ultimate Yield (Acre-Feet)**	**Online Date**
Groundwater			
Simi Valley Groundwater Basin	Existing	15	Unknown
Thousand Oaks Area Groundwater Basin	Existing	310	2000
Woolsey Canyon	Existing	150	Unknown
Recycled Water			
Tapia Water Reclamation Facility	Existing	3,685	Unknown

Table A.5-2
Local Supplies by Member Agency

Tapia Water Reclamation Facility	CEQA In Progress	5,000	2030
City of Long Beach	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Central Basin	Existing	32,692	Unknown
West Coast Basin	Conceptual	6,000	2035
Recycled Water			
Long Beach Water Reclamation Plant	Existing	12,779	1980
City of Los Angeles	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
San Fernando Groundwater Basin	Existing	75,000	Unknown
San Fernando Groundwater Basin	Under Construction	12,000	2026
Central Basin	Conceptual	17,236	Unknown
San Fernando Groundwater Basin	Conceptual	12,800	Unknown
Sylmar Basin	Conceptual	3,570	Unknown
Los Angeles Aqueduct			
Mono Basin, Owens River, and Owens Valley	Existing	193,381	1913
Recycled Water			
Burbank Water Reclamation Plant	Existing	10	2018
Donald C. Tillman Water Reclamation Plant	Existing	2,800	2007
Edward C. Little Water Recycling Facility	Existing	858	1996
Los Angeles-Glendale Water Reclamation Plant	Existing	2,500	1979
Terminal Island Water Reclamation Plant	Existing	8,500	2002
Donald C. Tillman Water Reclamation Plant	Under Construction	40,000	2028
Edward C. Little Water Recycling Facility	Under Construction	22	2028
Los Angeles-Glendale Water Reclamation Plant	Under Construction	450	2041
Terminal Island Water Reclamation Plant	Under Construction	1,000	2025
Burbank Water Reclamation Plant	Conceptual	194	Unknown

Table A.5-2
Local Supplies by Member Agency

Edward C. Little Water Recycling Facility	Conceptual	1,473	Unknown
Los Angeles-Glendale Water Reclamation Plant	Conceptual	585	Unknown
Terminal Island Water Reclamation Plant	Conceptual	11,176	Unknown
Municipal Water District of Orange County	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
La Habra Basin	Existing	2,515	Unknown
Main San Gabriel Basin	Existing	15,300	Unknown
Orange County Basin	Existing	203,729	Unknown
San Juan Basin	Existing	500	Unknown
San Mateo Basin	Existing	500	Unknown
Unknown Source	Existing	2,000	Unknown
Orange County Basin	Conceptual	13,211	Unknown
San Juan Basin	Conceptual	5,000	2030
Groundwater Recovery			
Orange County Basin	Existing	2,000	1989
Orange County Basin	Existing	3,200	1996
Orange County Basin	Existing	8,000	2002
Orange County Basin	Existing	5,600	2007
Orange County Basin	Existing	6,400	2012
Orange County Basin	Existing	8,941	2013
San Juan Basin	Existing	1,000	2007
San Juan Basin	Existing	4,800	2004
San Juan Basin	Conceptual	800	2026
San Juan Basin	Conceptual	3,000	2030
Recycled Water			
Aliso Creek Water Reclamation Facility	Existing	0	2014
Chiquita & Oso Creek Water Reclamation Plants	Existing	6,477	1978
Coastal Advanced Wastewater Treatment Plant	Existing	850	1984

Table A.5-2
Local Supplies by Member Agency

El Toro Water Recycling Plant	Existing	1,485	1998
Green Acres Project	Existing	3,042	1992
Groundwater Replenishment System	Existing	130,000	2008
Los Coyotes Water Reclamation Plant	Existing	250	Unknown
Michelson and Los Alisos Water Recycling Plants	Existing	30,461	1967
Regional & 3A Advanced Wastewater Treatment Plants	Existing	5,013	1984
Robinson Ranch Water Reclamation Plant	Existing	701	1987
San Clemente Water Reclamation Plant	Existing	1,155	1957
Chiquita & Oso Creek Water Reclamation Plants	Conceptual	3,700	2025
Chiquita & Oso Creek Water Reclamation Plants	Conceptual	2,500	2030
Chiquita & Oso Creek Water Reclamation Plants	Conceptual	4,277	2035
Chiquita & Oso Creek Water Reclamation Plants	Conceptual	55	2040
Coastal Advanced Wastewater Treatment Plant	Conceptual	250	2025
Coastal Advanced Wastewater Treatment Plant	Conceptual	150	2030
Coastal Advanced Wastewater Treatment Plant	Conceptual	100	2035
El Toro Water Recycling Plant	Conceptual	300	2030
El Toro Water Recycling Plant	Conceptual	70	Unknown
Michelson and Los Alisos Water Recycling Plants	Conceptual	7,509	2025
Regional & 3A Advanced Wastewater Treatment Plants	Conceptual	1,466	2030
San Clemente Water Reclamation Plant	Conceptual	250	2026
San Clemente Water Reclamation Plant	Conceptual	2,000	2030
Seawater Desalination			
Doheny Desalination Plant	CEQA Complete	5,600	2030
Doheny Desalination Plant	Conceptual	10,200	Unknown
Surface Water			
Upper Santiago Creek Watershed	Existing	5,790	1931

Table A.5-2
Local Supplies by Member Agency

City of Pasadena	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Raymond Basin	Existing	9,233	Unknown
Raymond Basin	Under Construction	1,500	2026
Raymond Basin	CEQA Complete	1,200	2025
Recycled Water			
Los Angeles-Glendale Water Reclamation Plant	Conceptual	6,000	Unknown
Surface Water			
Arroyo Seco and Millard Canyon Streams	Conceptual	200	Unknown
Arroyo Seco and Millard Canyon Streams	Existing	1,200	Unknown
Eaton Wash	Existing	700	Unknown
Arroyo Seco and Millard Canyon Streams	CEQA Complete	300	2029
Arroyo Seco and Millard Canyon Streams	Conceptual	550	2030
San Diego County Water Authority	**Status**	**Average Year Ultimate Yield (Acre-Feet)**	**Online Date**
Exchanges			
All-American and Coachella Canal Lining	Existing	77,700	2003
Imperial Irrigation District Conserved Water	Existing	200,000	2003
San Luis Rey Supplemental Water	Existing	16,000	2003
Groundwater			
Las Flores River Basin	Existing	2,375	Unknown
Lower Santa Margarita River Basin	Existing	2,375	Unknown
Pauma Basin	Existing	7,500	Unknown
San Diego Formation	Existing	1,900	Unknown
San Diego River Valley Basin (Santee-El Monte Basin)	Existing	1,100	Unknown
San Mateo Basin	Existing	2,375	Unknown
San Onofre Basin	Existing	2,375	Unknown

Table A.5-2
Local Supplies by Member Agency

Groundwater Recovery			
Mission Basin	Existing	2,800	1992
San Diego Formation	Existing	5,600	2000
Lower Sweetwater River Basin	CEQA In Progress	500	2035
Middle Sweetwater River Basin	Conceptual	1,000	2035
San Diego Formation	Conceptual	400	2035
San Dieguito Basin	Conceptual	1,120	2025
San Marcos Basin	Conceptual	2,000	2030
Recycled Water			
4S Ranch Water Reclamation Facility	Existing	1,050	2003
Carlsbad Water Recycling Facility	Existing	2,318	1993
Hale Avenue Resource Recovery Facility	Existing	6,200	2004
Harmony Grove Water Reclamation Plant	Existing	200	Unknown
Meadowlark Water Reclamation Facility	Existing	2,560	1993
North City Water Reclamation Plant	Existing	12,057	1998
North Wastewater Treatment Plant	Existing	485	Unknown
R. W. Chapman Water Reclamation Facility	Existing	1,100	1991
Ray Stoyer Water Reclamation Plant	Existing	1,120	1959
Ray Stoyer Water Reclamation Plant	Existing	1,232	1998
San Elijo Water Reclamation Facility	Existing	1,831	2000
San Luis Rey Wastewater Treatment Plant	Existing	719	1992
Recycled Water			
San Vicente Water Reclamation Plant	Existing	350	1996
Santa Fe Valley Water Reclamation Facility	Existing	180	2003
Santa Maria Water Reclamation Plant	Existing	170	1999
South Bay Water Reclamation Plant	Existing	6,955	2006
South Wastewater Treatment Plant	Existing	2,300	Unknown
Woods Valley Ranch Water Reclamation Facility	Existing	231	2005
East County Advanced Water Purification Facility	Under Construction	14,002	2028
North City Water Reclamation Plant	Under Construction	16,800	2028
North City Water Reclamation Plant	Under Construction	16,800	2030

Table A.5-2
Local Supplies by Member Agency

San Luis Rey Wastewater Treatment Plant	Under Construction	3,360	2028
San Luis Rey Wastewater Treatment Plant	Under Construction	3,360	2030
Central Area Water Reclamation Plant	CEQA In Progress	59,360	2035
4S Ranch Water Reclamation Facility	Conceptual	100	2030
East County Advanced Water Purification Facility	Conceptual	2,800	2045
Encina Water Pollution Control Facility Advanced Purification Facility	Conceptual	9,250	2035
Hale Avenue Resource Recovery Facility	Conceptual	3,400	2025
Hale Avenue Resource Recovery Facility	Conceptual	7,400	2035
Hale Avenue Resource Recovery Facility	Conceptual	1,000	2040
Lilac Hills Ranch Water Reclamation Facility	Conceptual	294	2035
Lower Moosa Canyon Water Reclamation Facility	Conceptual	700	2025
Meadowlark Water Reclamation Facility	Conceptual	471	2025
Meadowlark Water Reclamation Facility	Conceptual	2,200	2030
Meadowlark Water Reclamation Facility	Conceptual	300	2040
Meadowood Water Reclamation Facility	Conceptual	143	2025
North City Water Reclamation Plant	Conceptual	300	2030
North Village Water Reclamation Facility	Conceptual	105	2035
R. W. Chapman Water Reclamation Facility	Conceptual	4,400	2035
San Elijo Water Reclamation Facility	Conceptual	44	2025
San Elijo Water Reclamation Facility	Conceptual	1,520	2030
San Elijo Water Reclamation Facility	Conceptual	9,250	2035
San Luis Rey Wastewater Treatment Plant	Conceptual	2,786	2025
San Luis Rey Wastewater Treatment Plant	Conceptual	2,040	2030
Welk Water Reclamation Facility	Conceptual	140	2025
Woods Valley Ranch Water Reclamation Facility	Conceptual	532	2030
Seawater Desalination			
Claude "Bud" Lewis Carlsbad Desalination Plant	Existing	48,000	2015
Surface Water			
Otay River Watershed	Existing	5,504	Unknown
San Diego River Watershed	Existing	7,446	Unknown

Table A.5-2
Local Supplies by Member Agency

San Dieguito River Watershed	Existing	11,206	Unknown
San Luis Rey River Watershed	Existing	10,000	Unknown
Sweetwater River Watershed	Existing	5,000	Unknown
Tijuana River Watershed	Existing	5,504	Unknown
City of San Fernando	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Sylmar Basin	Existing	3,570	Unknown
City of San Marino	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Main San Gabriel Basin	Existing	5,769	Unknown
Raymond Basin	Existing	1,223	Unknown
City of Santa Ana	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Orange County Basin	Existing	28,500	Unknown
Recycled Water			
Green Acres Project	Existing	250	2008
City of Santa Monica	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Santa Monica Basin	Existing	8,100	Unknown
Recycled Water			
Santa Monica Urban Runoff Recycling Facility	Existing	560	2005
Sustainable Water Infrastructure Initiative Advanced Water Treatment Facility	Existing	1,120	2023

Table A.5-2
Local Supplies by Member Agency

Sustainable Water Infrastructure Initiative Advanced Water Treatment Facility	Under Construction	300	2026
Three Valleys Municipal Water District	**Status**	**Average Year Ultimate Yield (Acre-Feet)**	**Online Date**
Groundwater			
Central Basin	Existing	2,000	Unknown
Chino Basin	Existing	15,218	Unknown
Main San Gabriel Basin	Existing	5,000	2016
Main San Gabriel Basin	Existing	18,795	Unknown
Puente Basin	Existing	1,841	Unknown
Six Basins	Existing	13,843	Unknown
Spadra Basin	Existing	255	Unknown
Main San Gabriel Basin	Conceptual	7,200	Unknown
Six Basins	Conceptual	1,500	2025
Six Basins	Conceptual	3,500	Unknown
Spadra Basin	Conceptual	2,994	Unknown
Groundwater Recovery			
Six Basins	Existing	981	2008
Recycled Water			
Pomona Water Reclamation Plant	Existing	2,350	1973
Recycled Water			
Pomona Water Reclamation Plant	Existing	2,268	1986
San Jose Creek Water Reclamation Plant	Existing	960	1985
Surface Water			
San Antonio Creek	Existing	2,000	Unknown

Table A.5-2
Local Supplies by Member Agency

City of Torrance	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
West Coast Basin	Existing	5,000	Unknown
West Coast Basin	Under Construction	3,000	2030
Groundwater Recovery			
West Coast Basin	Existing	1000	2001
West Coast Basin	CEQA In Progress	4000	2028
Recycled Water			
Edward C. Little Water Recycling Facility	Existing	5,000	1995
Upper San Gabriel Valley Municipal Water District	**Status**	**Average Year Ultimate Yield (Acre-Feet)**	**Online Date**
Groundwater			
Main San Gabriel Basin	Existing	127,672	Unknown
Raymond Basin	Existing	5,605	Unknown
Recycled Water			
San Jose Creek Water Reclamation Plant	Existing	8	2025
San Jose Creek Water Reclamation Plant	Existing	692	1978
Whittier Narrows Water Reclamation Plant	Existing	1,175	2006
San Jose Creek Water Reclamation Plant	Conceptual	256	2025
Whittier Narrows Water Reclamation Plant	Conceptual	140	2030
Whittier Narrows Water Reclamation Plant	Conceptual	75	2035
Whittier Narrows Water Reclamation Plant	Conceptual	120	2040
Whittier Narrows Water Reclamation Plant	Conceptual	240	2045
Surface Water			
San Gabriel River	Existing	10,100	Unknown

Table A.5-2
Local Supplies by Member Agency

West Basin Municipal Water District	Status	Average Year Ultimate Yield (Acre-Feet)	Online Date
Groundwater			
Central Basin	Existing	3,000	Unknown
West Coast Basin	Existing	29,000	Unknown
Recycled Water			
Edward C. Little Water Recycling Facility	Existing	24,000	Unknown
Edward C. Little Water Recycling Facility	Conceptual	10,400	2030
Edward C. Little Water Recycling Facility	Conceptual	10,000	2035
Recycled Water			
Edward C. Little Water Recycling Facility	Conceptual	5,600	2040
Edward C. Little Water Recycling Facility	Conceptual	26,300	Unknown
Western Municipal Water District of Riverside County	**Status**	**Average Year Ultimate Yield (Acre-Feet)**	**Online Date**
Groundwater			
Bedford-Coldwater Subbasin	Existing	6,391	Unknown
Bunker Hill Basin	Existing	55,263	Unknown
Chino Basin	Existing	18,000	Unknown
Elsinore Valley Subbasin	Existing	5,500	Unknown
Rialto-Colton Basin	Existing	2,728	Unknown
Riverside-Arlington Basin	Existing	28,282	Unknown
San Bernardino Basin Area	Existing	227	Unknown
Temecula Valley Groundwater Basin	Existing	11,452	Unknown
Temescal Basin	Existing	17,500	Unknown
Elsinore Valley Subbasin	Under Construction	970	2025
Riverside-Arlington Basin	Under Construction	2,400	2025
Elsinore Valley Subbasin	CEQA In Progress	485	2029
Riverside-Arlington Basin	CEQA In Progress	1,300	2026

Table A.5-2
Local Supplies by Member Agency

Bunker Hill Basin	Conceptual	2,500	2035
Riverside-Arlington Basin	Conceptual	2,400	2026
Groundwater Recovery			
Chino Basin	Existing	16,267	2000
Riverside-Arlington Basin	Existing	9,000	1990
Temescal Basin	Existing	9,723	2001
Recycled Water			
Horsethief Canyon Water Recycling Facility	Existing	400	1985
Railroad Canyon Water Recycling Facility	Existing	1,000	1984
Regional Water Recycling Facility	Existing	6,704	Unknown
Riverside Regional Water Quality Control Plant	Existing	141	Unknown
Temecula Valley Regional Water Reclamation Facility	Existing	300	2014
Temescal Valley Water Reclamation Facility	Existing	155	Unknown
Wastewater Treatment Plants 1, 2, and 3	Existing	4,795	Unknown
Western Water Recycling Facility	Existing	2,200	1940
Riverside Regional Water Quality Control Plant	Conceptual	500	2030
Riverside Regional Water Quality Control Plant	Conceptual	9,750	2035
Unknown Source	Conceptual	2,200	2030
Western Riverside County Regional Wastewater Authority	Conceptual	2,900	2026
Surface Water			
Box Springs Stream Recharge	Conceptual	2,800	2035
San Jacinto Watershed	Conceptual	2,500	2028
Stormwater Recharge	Conceptual	1,500	2040

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Appendix 6

WATER CONSERVATION SAVINGS ESTIMATES

Appendix 6
WATER CONSERVATION SAVINGS ESTIMATES

Background

Unlike traditional water supplies, which can be directly measured, conservation reduces water demand in ways that may only be quantified indirectly. Demand is reduced through changes in consumer behavior and savings from water-efficient fixtures. Conservation savings can be quantified into three major components:

- Active Conservation – Water savings that are driven by water agencies providing financial incentives (rebates) for consumers to swap out water fixtures for more efficient ones, such as Metropolitan's Conservation Credits Program (CCP). Active conservation is unlikely to occur without agency action.
- Code-Based Conservation – Water savings resulting from changes in plumbing codes and water efficiency measures. Code-based conservation occurs as a matter of course without financial incentives from water agencies.
- Price-Effect Conservation – Reductions in customer water use attributed to changes in the cost of water – customers use less water as water becomes more expensive.

Conservation savings are estimated from a base-year water use profile. 1980 serves as the base year for estimating conservation savings because it marked the effective change of the plumbing code in California, requiring toilets in new construction to be rated at 3.5 gallons per flush or less (from 5 to 7 GPF). Within Metropolitan's planning framework, the pre-1990 savings refer to a period between 1980 and 1990, where, in Metropolitan's service area, it is estimated to have saved approximately 250,000 acre-feet per year as a result of the 1980 plumbing code and water rate increases. Metropolitan's conservation accounting combines pre-1990 savings and estimates of achieved savings from active, code-based, and price-effect conservation.

Metropolitan's Conservation Estimate

Conservation savings are quantified using the Conservation Savings Model (Conservation Model) developed by Metropolitan. The Conservation Model calculates savings from active, code-based, and price-effect conservation. Potential savings from public outreach and education programs are not included in Metropolitan's conservation estimate.

Active Conservation

The CCP is comprised of 105 devices and programs, which are accounted for in calculating active conservation savings. The devices and programs were administered by Metropolitan and its member agencies since 1990. The savings are calculated by combining the number of devices and/or programs implemented with the corresponding savings factors for the lifetime of the device and/or program. These devices are spread across residential, landscape, commercial, industrial, and institutional sectors. Of these, there are six fixtures tied to a code-based conservation estimate. The Conservation Model calculates savings for

single-family residential, multi-family residential, and commercial, industrial, and institutional.

Code-Based Conservation

Code-based conservation accounts for water saved as a result of changes in water efficiency requirements for plumbing fixtures in the California Plumbing Code and the federal Energy Policy Act of 1992 (plumbing code). Code-based conservation is driven by the number of indoor water fixtures being replaced with more efficient ones (e.g., ultra-low flush toilets). The calculation considers the water usage of conserving versus non-conserving water devices and aggregates the differences, which are water savings. The calculation also considers the plumbing code compliance rate and device saturation (see Table A.6-2).

The Conservation Model considers both new and existing housing units. Water fixtures installed in newly constructed houses are assumed to be in compliance with the plumbing code. For instance, a house built in 1997 would meet the efficiency standards set by California's 1992 plumbing code. Therefore, new homes are assumed to have measurable savings due to the plumbing codes. For existing housing units, the Conservation Model assumes a natural replacement rate. Natural replacement occurs when fixtures are replaced with water-efficient fixtures due to remodeling, failure, or other reasons. The savings calculation includes the natural replacement rate, which is expressed as a percentage of existing fixtures that are replaced in a given year. Natural replacement rates vary by water fixtures and are linked to the expected useful life. Fixtures with short lifespans will be replaced more frequently and thus have higher natural replacement rates. Table A.6-1 below shows the water-efficient fixtures in the plumbing code.

Table A.6-1
Fixtures in Plumbing Code

Residential	CII
Toilets	Toilets
Showerheads	Urinals
Faucet Aerators	Pre-Rinse Spray Heads

Savings from plumbing code is determined by the device-specific assumptions for the fixtures presented in Table A.6-2.

Table A.6-2
Plumbing Code Assumptions

Stock Model	Plumbing Code Year	Device per Household/ Employee	Compliance Rate	Natural Replacement Rate	Device Life Years
Res. Toilets	1994/2014	2	99%	2%	20
Res. Shower Heads	1994	1.8	95%	10%	5
Res. Aerators	1994	3.5	90%	33%	2
CII Toilets	1994/2014	0.27*	100%	2%	20
CII Urinals	1994	0.06	100%	4%	20
CII Pre-Rinse Spray Heads	2006	0.0055*	95%	16.70%	5

* Varies over time and by agency (based on CUWCC BMPs savings factors).

- Devices per Household or Per Employee: This factor represents the average number of devices per household or per employee and is multiplied by the corresponding household or employment projections to develop estimates of the total number of devices. Devices per household and employee can vary by agency and change over time.
- Plumbing Code Compliance Rate: A plumbing code compliance rate measures the percentage of water-efficient fixtures installed that fully adhere to applicable laws, regulations, and industry standards.
- Natural Replacement Rate: This represents the rate at which existing non-conserving devices are converted to conserving devices due to remodeling or device failure.
- Device Life: This represents the useful life span of a device working effectively and efficiently as designed.

Price-Effect Savings Assumptions

Price-effect savings represent behavioral conservation where customers use less water when the price of water increases, typically due to tiered rates, drought surcharges, or rate restructuring. Metropolitan uses the price elasticity of the demand forecasting model, MWD-EDM, to measure the percentage change in water use for each one percent change in price. The difference is the price-effect savings measured from a 1990 base.

The total conservation savings are shown in Table A.6-3 below.

Table A.6-3 Conservation Savings (acre-feet)

	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040	2045	2050
Active Savings	0	26,000	59,000	94,000	133,000	152,000	144,000	112,000	71,000	42,000	31,000	21,000	5,000
Code-Based Savings	0	83,000	175,000	242,000	301,000	380,000	467,000	545,000	607,000	644,000	673,000	695,000	711,000
Price Savings	0	31,000	62,000	94,000	125,000	156,000	187,000	210,000	244,000	286,000	335,000	392,000	454,000
Pre-1990 Savings	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000
Total	**250,000**	**390,000**	**546,000**	**680,000**	**809,000**	**938,000**	**1,048,000**	**1,117,000**	**1,172,000**	**1,222,000**	**1,289,000**	**1,358,000**	**1,420,000**

Note: Metropolitan's conservation savings projection includes savings from Metropolitan's Conservation Credits Program, code-based conservation, price-effect conservation, and pre-1990 device retrofits. The projection does not include savings from the implementation of future active conservation programs.

Appendix 7

METROPOLITAN'S EMERGENCY STORAGE OBJECTIVE

Appendix 7
METROPOLITAN'S EMERGENCY STORAGE OBJECTIVE

Metropolitan established its original criteria for determining emergency storage requirements in the October 1991 Final Environmental Impact Report for the Eastside Reservoir, which is now named Diamond Valley Lake. Emergency storage requirements are based on the potential of a major earthquake that would damage all supply aqueducts isolating Southern California from its imported water sources. The emergency storage criteria developed within the Eastside Reservoir EIR were again discussed in the 1996 Integrated Water Resources Plan. Metropolitan's Board approved both of these documents.

In 2019, Metropolitan and its member agencies completed a process to update the emergency criteria and methodology for determining the regional planning estimate of emergency storage under Metropolitan's Emergency Storage Objective. This planning estimate of emergency storage represents the amount of water that Metropolitan would store for the region to prepare for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California, including the Colorado River Aqueduct, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct. These emergency supplies, stored in Metropolitan and DWR's existing surface reservoirs within the region, will allow Metropolitan to deliver reserve supplies to the member agencies to supplement their local production during a catastrophic earthquake or other disaster. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service.

The Emergency Storage Objective considers a six- and twelve-month outage period for the imported supply aqueducts, based on latest seismic information and estimates of repair duration for the different aqueducts. It also accounts for the operational flexibility of Metropolitan's distribution system, a retail water demand cutback ranging from 25 to 35 percent considering the level of conservation that the region achieved during the recent drought, and an aggregated loss of 10 to 20 percent of local supplies accounting for factors that could affect local production during emergency conditions.

Under this update, Metropolitan's Emergency Storage Objective was set to 750,000 acre-feet, as this level of storage would prevent severe water shortages to the region given new information on expected recovery durations. While the emergency storage would allow Metropolitan to deliver reserve supplies to the member agencies to meet their water needs during a catastrophic event, it is not intended to set a basis or a policy for allocating or apportioning storage for any individual member agency.

Included in this appendix is a copy of the Board Information Letter to Metropolitan's Water Planning and Stewardship Committee dated May 14, 2019. This Board Information Letter and the attached draft white paper review the history, policy, and criteria for evaluating a regional planning estimate for emergency storage and describe the more than year-long coordination process between Metropolitan and its member agencies in developing the region's estimate for Emergency Storage Objective.

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

INFORMATION

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

5/14/2019 Board Meeting

9-3

Subject

Update of Metropolitan's Emergency Storage Objective

Executive Summary

In February 2018, The Metropolitan Water District of Southern California (Metropolitan) and its member agencies embarked on a process to evaluate regional storage including how the storage programs performed during this post decade of drought and revisiting the size and management of Metropolitan's emergency storage reserve. This process aims to maximize the potential for optimizing performance and operations of Metropolitan's storage programs. As part of the process, a Workgroup comprised of Metropolitan staff and representatives from member agencies evaluated Metropolitan's emergency storage objective.

Metropolitan, in coordination with the Workgroup, completed the attached draft White Paper on emergency storage, which summarizes the progress to date in estimating a planning objective for the region's emergency storage.

Details

The White Paper reviews the history, policy, and criteria for evaluating a regional planning estimate for emergency storage. This evaluation prepares for major earthquake or other damage to the aqueducts that import water to Southern California. The emergency storage would allow Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This would help avoid severe water shortages while one or more of the imported water aqueducts may be out of service.

The White Paper also describes the mechanisms the Workgroup employed, including: (1) updated emergency criteria, and (2) a revised methodology to evaluate emergency storage.

Updating emergency criteria involved revising the outage durations based on the latest seismic information, and revisiting retail water demands and locally available supplies within the service area. It also accounted for the member agencies' unique situations in identifying practicable ranges of reduction of retail water demands through conservation and production levels of local water supplies during an imported supply emergency outage.

The proposed emergency storage volume considers various combinations of criteria to determine an envelope of acceptable scenarios designed to prevent severe shortages during the outage. Under this approach, the Workgroup focused on a range of values from 520,000 to 830,000 acre-feet (AF). With input from the Workgroup, staff recommends increasing the emergency storage objective to 750,000 AF. This recommended volume would be distributed amongst the available capacities of in-region Department of Water Resources and Metropolitan surface reservoirs.

The recommended emergency storage volume of 750,000 AF is an increase from the current planning target of 630,000 AF. A longer outage period based on damage restoration analysis and a consideration of lower local supply production attributed to this recommended increase in emergency storage.

The emergency storage volume presented in the White Paper represents a planning estimate for the amount of water that Metropolitan would store for the region in preparation for a catastrophic earthquake or other disaster. It

is not intended to set a basis or a policy for allocating or apportioning storage for any individual member agency. Staff will review and incorporate additional Board and Workgroup feedback in finalizing the White Paper. Staff will transmit the final White Paper to the Board and the member agencies.

Staff proposes to revisit the emergency storage periodically, and incorporate the analysis into the Integrated Water Resources Plan update process. In addition, a detailed review of the spatial distribution of storage and operation of the distribution system will be part of Metropolitan's continued efforts to evaluate the storage portfolio. This next phase of evaluating Metropolitan's regional storage portfolio is expected to be completed by spring of 2020.

Policy

By Minute Item 50358, dated January 12, 2016, the Board adopted the 2015 Integrated Water Resources Plan Update, as set forth in Agenda Item 8-3 board letter.

By Minute Item 50473, dated May 10, 2016, the Board adopted the 2015 Urban Water Management Plan, as set forth in Agenda Item 8-6 board letter.

Fiscal Impact

None

Bradley M. Coffey 5/1/2019
Brad Coffey *Date*
Manager, Water Resource Management

5/1/2019
Jeffrey Kightlinger *Date*
General Manager

Attachment 1 – Draft White Paper on Metropolitan's Emergency Storage Objective (May 2019)

Ref# wrm12661707

2018 Evaluation of Regional Storage Portfolio
DRAFT Evaluation of Metropolitan's Emergency Storage Objective

SUMMARY

In February 2018, the Metropolitan Water District of Southern California (Metropolitan) and its member agencies embarked on a process for the Evaluation of Regional Storage Portfolio (ERSP) to maximize potential for performance and operations of Metropolitan's storage programs. As part of the ERSP process, a Workgroup comprised of Metropolitan staff and representatives from member agencies evaluated Metropolitan's Emergency Storage Objective (Emergency Storage).

This White Paper provides a summary of the history, policy, and criteria for evaluating a regional planning estimate for the Emergency Storage. This evaluation assumes major earthquake damage to the aqueducts that transport imported water supplies to Southern California. The Emergency Storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service.

This White Paper describes: (1) updating the emergency criteria, and (2) revising the methodology for calculating the Emergency Storage.

In the review and update of emergency criteria, the Workgroup considered the 2015 Integrated Water Resources Plan (IRP) and centered on the following:

- A retail water demand cutback of 25 to 35 percent appears reasonable, based on the level of conservation that the region achieved during the recent drought; and
- A six-and 12-month aggregated loss of 10 to 20 percent of local production reported in the IRP seems reasonable. This allows a contingency for some damage to local facilities and accommodates variable durations of local repairs.

The Workgroup discussion also led to a new concept of an "envelope of solutions" to estimate an appropriate Emergency Storage for the region. The envelope concept shifts from a single equation and volume for determining emergency storage. Instead, it considers various combinations of criteria to determine a range of acceptable scenarios for Emergency Storage. The prior methodology assumed a single region-wide scenario of conservation and local production loss. This envelope concept underscores member agencies' unique situations while taking into account their inputs in identifying practicable ranges of decreases in retail water demands and local production. The Workgroup focused on an acceptable range of Emergency Storage values from 520,000 to 830,000 acre-feet (AF).

Based on input from the process, staff recommends the following:

- The Emergency Storage Objective should increase from 630,000 AF to 750,000 AF. This level of storage would prevent severe water shortages to the region given new information on expected recovery durations.
- Metropolitan should revisit the Emergency Storage Objective periodically, possibly following the completion of any new IRP with the latest information on damage scenarios, local supplies, imported water demand, and attainable conservation.

DETAILED REPORT

Background

Metropolitan's need for Emergency Storage is based on the potential for major earthquake damage to the Colorado River Aqueduct, California Aqueduct, and Los Angeles Aqueduct. Metropolitan coordinates with the member agencies in setting the emergency criteria, which forms the basis for establishing the Emergency Storage. These criteria assume that damage from such a catastrophic event could render the aqueducts that transport imported water supplies to Southern California out of service, isolating the region from its imported water supplies. Metropolitan's objective is to provide regional emergency storage that could allow Metropolitan to deliver supplies to all its member agencies during this period of outage. The Emergency Storage allows Metropolitan to continue deliveries to its member agencies to supplement local water production and release from local storage. This helps avoid severe water shortages during periods when aqueducts are out of service. In addition to Emergency Storage, Metropolitan may draw from dry-year storage during an emergency, if necessary and available.

Metropolitan's emergency planning criteria were previously established and reported in the following documents:

1. Final Environmental Impact Report for the Eastside Reservoir (now named the Diamond Valley Lake) dated October 1991, which was adopted by the Board on September 24, 1991;
2. Southern California's 1996 Integrated Water Resources Plan, which was adopted by the Board on January 9, 1996;
3. Reports on Metropolitan Water Supplies dated February 2002 and March 2003;
4. 2006 IRP Implementation Report, which was presented to the Board on September 11, 2006 and transmitted on October 9, 2006;
5. Metropolitan's Emergency Storage Requirement, a written report presented to the Board on May 11, 2010; and
6. The 2015 Urban Water Management Plan dated June 2016, which was adopted by the Board on May 10, 2016.

Metropolitan's Current Emergency Criteria

Metropolitan's current emergency criteria provide for a six-month water supply at 75 percent of member agencies' retail demand under normal hydrologic conditions. Metropolitan's emergency plan outlines that under catastrophic loss of water supply the following actions will be implemented, which serve as the criteria for determining Metropolitan's Emergency Storage:

1. any existing interruptible water deliveries would be suspended;
2. firm supplies to member agencies would be restricted by a mandatory cutback of 25 percent from normal year retail demand levels;
3. water stored in the surface reservoirs and groundwater basins under Metropolitan's interruptible program would be made available;
4. full local groundwater production, recycled water, and local surface emergency storage reserve production would be sustained; and
5. Metropolitan would draw on its emergency storage as well as other available storage.

These emergency planning criteria were the basis for the current Metropolitan's Emergency Storage planning level of 630, 000 AF.

Review and Update of Metropolitan's Emergency Criteria

The following sections detail the updated assumptions and changed conditions since the last evaluation of Emergency Storage in 2010. These include demand and supply forecasts developed for the 2015 IRP, updated studies on the potential for seismic damage and outage periods for the imported supply aqueducts, and flexibility improvements within Metropolitan's distribution system implemented as a result of recent drought and supply challenges. This new information is critical to the review and update of the emergency criteria, which forms the basis for revising the Emergency Storage.

Outage Period Criteria

The outage period pertains to the amount of time the regional aqueducts that deliver imported water to Southern California may be out of service. This outage period is derived from the estimated restoration timelines based on the nature of potential damage to the aqueduct coupled with the operational ability to deliver supplies to the area served by that specific aqueduct. During an emergency outage period, Metropolitan's member agencies will depend on previously stored imported and local supplies to supplement continued local production in meeting reduced levels of retail demands. It is acknowledged that some areas could be more impacted because they are primarily or exclusively fed by an imported aqueduct which is assumed to sustain damage. However, Metropolitan's objective is to continue building and operating its system with flexibility to respond to various potential damage scenarios.

Recent Seismic Studies

In August 2015, Metropolitan, Los Angeles Department of Water and Power (LADWP), and California Department of Water Resources (DWR) formed the Seismic Resilience Water Supply Task Force (Task Force) for the purpose of collaborating on studies and mitigation measures to improve the reliability of imported water supplies to Southern California. The specific goals of the Task Force included:

- Revisiting historical assumptions regarding potential aqueduct outages;
- Establishing a common understanding about individual agency aqueduct vulnerability assessments, projected damage scenarios, and planning assumptions; and
- Discussing ideas for improving the resilience of Southern California's imported water supplies through multi-agency cooperation.

Through exchange of information and ideas between the three agencies and experts from the industry and academia, the Task Force assessed potential aqueduct damage and restoration timeline for a M 7.8 earthquake on the San Andreas Fault. This scenario assumes severe damage to the Colorado River Aqueduct (CRA), the California Aqueduct, and the Los Angeles Aqueduct (LAA). A complete description of probable seismic damages and repair durations is presented in Metropolitan's *"Seismic Resilience Water Supply Task Force Report No. 1536"* dated June 2017 (http://www.mwdh2o.com/PDF_About_Your_Water/Report1536_Final.pdf).

Table 1 presents a summary of the estimated outage duration under the earthquake scenario based on the nature of damage for each of the aqueducts.

Table 1
Estimated Outage Duration for Imported Supply Aqueducts (M 7.8 earthquake)

Aqueduct	Estimated Outage Duration
Colorado River Aqueduct	2 to 6 months (recovery of 80% CRA capacity) 3 to 5 years (recovery of 100% CRA capacity)
California Aqueduct: East Branch	12 to 24 months
California Aqueduct: West Branch	6 to 12 months
Los Angeles Aqueduct	18 months

Operational Flexibility

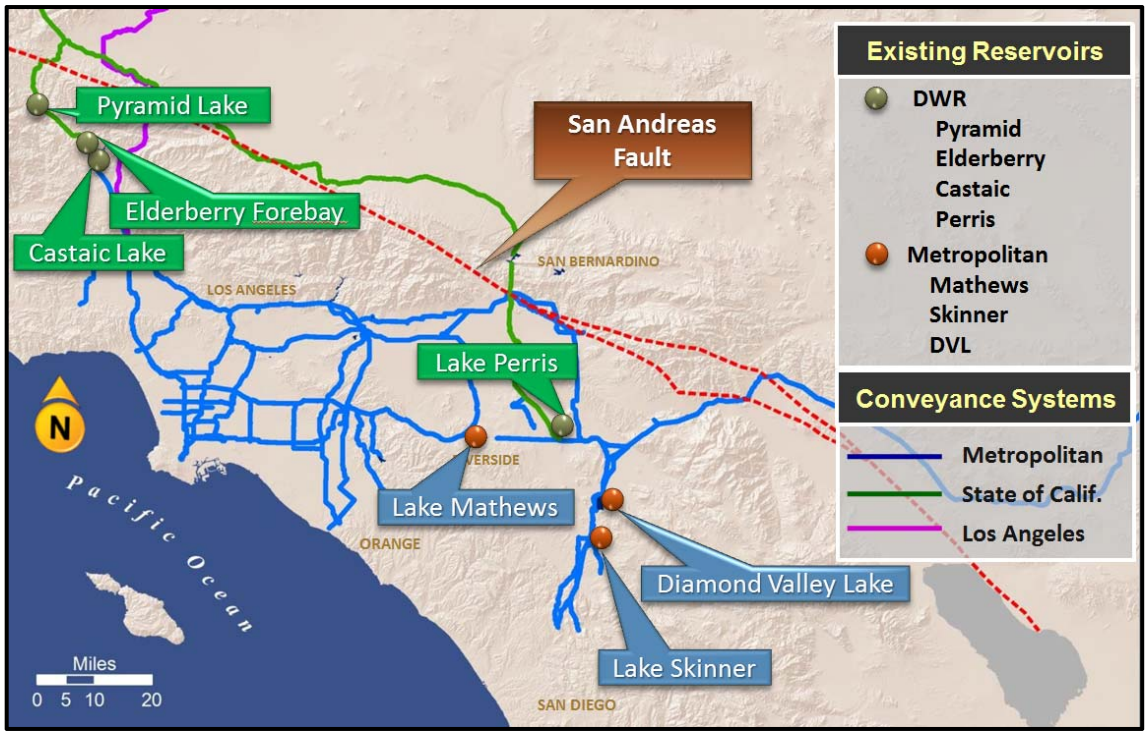
Metropolitan's integrated system provides operational flexibility. The flexibility in Metropolitan's distribution system was demonstrated during the unprecedented drought of 2014-2016. Facing consecutive years of low SWP supplies, Metropolitan pushed CRA and Diamond Valley Lake (DVL) supplies to areas that Metropolitan normally serves only with SWP supplies or at higher blend of SWP. Figure 1 illustrates Metropolitan's operations during that period of extraordinary drought when SWP supplies were at a historic low. Metropolitan can utilize much of the same operational flexibility in its distribution system to facilitate movement of stored supplies during a prolonged outage. This flexibility combined with retail demand reduction through additional conservation and local production at appropriate levels will allow the region to meet its demands in most areas during emergency outages. Although it is not possible for Metropolitan to predict the specific damage to the system in an event of a catastrophic emergency, it seeks to ensure the most flexibility possible throughout the system to respond to different damage scenarios.

Figure 1
Metropolitan Operations during Extraordinary Drought Actions (2014-16)



During an emergency outage, previously stored imported supplies will be withdrawn to meet the region's supplemental water needs. Emergency Storage is used first and dry-year storage is then used, if necessary and available. Figure 2 shows the locations of existing DWR and Metropolitan surface reservoirs in various parts of the region.

Figure 2
Existing DWR and Metropolitan Surface Reservoirs
South of the San Andreas Fault



Metropolitan can draw from emergency supplies stored in Castaic Lake, Elderberry Forebay, and Pyramid Lake during an outage to serve the western areas that previously received SWP water. A limited quantity of CRA supplies could also be available to these areas when 80 percent of the CRA capacity is restored within six months to supplement emergency water needs in this area. Metropolitan can also supply up to 50 cfs of water from Greg Avenue Pump Station to the far western portion of its service area while repairs to the three aqueducts are being completed. This operational flexibility is also useful in the event that stored water was not adequate within the Castaic/Pyramid system.

Metropolitan can draw from emergency supplies stored in DVL, Lake Skinner, Lake Mathews, and Perris Lake during an outage to serve the eastern areas that previously received CRA and SWP water. When the CRA is restored to 80 percent of capacity within six months, it could provide up to 960,000 acre-feet per year (AFY) of imported water to the region. This volume is more than the 15-year historic average (2003 to 2017) CRA delivery of approximately 885,000 AFY and more than the 2015 IRP CRA delivery target of 900,000 AFY for a normal year. During outages, portions of the eastern area are expected to continue to receive treated CRA and/or stored emergency supplies through Weymouth. Some areas that normally receive SWP water from the East Branch may be served by delivering DVL water to Mills through the Inland Feeder/Lakeview Pipeline intertie. Metropolitan recognizes that there are currently no options to supply

the Rialto Pipeline from emergency storage reservoirs during an outage of the East Branch of the California Aqueduct. However, water stored in Silverwood Lake (which is not included in Metropolitan's Emergency Storage portfolio) could be available to supply the Rialto Area as soon as repairs to damaged penstocks and pipelines downstream of Silverwood Lake are completed. This could likely require less time than repairs to the East Branch north of Silverwood Lake. In addition, other potential options to supply the Rialto region include several conceptual pump back operations and increased groundwater storage and extraction capacity for emergencies.

Metropolitan will continue to deliver treated water from stored emergency supplies during an outage and from imported supplies upon service restoration. Four of Metropolitan's five water treatment plants have redundant power feeds from the power provider. A project is currently underway to also equip the fifth plant with a redundant power feed. All five water treatment plants have backup emergency generators that support all treatment processes with the exception of ozone. Disinfection using chlorine would occur when the plants are reliant on generator power for treatment operations during a loss of utility power. Metropolitan maintains a minimum 30 day supply of chlorine in the region.

Updated Outage Criteria

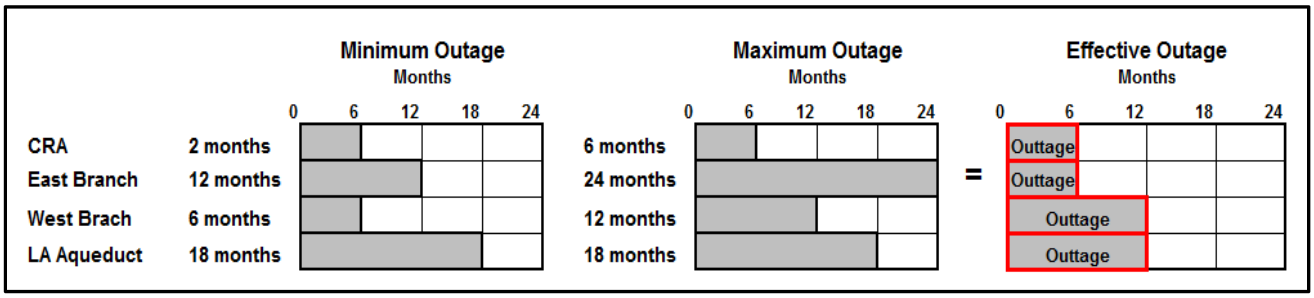
In updating the emergency outage criteria, the Workgroup considered both the duration of aqueduct repair based on the nature of potential seismic damage and recently demonstrated operational flexibilities of Metropolitan's distribution system.

Figure 3 shows the range of outage durations for the CRA, California Aqueduct East and West Branches, and the LAA. The effective outage period is then derived by accounting for the estimated durations of repair for each regional aqueduct coupled with the operational ability to deliver supplies to the area served by that specific aqueduct. In updating the outage period, the Workgroup considered the following operational assumptions:

- The estimated outage duration and repair of LAA under the earthquake scenario is 18 months. However, when the West Branch comes back in service within 12 months, it can supply water to LADWP through LA-35 while the LAA repairs continue.
  - ***Assumed outage period: 12 months for member agencies receiving supplies from West Branch and LAA.***
- The estimated outage duration and repair time of East Branch is 12 to 24 months. However, when 80 percent of the CRA capacity comes back in service within 6 months, CRA supplies would be available to many Metropolitan member agencies that normally receive SWP supplies. Thus, some areas that are normally served with water imported through the East Branch may be served with water imported through the CRA, using delivery of DVL water to Mills and several other options that should be evaluated in the Rialto area discussed above.
  - ***Assumed outage period: 6 months for member agencies receiving supplies from CRA and East Branch (with the exception of Rialto agencies).***

Using these assumptions, the effective new outage criteria presented in Figure 3 calls for storing supplemental supplies for 12 months in the West Branch and LAA areas (supplied by emergency storage in Castaic, Pyramid, and Elderberry) and 6 months in the CRA and East Branch areas (supplied by emergency storage in Perris, Skinner, Mathews, and DVL). In addition to the 12-month stored emergency supplies, West Branch areas could also be served with limited amounts of CRA supplies within 6 months to help meet demands in areas normally served with SWP supplies and higher blend areas. It is not possible to predict the specific damage to the system as a result of a catastrophic event. Therefore, system flexibility is important to ensure all supplies may be moved, if necessary and possible.

Figure 3
Updated Emergency Outage Criteria



Retail Demand Cut Back Criteria

Demand Projection

The first step in calculating the Emergency Storage is to determine the total amount of emergency retail water demand at the member agency level. The Emergency Storage is intended to reflect estimated supplemental water demands on Metropolitan during an emergency outage now updated to a period of 6 or 12 months. Thus, the aggregate of emergency retail demand is used to determine the aggregate supplemental demands on Metropolitan during such emergency, which excludes non-firm deliveries. Those deliveries are assumed to be suspended during an outage, as shown in Table 2.

Calculations of the emergency retail demand are provided for the year 2018 based on forecasts reported in the 2015 IRP. The retail demands in Table 2 were calculated at the member agency level. The numbers shown in this table represent the aggregate total retail demand (M&I and agricultural), replenishment, and seawater barrier demands over the emergency outage period considered. The total retail demands are based on forecasts from the Southern California Association of Government's (SCAG) 2012 Regional Transportation Plan/Sustainable Community Strategy and from the San Diego County Association of Government's (SANDAG) Series 13: 2050 Regional Growth Forecast (October 2013) forecast. The SCAG and SANDAG regional growth forecasts are the core assumptions in the econometric demand modeling for Metropolitan's 2015 IRP.

Table 2
Firm Retail Demands (Average Year)
(Acre-Feet)

	2018 Demands for 6-months and 12-months[(1)]
Total Retail Demand	2,735,617
Replenishment	(197,103)
Seawater Barrier	(52,000)
Firm Retail Demand	**2,486,514**

Note: (1) Retail demands are assessed for the 6-month outage period for member agencies receiving supplies from CRA and East Branch, and 12-months for member agencies receiving supplies from West Branch and LAA (see Attachment A).

Reduced Retail Demands during Emergency Outage

The next step in calculating the emergency storage demand on Metropolitan is to subtract a percentage reduction, or cutback, in water use from the retail demands. For illustrative purposes, Table 3 below shows the resulting reduction in retail demands during emergency outage after a cutback of 25 percent is imposed on the 2018 average condition retail demands. The retail demands in Table 3 are calculated at the member agency level. The numbers represent the aggregated total over the emergency outage period considered.

The assumption of a 25 percent retail demand cutback is a planning criterion that is consistent with previous Metropolitan studies that showed overall outdoor water use at approximately 30 percent. That cutback criterion is also consistent with the Public Policy Institute of California (PPIC) report *(Building Drought Resilience in California's Cities and Suburbs, June 2017)* based on lessons learned during drought. A higher level of austerity, public awareness, and a likely emergency declaration during an outage may support a higher cut back through additional conservation actions.

Table 3
Retail Level Emergency Demands (Average Year)
(Acre-Feet)

	2018 Demands for 6-months and 12-months[(1)]
Firm Retail Demand	2,486,514
25% Reduction (Cutback)	(621,629)
100% IAWP Reduction	N/A
Retail Demand during Emergency	**1,864,885**

Note: (1) Retail demands are assessed for the 6-month outage period for member agencies receiving supplies from CRA and East Branch, and 12-months for member agencies receiving supplies from West Branch and LAA (see Attachment A).

Local Production Level Criteria

The next step in calculating the Emergency Storage is to determine the amount of local supplies (local production of in-region supplies and release from local storage) available to meet retail demands at the member agency level. The local production represents the member agencies' highest potential production from the various types of supplies available within their service areas with consideration to each member agency's supply, capacity, and demand limitations. For this evaluation, the year 2018 forecast from the 2015 IRP is initially used to estimate the local production for the 6-month and 12-month emergency outage periods. In addition, Metropolitan also considered the factors that could limit each member agency's local supplies production. These include:

- Supply limitation – Considers all supplies available during an emergency outage (including additional groundwater rights, allowable over pumping in the basin, or similar mechanism if available and needed)
- Capacity limitation – Considers all available local production capacity (including extra well capacities to produce the any additional groundwater supplies if available and needed)
- Demand limitation – Considers the projected demand during the outage period (to determine the needed supplies from local and supplemental sources)

The Unused Local Production represents the aggregated production of individual member agencies above what is needed to meet their demands. In contrast, the Effective Local Production is the aggregated amount of locally available supplies that are produced to meet the reduced retail demands during an emergency outage. The Effective Local Production is derived by subtracting Unused Local Production from the aggregate total local production. For planning purposes in determining the Emergency Storage for the region, the Effective Local Production is calculated with the assumption that locally available supplies will be used only within the producing member agency's service areas and not be used or exported to meet the demands of other agencies. However, in real emergency outages, it is likely that member agencies would implement region-wide and inter-agency coordination for the most efficient operation and use of available supplies.

As part of evaluating the Effective Local Production, Metropolitan also assessed the additional local groundwater that could be theoretically produced and local surface storage that could be reasonably available during an emergency outage. This evaluation revealed that additional groundwater supplies, while theoretically available, could not be produced due to one or a combination of limiting factors. The local surface storage, on the other hand, includes all reasonably available surface water storage that the member agency could produce and use within its service area during extended shortages. The Local Surface Storage in Table 4 includes SDCWA's calculated Emergency Storage Requirement of 20,000 AF (as reported to their Water Planning Committee in July 18, 2018) and a portion of its carryover storage. Under the Carryover Storage Policy Guidelines, included in SDCWA's Water Shortage Contingency Plan Appendix A dated August 2017, SDCWA will maintain a carryover target volume of 70,000 AF and a maximum of 100,000 AF to be utilized over five consecutive dry-years. During an emergency outage, the region will most likely draw supplies from all reasonably available storage to meet demands. This evaluation reasonably assumes that in addition to its emergency storage, one-fifth of SDCWA's 70,000 AF target carryover storage, amounting to 14,000 AF, would be available for a catastrophic emergency outage based on the low likelihood that that all carryover supplies would have been withdrawn over multiple dry-years.

Table 4 shows the aggregate total for each type of locally available supplies over the emergency outage period considered. For illustrative purposes for 2018, Table 4 also presents the local production at 100 percent, 90 percent, and 80 percent. The LAA production is excluded from this calculation because the Emergency Storage assumes the loss of all imported water supplies. The member agency local production data is included as Attachment A.

Table 4
Effective Local Production
(Acre-Feet)

	2018 Local Production for 6-months and 12-months[1]		
	At 100%	At 90%	At 80%
Groundwater	832,000	748,800	665,600
Surface Water	54,935	49,442	43,948
Local Surface Storage[2]	34,000	30,600	27,200
Recycling and GW Recovery	353,797	318,417	283,038
Seawater Desalination	25,319	22,787	20,255
Los Angeles Aqueduct	0	0	0
Other	13,100	11,790	10,480
IRP Targets[3]	18,087	18,087	18,087
Subtotal Local Production	1,331,238	1,199,923	1,068,608
Unused Local Production	(152,021)	(86,449)	(31,056)
Effective Local Production	**1,179,216**	**1,113,474**	**1,037,551**

Note: (1) Local production are assessed for the 6-month outage period for member agencies receiving supplies from CRA and East Branch, and 12-months for member agencies receiving supplies from West Branch and LAA 9 (see Attachment A).
(2) Local Surface Storage is comprised of emergency storage plus reasonably available storage above emergency.
(3) Conservation and locally available supply targets from the 2015 IRP for Year 2018.

Emergency Demands on Metropolitan

The final step in calculating the Emergency Storage is to subtract the Effective Local Production from the retail demands during an emergency outage for each member agency. The resulting difference represents the supplemental water demands on Metropolitan during an outage period This is the Emergency Storage planning level for the region. Table 5 shows the aggregated totals at varying local production levels for 2018. The table below illustrates that the emergency demand on Metropolitan, and in effect the Emergency Storage, increases as Effective Local Production decreases under the 90 percent and 80 percent scenarios.

Table 5
Emergency Demands on Metropolitan
(Acre-Feet)

	Local Production		
	At 100%	**At 90%**	**At 80%**
Retail Demand during Emergency	1,864,885	1,864,885	1,864,885
Effective Local Production	(**1,179,216**)	(**1,113,474**)	(**1,037,551**)
Metropolitan Emergency Demand	**685,666**	**751,411**	**827,334**

Sensitivity Analysis

A sensitivity analysis of retail cutback and loss of local supplies were conducted. To explore the sensitivities of the Emergency Storage from these two criteria, Metropolitan evaluated various percentages of demand cut backs and levels of local production. Table 6 shows the resulting Emergency Storage at various combinations of retail demand cutback and local production levels. This matrix of emergency storage values presents retail demand cut backs of 0 percent, 25 percent, 35 percent, and 50 percent and local production levels of 100 percent, 90 percent, and 80 percent.

Table 6
Range of Potential Emergency Storage Objectives for Year 2018
(Acre-Feet)

Local Production Level	Retail Demand Cutback			
	0%	25%	35%	50%
100%	1,176,600	685,700	513,300	294,000
90%	1,286,600	751,400	570,700	332,300
80%	1,417,900	827,300	636,300	377,300

Envelope Concept for Metropolitan's Emergency Storage Objective

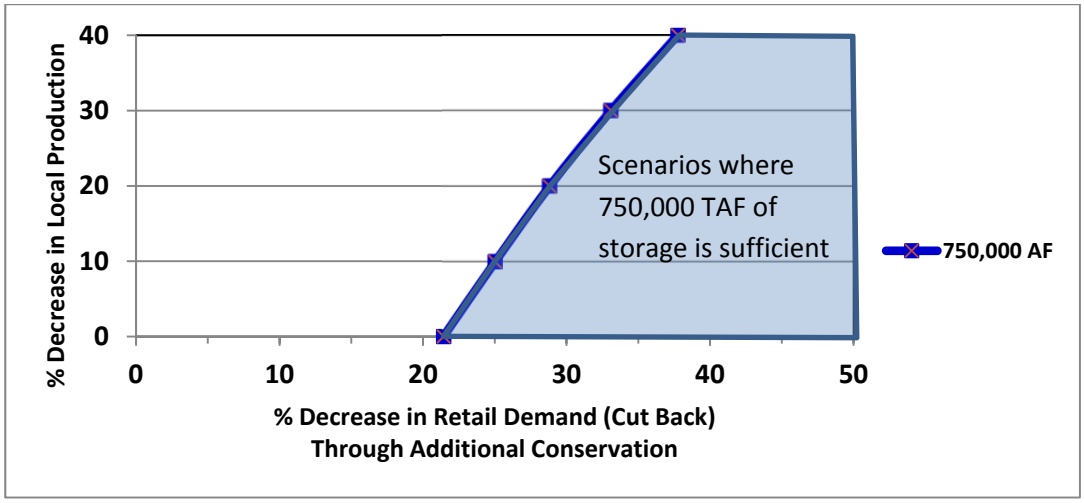
Rather than considering a specific region-wide scenario of conservation and local production loss, the Workgroup discussion led to the development of a range of emergency storage values that could provide reliability during the outage period. The concept of an envelope of solutions emerged, with the idea that an envelope of solutions will yield an appropriate Emergency Storage for the region. The Emergency Storage, in turn, could be achieved through various combinations of (1) retail demand cutback from achievable conservation and (2) local production level taking into account potential damages to local facilities. This envelope concept underscores member agencies' individual and unique situations while taking into account their inputs in identifying practicable ranges of decreases in retail demand and local production.

For the retail demand cut back, most member agencies considered the 25 to 35 percent range to be reasonable. This range is based on the level of conservation that the region was able to achieve during the recent drought. For the local production, several member agencies expected some damage to local facilities during the earthquake. In addition, Metropolitan acknowledges that retail demand cutback may also lead to reduction of non-potable recycled water use. Thus, for local production, the Workgroup focused on a range from 80 percent to 100 percent of the member agencies' reported local production in the 2015 IRP. This would allow contingency planning for uncertainties in damage to local facilities and accommodate different durations of local repairs. This is a modification from the previous assumption of full local production at the IRP level during an outage period.

As indicated in Table 6, a scenario using the criteria of 25 percent retail demand cut back and 100 percent local production level yield an estimated Emergency Storage of 686,000 AF for year 2018. However, the Workgroup focused on an envelope of alternatives for Emergency Storage that could provide reliability during the outage period. The same table matrix of values above highlights the range from 520,000 to 830,000 AF. Within this range, an Emergency Storage of 750,000 AF is recommended. This level of storage would prevent severe water shortages in the region with practicable ranges of reduced demands through conservation and plausible levels of local production during an emergency outage. Figure 4 shows that the

Emergency Storage would be sufficient to cover various combinations of practicable ranges of decreases in retail demand and local production.

Figure 4
Emergency Storage Objective derived from the Envelope Concept



Allocation of Emergency Storage in Regional Reservoirs

Once the Emergency Storage is determined, it can then be allocated to the various surface reservoirs within the region, previously illustrated in Figure 2, south of the San Andreas Fault. The total storage capacity of existing DWR and Metropolitan surface reservoirs and the allocation to emergency storage, seasonal, regulatory, and drought carryover needs are shown in Table 7 through 11. For the DWR reservoirs, the values in the tables reflect the normal maximum operating and dead pool storages indicated in the DWR report *"California State Water Project, Volume III, Storage Facilities, Bulletin 200"* dated November 1974. For this evaluation, recreational waters in DWR reservoirs are assumed to be available for emergency use during outage periods. On a short-term basis for operational purposes, storage at any specific reservoir may be below these planning levels. When this happens, the emergency storage is shifted temporarily to any of the other existing reservoirs.

Department of Water Resources Surface Reservoirs

Table 7 below shows the five major reservoirs owned and operated by DWR in or near Metropolitan's service area. Castaic Lake, Elderberry Forebay, and Pyramid Lake are located on the West Branch of the California Aqueduct. Silverwood Lake and Lake Perris are on the East Branch of the California Aqueduct. The total storage capacity of these five reservoirs is approximately 721,600 AF. When cost allocation factors from DWR Bulletin 132 Appendix B, Table B-2 are applied to the operational storage capacities, Metropolitan's share of storage in the reservoirs is equivalent to 644,400 AF.

Table 7
Allocation of Storage Capacities in DWR Reservoirs
(Acre-Feet)

Reservoir	Total Storage Capacity	Dead Storage	Storage Paid by Others	Storage Paid by Metropolitan
Pyramid Lake	169,900	4,800	7,000	158,100
Castaic Lake	323,700	18,600	12,500	292,600
Elderberry Forebay	28,200	800	1,100	26,300
Silverwood Lake	73,000	4,000	24,300	44,700
Lake Perris	126,800	4,100	0	122,700
Total	**721,600**	**32,300**	**44,900**	**644,400**

Source: California Department of Water Resources (1974). California State Water Project, Volume III, Storage Facilities, Bulletin 200, pages 294, 340, 367, 407, and 408.

From 2005 to 2017, DWR temporarily lowered the maximum storage elevation in Lake Perris because of seismic safety issues. This elevation change resulted in reduction of storage available to Metropolitan in Lake Perris, which was taken into account in past emergency storage evaluations. In 2018, the seismic retrofit of Lake Perris was completed, which restored storage to its full capacity. For purposes of the emergency storage analysis provided herein, it is assumed that 122,700 AF could be available to Metropolitan from Lake Perris. Furthermore, the Monterey Amendment, executed by the DWR and most of the State Water Contractors in 1995 and 1996, addresses the allocation of SWP water in times of shortage and deals with a number of other issues that facilitate more water management flexibility for Contractors.

Table 8 shows the distribution of Metropolitan's emergency storage in DWR reservoirs. Of the total 644,400 AF of storage in DWR Reservoirs that is for Metropolitan use, almost 381,000 AF of this amount is allocated to emergency storage and the remaining 263,600 AF is for seasonal, regulatory, and dry-year storage.

Silverwood Lake capacity does not add to the total Emergency Storage Capacity because of its location outside of major earthquake faults assumed for the emergency storage calculation methodology. However, Silverwood Lake could be available after a seismic event upon restoration of any damaged distribution system components downstream of the lake. It is expected that the portion of the distribution system downstream of the lake could be restored more expeditiously after an event due to its relatively short length, accessibility of the pipelines, and redundancies in the system.

Table 8
Allocation of Emergency Storage in DWR Reservoirs
(Acre-Feet)

Reservoir	Metropolitan Storage Capacity	Seasonal, Regulatory and Dry-Year Storage	Emergency Storage Capacity
Pyramid Lake	158,100	0	158,100
Castaic Lake	292,600	153,900	138,700
Elderberry Forebay	26,300	0	26,300
Silverwood Lake	44,700	44,700	0
Lake Perris	122,700	65,000	57,700
Total	**644,400**	**263,600**	**380,800**

Metropolitan Surface Reservoirs

Table 9 shows the allocation of storage resources in Metropolitan's three major surface reservoirs, Lake Mathews, Lake Skinner, and DVL. These three reservoirs provide approximately 1,036,000 AF of total storage capacity to Metropolitan's service area.

Lake Mathews has available storage of approximately 178,500 AF and distributes CRA water to Riverside, Orange, Los Angeles, and San Bernardino counties. Lake Skinner has approximately 43,800 AF of available storage and receives CRA and SWP water for distribution to Riverside and San Diego counties. DVL is Southern California's largest reservoir with approximately 810,000 AF of total capacity, with 798,500 AF of available capacity to meet demands and provide emergency water supplies.

Table 9
Allocation of Storage Capacities in Metropolitan Reservoirs
(Acre-Feet)

Reservoir	Total Storage Capacity	Dead Storage	Available Capacity
Lake Mathews	182,000	3,500	178,500
Lake Skinner	44,000	200	43,800
Diamond Valley Lake	810,000	11,500	798,500
Total	**1,036,000**	**15,200**	**1,020,800**

Table 10 shows the components of storage, including emergency, seasonal, regulatory, and dry-year storages, for all of Metropolitan's reservoirs. Under the recommended Emergency Storage of 750,000 AF, out of the roughly 1,021,000 AF of available Metropolitan storage capacity, approximately 369,200 AF are reserved for emergency storage, with the remaining storage capacity available for seasonal, regulatory, and dry-year storage.

Table 10
Allocation of Emergency Storage in Metropolitan Reservoirs
(Acre-Feet)

Reservoir	Available Capacity	Emergency Storage Objective at 750 TAF	
		Seasonal, Regulatory and Drought Storage	Emergency Storage
Lake Mathews	178,500	100,000	78,500
Lake Skinner	43,800	10,000	33,800
Diamond Valley Lake	798,500	541,600	256,900
Total	**1,020,800**	**651,600**	**369,200**

Emergency Storage Capacities in DWR and Metropolitan Reservoirs

The Emergency Storage presented in this white paper is evaluated based on regional aggregation of retail demands and locally available supplies within the service area. The resulting Emergency Storage is assumed to be distributed amongst the available capacities within the existing DWR and Metropolitan surface reservoirs. During an outage, Metropolitan delivers supplement water to member agencies from previously stored emergency supplies, and dry-year supplies if necessary and available, based on the most effective operation of the distribution system under emergency conditions.

Table 11 presents the storage of emergency supplies in DWR Reservoirs, Lake Mathews, and Lake Skinner to be fixed quantities, with any remaining need reflected as changes in DVL's emergency storage allocation under the recommended 750,000 AF of Emergency Storage.

Table 11
Allocation of Emergency Storage in Existing Reservoirs(1)
(Acre-Feet)

Reservoir	Emergency Storage Objective at 750 TAF
Pyramid Lake	158,100
Castaic Lake	138,700
Elderberry Forebay	26,300
Lake Perris	57,700
Lake Mathews	78,500
Lake Skinner	33,800
Diamond Valley Lake	256,900
Total	**750,000**

Note: (1) This allocation provides operational guidance but does not create a minimum emergency storage volume in any single reservoir.

Conclusion

This white paper summarizes the progress to date of the Workgroup coordination process to estimate a planning objective for the region's emergency storage, as part of Metropolitan's ERSP. Evaluating the Emergency Storage involves the regional aggregation of retail water demands and locally available supplies within the service area. It also accounts for the member agencies' unique situations in identifying practicable ranges of additional conservation actions that could yield decreases in retail demand and levels of local production that could be accomplished during emergency outage.

Under the new envelope concept, the Workgroup focused on an acceptable range of regional emergency storage values from 520,000 to 830,000 AF. **Based on feedback to date, staff recommends an Emergency Storage of 750,000 AF.** This level of storage would prevent severe water shortages for the region with practicable ranges of water demand reduction achievable conservation actions and plausible levels of local production. This recommended regional emergency storage is assumed to be distributed amongst the available capacities within the existing DWR and Metropolitan surface reservoirs, as shown in Table 11.

The Emergency Storage presented in this white paper is a regional planning objective. It is an estimate for the amount of Metropolitan water that the region targets to store in preparation for a catastrophic earthquake event. This evaluation of Emergency Storage is not intended to set a basis or a policy for allocating or apportioning storage for each individual member agency.

The Workgroup proposes that this storage objective be revisited periodically, possibly following the completion of a new IRP. Metropolitan also considers spatial distribution for the purpose of determining generally where to store its emergency water. However, specific operations during an emergency will depend on the actual conditions at that time. Since member agency demands for supplemental water will be met through deliveries of supplies from storage, evaluation of spatial distribution of storage and most effective operation of the distribution system will be accomplished as part of Metropolitan's continued efforts and coordination within the ERSP's storage portfolio evaluation or other regional planning processes.

Attachment A

2018 Member Agency Total Retail Demand and Local Production
(Source data for Tables 2, 3, and 4)

	Total Retail Demand	Groundwater	Surface Production	Recycling + GW Recovery Reclamation	Other Imports	Seawater Desal	Local Surface Storage	IRP Target	
Agencies at 6 month Outage									
Foothill MWD	9,204	3,970	200	120	0	0	0	67	
Pasadena	16,217	6,000	0	0	0	0	0	118	
San Marino	2,700	2,250	0	0	0	0	0	20	
Three Valleys MWD	63,226	21,650	3,100	4,384	0	0	0	447	
Upper San Gabriel MWD	106,945	74,163	4,500	4,354	0	0	0	625	
Anaheim	34,253	23,932	0	39	0	0	0	249	
Fullerton	14,315	10,376	0	0	0	0	0	104	
MWDOC	310,510	107,945	2,000	93,163	0	0	0	1,651	
Santa Ana	19,074	13,478	0	160	0	0	0	139	
Eastern MWD	126,051	40,400	1,550	25,112	0	0	0	890	
Western MWD	147,318	73,700	2,750	21,295	0	0	0	1,064	
IEUA	143,302	74,800	16,240	28,573	0	0	0	969	
San Diego County Water Authority	315,373	5,900	24,595	19,956	0	25,319	34,000	2,204	
Agencies at 12 month Outage									
Central Basin MWD	296,066	182,300	0	55,972	0	0	0	1,590	
Compton	7,766	6,400	0	0	0	0	0	56	
Long Beach	68,633	28,700	0	10,118	0	0	0	452	
Torrance	28,420	2,700	0	9,150	0	0	0	207	
West Basin MWD	179,750	34,600	0	33,621	0	0	0	1,173	
Santa Monica	13,732	8,200	0	145	0	0	0	100	
Burbank	27,819	300	0	13,985	0	0	0	159	
Glendale	30,319	1,500	0	8,984	0	0	0	221	
Los Angeles	566,486	77,794	0	11,681	0	0	0	4,070	
San Fernando	3,150	3,143	0	0	0	0	0	23	
Calleguas MWD	164,638	27,700	0	7,483	13,100	0	0	1,198	
Beverly Hills	11,938	0	0	700	0	0	0	87	
Las Virgenes MWD	28,413	100	0	4,804	0	0	0	207	
MWD TOTAL	**2,735,617**	**832,000**	**54,935**	**353,797**	**13,100**	**25,319**	**34,000**	**18,087**	**1,331,238**

Note: Member agency local production are approximation for year 2018 based on 2015 IRP and are estimated for the outage periods indicated.
This table shows individual member agency estimates used to develop Metropolitan's Emergency Storage Objective for the region.
For agencies along the Rialto Pipeline, see discussion on pages 5-6 related to system limitations for receiving CRA supplies.
Local surface storage includes all reasonably available surafce storage that the member agency could produce and use within its service area. Includes SDCWA's calculated ESP storage requirement reported to their Water Planning Committee in July 2018 and a portion of their target carryover storage as discussed in page 9.

Appendix 8

SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

Appendix 8
SEISMIC RISK ASSESSMENT AND MITIGATION PLAN

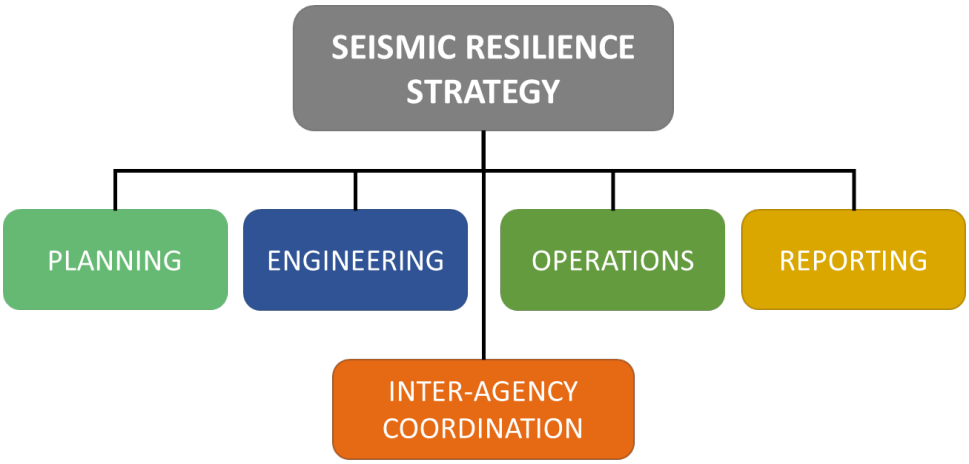
Beginning January 2020, CWC Section 10632.5 mandates UWMPs to include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. For Metropolitan, this required assessment and plan are accomplished as part of developing its resilience strategy and are presented in detail in the seismic resiliency report attached to this appendix.

Over its nearly 90-year history, Metropolitan has been proactive in mitigating seismic risks posed to its expansive infrastructure, as well as improving its ability to maintain (or quickly restore) water deliveries following a major earthquake. This ability to mitigate seismic risks and maintain (or quickly restore) water deliveries following a seismic event is referred to as "seismic resilience." Metropolitan's holistic strategy for seismic resilience follows a "defense in depth" multi-layered approach for managing risk. Metropolitan's Seismic Resilience Strategy has three primary objectives:

1. Provide a diversified water supply portfolio, system flexibility, and emergency storage
2. Prevent damage to water delivery infrastructure in probable seismic events and limit damage in extreme events
3. Minimize water delivery interruptions through a dedicated emergency response and recovery organization

Metropolitan's Seismic Resilience Strategy is implemented through four components that encompass the various internal functions that promote the organization's seismic resilience objectives. These components are supplemented by Metropolitan's commitment to inter-agency coordination when preparing and responding to a seismic event and other emergencies. The strategy is shown below in Figure A.8-1.

Figure A.8-1
Seismic Resiliency Strategy



The various components of Metropolitan's resilience strategy are described in detail in Metropolitan's Seismic Resilience Report First Biennial Report (February 2018) and subsequent updates. The most recent update, Seismic Resilience Report 2025 Update (July 2025), is presented as part of this appendix. These reports are also available on Metropolitan's website: https://www.mwdh2o.com/how-we-plan/

REPORT

SEISMIC RESILIENCE REPORT
2025 UPDATE



The Metropolitan Water District of Southern California

700 N. Alameda Street, Los Angeles, California 90012

Report No.
2025 MWD08 01S1
August 2025

Seismic Resilience Report 2025 Update

Prepared By:

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Report Number 2025 MWD08 01S1
August 2025

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Additional copies: The Seismic Resilience Report is located on the Seismic Resilience SharePoint site. To obtain a copy of this document, please contact the Engineering Services Group.

Disclaimer

Extensive efforts have been made to ensure that the material contained in this document is accurate as of the date of publication. There are many factors, however, related to the content and applicability of this document which are beyond the control of MWD. In addition, the contents of this publication will be periodically updated, so the reader should inquire about any such changes in addition to reading this document. Finally, the reader is encouraged to seek appropriate technical and/or legal advice when specific facts or circumstances arise that raise questions concerning the applicability or interpretation of the policies and procedures discussed herein.

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Cover Photo: Installation of 104-inch diameter earthquake-resistant ductile-iron pipe on Metropolitan's Casa Loma Siphon

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1 Executive Summary

The 2025 Seismic Resilience Report provides an overview of Metropolitan's current seismic resilience strategy and the infrastructure improvements made to mitigate potential impacts to facilities and systems from earthquake hazards. The report maintains continuity with the 2020 Seismic Resilience Report, which listed goals for the purpose of enhancing seismic resilience for the 5-year planning period. Metropolitan's seismic resilience strategy is comprised of four main components – Planning, Engineering, Operations, and Reporting.

Under the Planning component, water supply diversification and improved system flexibility continue to be the primary goals for increased resilience. The Diamond Valley Lake to Rialto Pipeline Project and Sepulveda Feeder Pump Project will improve Metropolitan's ability to move Colorado River or stored water within Diamond Valley Lake to member agency service areas that are highly dependent on State Water project supplies improving both drought and seismic resilience for these areas. Additionally, the proposed Pure Water Southern California will provide a new reliable water source for the region in case of a seismic event impacting the region's imported water supplies.

Under the Engineering component, staff continues to implement the Seismic Upgrade Program, which aims to improve the performance of existing facilities against seismic events. Dam safety continues to be a priority with the initiation of a new Dam Safety Risk Assessment program and an initiative to modernize Metropolitan's existing dam monitoring systems, both initiated in 2023. Additionally, staff continues to conduct systemwide seismic assessments utilizing the latest technologies and updated methodologies for evaluating the risk of the infrastructure system.

Under the Operations component, Metropolitan continues to conduct emergency exercises in coordination with member agencies and regional partners. An example is the planning exercise with the California Department of Water Resources (DWR) and Los Angeles Department of Water and Power (LADWP) as part of the Seismic Resilient Water Supply Task Force to identify areas of improvement for strengthening the region's imported water network against future seismic events. Building up in-house fabrication and construction capacity allows Metropolitan to react to potential seismic damage quickly and effectively minimize interruptions to system operations. Upgrade of the La Verne fabrication shops and investment in heavy construction equipment have significantly improved Metropolitan's capability to restore its infrastructure system and assist in the region's recovery after a major seismic event.

Under the Reporting component, staff continues to provide annual seismic resilience updates to the Board as part of the infrastructure resilience updates to report progress and receive

feedback. Meanwhile, the 2025 Seismic Resilience Report summarizes achievements in the last five years and lays out the plan and focused areas for the next five years to continuously enhance infrastructure seismic resilience. Included in the report is a section on DWR's seismic program highlighting seismic preparedness accomplishments of the last five years related to the State Water Project, including the completion of the Perris Dam Seismic Remediation Project in 2022 and the Castaic Dam Tower Bridge Seismic Retrofit Project in 2023. Current activities include the design of modifications to the Castaic Dam Intake Tower and Outlet Works and emergency response planning.

The availability of water following a large seismic event will be vital for fire suppression, the general welfare of the public, and the region's economic stability. As documented in this report, Metropolitan has established a robust strategy for preparing and responding to seismic hazards. Since 2000, Metropolitan has invested more than $700 million toward seismic resilience, including pre-event risk mitigations and post-event restoration capacity, and will continue to incorporate seismic resilience in its planning and design activities.

2 Introduction

2.1 Purpose

The Metropolitan Water District of Southern California (Metropolitan) owns and operates a complex conveyance, treatment, and distribution system that serves a 5,200-square-mile service area within an active seismic region. Over its 95-year history, Metropolitan has been proactive in mitigating seismic risks posed to this expansive infrastructure, as well as improving its ability to maintain (or quickly restore) water deliveries following a major seismic event. This ability to mitigate seismic risks and maintain (or quickly restore) water deliveries following a seismic event is referred to as "seismic resilience." Metropolitan's strategy for seismic resilience follows a multi-layered approach for managing risk: providing a diversified water resource portfolio, system flexibility, emergency water storage, robust emergency response capabilities, and performing cyclical assessments of facilities and addressing identified vulnerabilities.

In February 2018, Metropolitan published *Report No. 1551 (2020 MWD02 01S1), Seismic Resilience First Biennial Report*, which provided an in-depth review of seismic events affecting Metropolitan and summarized Metropolitan's historical approach to mitigating seismic risk. The document also defined Metropolitan's current Seismic Resilience Strategy, the core components of that strategy, and identified performance objectives and near-term goals. An update was published in 2020 highlighting organizational achievements toward improved seismic resilience.

The *2025 Seismic Resilience Report* documents revisions to Metropolitan's Seismic Resilience Strategy, summarizes seismic-resilience-related studies completed since the publication of the last report; lists milestones related to structural upgrades, dam seismic safety enhancement, and emergency response planning; and highlights achievements in meeting seismic performance objectives and near-term goals. The report also identifies new performance objectives and goals that will further increase the seismic resilience of Metropolitan's infrastructure system.

2.2 Seismic Risk

Southern California is crossed by several faults of varying levels of activity that can generate large earthquakes and cause widespread damage. The region's imported water conveyance facilities – Metropolitan's Colorado River Aqueduct, the State Water Project California Aqueduct (California Department of Water Resources), and the Los Angeles Aqueduct (Los Angeles Department of Water and Power) are all crossed by the San Andreas Fault. Other faults cross different pipelines within Metropolitan's conveyance and distribution system, potentially impacting different sections of Metropolitan's service area. Ruptures of one of these faults can result in intense shaking and permanent ground displacements, causing damage to pipelines,

tunnels, building structures, and other treatment and distribution components. Figure 2-1 shows the major fault lines that cross Metropolitan's service area.

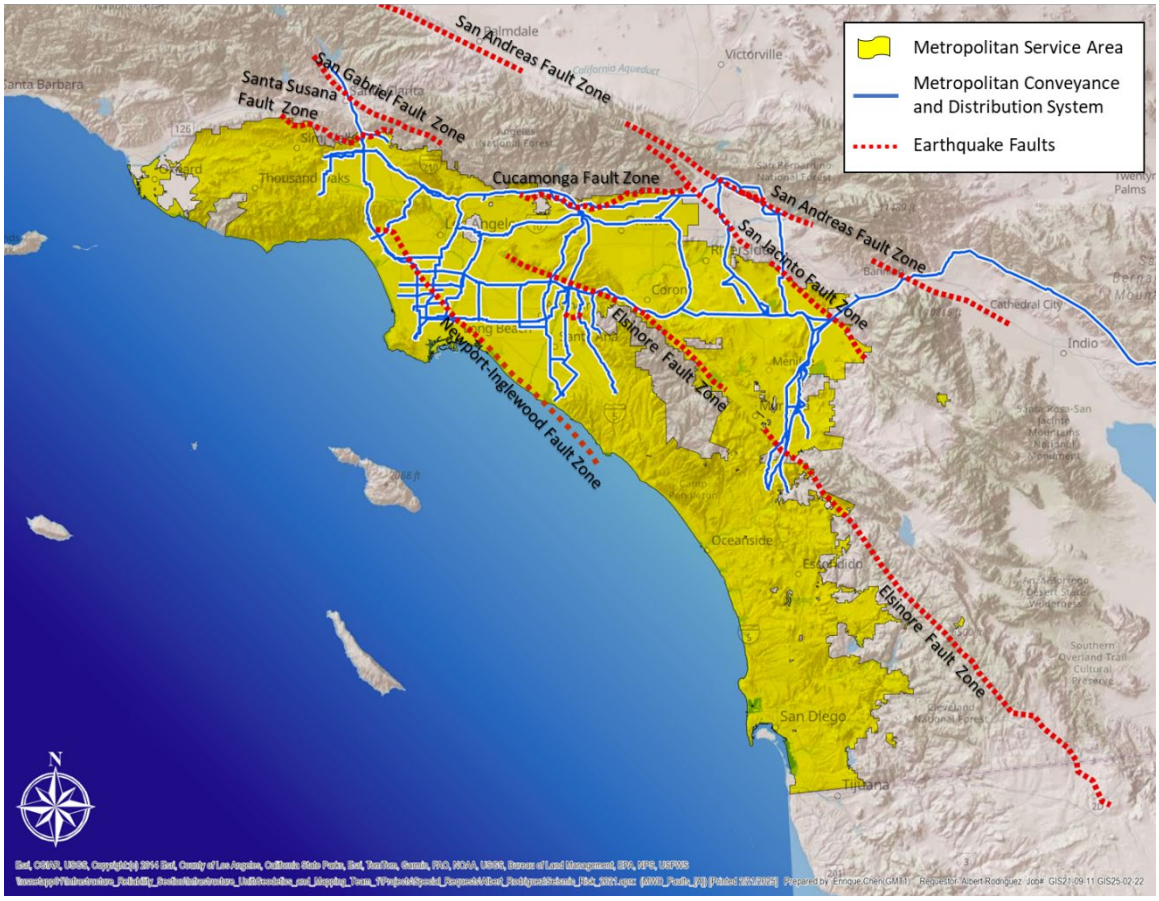


Figure 2-1: Major Southern California Faults in Metropolitan Service Area

2.3 Seismic Resilience Strategy

The Seismic Resilience Strategy has the following objectives which are applicable to Metropolitan's infrastructure and the region's resilience:

- Provide a diversified water supply portfolio, system flexibility, and emergency storage
- Prevent damage to water delivery infrastructure in probable seismic events and limit damage in extreme events
- Minimize water delivery interruptions through a dedicated emergency response and recovery organization
- Prepare for restoration by implementing resilient measures such as stockpiling materials, pre-event design, and emergency contractor retention

Metropolitan's Seismic Resilience Strategy was described in detail in the 2018 Report, and the overall structure of the strategy remains intact with refinements to reflect the maturity of the overall program and the emphasis on implementation. A detailed breakdown of the current Seismic Resilience Strategy is provided in Figure 2-2. The figure provides an overview of the comprehensive efforts taken to mitigate impacts from large earthquakes, to quickly respond following an earthquake event, and to provide transparency regarding seismic risk mitigation measures and receive feedback to facilitate improvements.

As shown in Figure 2-2, in addition to the activities conducted under the Planning, Engineering, Operations, and Reporting components of the Seismic Resilience Strategy, Metropolitan has continued its involvement with the Seismic Resilient Water Supply Task Force. The Seismic Resilient Water Supply Task Force is a collaboration between Metropolitan, the California Department of Water Resources (DWR), and the Los Angeles Department of Water and Power (LADWP) to improve the seismic resilience of the imported water supplies.

Investments in seismic mitigation must be balanced with other Metropolitan priorities to ensure effective and efficient risk mitigation. Since 2000, Metropolitan has invested more than $700 million toward seismic resilience. Investments include upgrade of facilities and pipelines to meet seismic performance goals and improving emergency response capabilities.

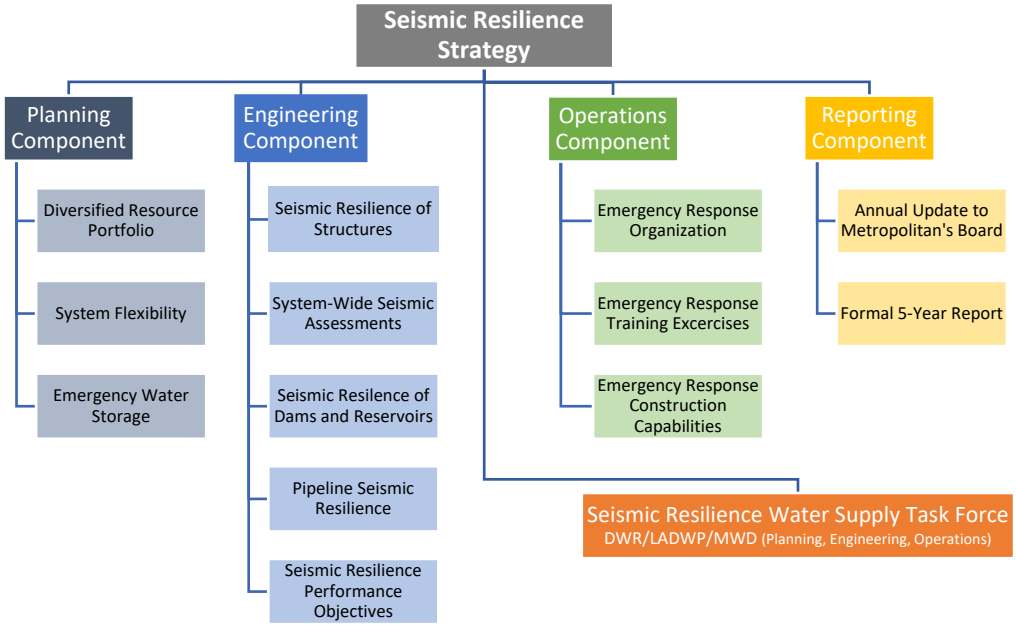


Figure 2-2: Seismic Resilience Strategy and Focus Areas

3 Planning Component

As a primary supplier to the Southern California water community, Metropolitan faces many challenges in meeting the region's needs for water supply reliability and quality. One of the challenges is the ability to maintain water deliveries within the region following a major seismic event. In general, Metropolitan's planning efforts focus on meeting peak demands during normal operations. However, during the original planning for Diamond Valley Lake (DVL), Metropolitan considered a scenario and planned to meet regional demands if imported supplies were interrupted due to a seismic event, leading to the development of a significant increase in storage dedicated to meeting demands during emergencies.

Since 2000, Metropolitan has provided about 49 percent (ranging annually between 38 and 56 percent) of the total water used in its service area from the Colorado River (via the Colorado River Aqueduct) and from the Sacramento-San Joaquin River Watershed (via the State Water Project). In addition to relying on imported supplies, Metropolitan and its member agencies have developed other sources, including groundwater, surface water, recycled water, desalination of seawater, and an aggressive water conservation and water use efficiency program. These investments, and Metropolitan's ongoing efforts in several different areas, coalesce toward the goal of long-term regional water supply reliability.

Metropolitan's Integrated Water Resources Plan (IRP) is the foundation for planning and developing a diverse water supply and emergency storage. The fundamental goal of the IRP is for Southern California to develop a water supply portfolio that will be able to maintain a reliable water supply. Maintaining this reliability includes making investments prior to major seismic events when there could be extended outages of imported water conveyance systems. To meet this fundamental IRP goal of a diversified water portfolio, Metropolitan believes in investing in the reliability of imported supplies, incentivizing its member agencies to develop increased water conservation, recycling, storage, and other resource-management programs. A significant part of imported water supply reliability is preparing for recovery periods following seismic events. With the commencement of the IRP process in 1993, Metropolitan formalized this process as a long-term strategy and official policy.

Metropolitan's success in improving water supply reliability by diversifying its water resource portfolio and by the application of adaptive resource management approaches has also increased seismic resilience. At a system level, the Planning component of seismic resilience has several facets:

- Diversified water supply portfolio
- System flexibility
- Emergency storage

3.1 Diversified Water Portfolio

Metropolitan has undertaken several planning initiatives over the years to maintain a diversified water portfolio. These initiatives include the IRP, periodic IRP updates, the Water Surplus and Drought Management (WSDM) Plan, and the Water Supply Allocation Plan (WSAP). Collectively, these initiatives provide policy framework guidelines and resource targets for Metropolitan to ensure regional water supply reliability, along with additional resilience for seismic events. In addition to Metropolitan's efforts to coordinate regional supply planning through its inclusive IRP process, Metropolitan's member agencies also conduct their own planning analyses and may develop projects independently of Metropolitan.

3.1.1 2020 IRP Regional Needs Assessment

The 2020 IRP Regional Needs Assessments strengthens the adaptive management approaches employed in prior updates through the incorporation of an explicit scenario planning step. With knowledge gained from the completion of the full "planning cycle" from the original 1996 IRP, Metropolitan was able to use the lessons learned from the previous 25 years to conduct the 2020 IRP Regional Needs Assessment. The key lesson is that the future is not predictable; rather, future outcomes are a function of many diverse drivers that are out of the control of the water community. The purpose of scenario planning is to broaden the understanding of plausible, but uncertain, future conditions affecting both supplies and demands. On the demand side, uncertainties surrounding future economic conditions, the extent to which local supplies are developed, and water use behavior will guide member agency dependence on Metropolitan in meeting their retail demands. On the supply side, factors such as climate change and regulatory uncertainty are expected to affect future supply availability in unpredictable ways.

The Regional Needs Assessment outcomes can be summarized through a set of findings grounded in the scenario reliability analysis. The findings fall within five key focus areas:

- SWP Dependent Areas – addressing identified vulnerabilities in the portion of Metropolitan's service area dependent upon State Water Project deliveries (the "SWP Dependent Areas");
- Storage – storage capacity, put/take capabilities, and accessibility as critical considerations in reliability and reducing the need for new core supply development;
- Retail Demand/Demand Management – managing variability in demand through appropriate regional measures and efficient water use;
- Metropolitan Imported Supplies – maintaining existing imported supply reliability and addressing risks to existing imported supplies from various drivers of uncertainty; and
- Local Supply – maintaining existing and developing new local supplies as a critical element of managing demands on Metropolitan.

The Regional Needs Assessment presents key technical findings and examines the effectiveness of generalized portfolio categories. It frames and guides the establishment of more specific targets to maintain reliability over the planning period and informs the Board on resource investment decisions as well as the establishment of a plan to fund them. Considering future uncertainties inherent in long-term resource planning, including uncertainties about climate change and regulatory requirements, as well as Southern California's population and economy, this scenario planning approach better prepares the region for a wider range of potential outcomes by identifying solutions and policies across a variety of possible future conditions. This strategy is designed to enable Metropolitan and its member agencies to manage future challenges and changes in California's water conditions and to balance investments with water reliability benefits.

3.1.2 Water Surplus and Drought Management (WSDM) Plan

Diversifying the region's water supplies and developing adequate and healthy water storage reserves have proven to be the backstop for water supply reliability. These actions have also contributed to improved seismic resilience for the region. Stored water reserves provide certainty for meeting the needs of the region when traditional sources of supply are challenged by drought, climate change, seismic events, and other risks. It is critical that these storage resources be developed, managed, maintained, and enhanced.

Metropolitan's WSDM Plan, which defines a regional water management strategy for Metropolitan and its member agencies, has focused on using storage to manage water supplies and enhance reliability since 1999. The WSDM Plan includes the following 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 periods of shortage.

3.1.3 Water Supply Allocation Plan

When continued drought, earthquakes, or other natural disasters lead to shortages of supplies, Metropolitan distributes a limited amount of water through its Water Supply Allocation Plan (WSAP). First developed in 2008, Metropolitan's WSAP takes a basic premise —to fairly distribute a limited amount of water supply—and applies it through a detailed methodology to reflect a range of local conditions and needs of the region's retail water consumers. In particular, under severe drought conditions or a potential seismic event that impacts imported conveyance systems, it may be necessary and prudent to call for greater reductions in the use of limited water supplies and to reduce reliance on storage reserves. The WSAP has 10 levels of water supply allocations, each corresponding to a five percent reduction of supply. A Level 2 allocation, for example, represents a reduction of approximately 10 percent in the overall water supply

available to each member agency. The level of WSAP reduction implemented would correlate to the severity of interruption caused by the seismic event.

3.2 System Flexibility

Metropolitan develops its facilities to meet demands; however, in the course of developing a reliable system to meet demands, some flexibility has been incorporated into the system. This flexibility helps Metropolitan accommodate changes in water supply, demands, and water quality. System flexibility also helps mitigate the impacts of scheduled and unscheduled outages. Metropolitan's system flexibility has two key components:

- Operational flexibility: the ability to respond to changes in regional supply, water quality, or member agency demands
- Delivery flexibility: the ability to maintain partial to full deliveries during scheduled and unscheduled facility outages

Metropolitan has found that for scheduled and unscheduled outages of Metropolitan facilities, system flexibility at the regional and local levels is key to minimizing the effects of these outages. Water supply reliability and water demand-driven projects increase Metropolitan's system flexibility, which in turn can also increase seismic resilience. For example, the Diemer and Jensen water treatment plants (and associated feeders) were constructed as water demand-driven projects that also significantly improved delivery flexibility and seismic resilience within Metropolitan's distribution system. The service areas for these water treatment plants and the Weymouth Water Treatment Plant overlap creating the Common Pool service area (Figure 3-1), which can be supplied by the other two plants if one is removed due to a planned or unplanned outage. More recent examples include the Inland Feeder-Lakeview Pipeline interconnection, which improved the supply reliability of the Mills Water Treatment Plant by enabling the delivery of water from Diamond Valley Lake, and upgrades to the Greg Avenue Pump Station, which can deliver water from Weymouth into areas normally supplied by the Jensen Water Treatment Plant. These projects were initiated in response to drought, and also provide additional reliability against seismic events.

More recently, drought conditions between 2020 and 2022 in Northern California resulted in historic low allocations from the SWP with consecutive 5 percent allocations. The drought highlighted needed improvements in the system to move alternative supplies into those areas highly dependent on SWP supplies. As a result, Metropolitan has implemented two projects that will enable delivery of Colorado River or stored SWP supplies within DVL to the SWP dependent areas. The first project, DVL Storage to Rialto Pipeline Delivery, will enable pumping of up to 120 cfs of stored water within DVL to the Rialto Pipeline service area. The second project, the Sepulveda Feeder Pump Project (SFPP) Stage 1, will provide up to 30 cfs of additional supply to member agencies in Metropolitan's western SWP dependent area.

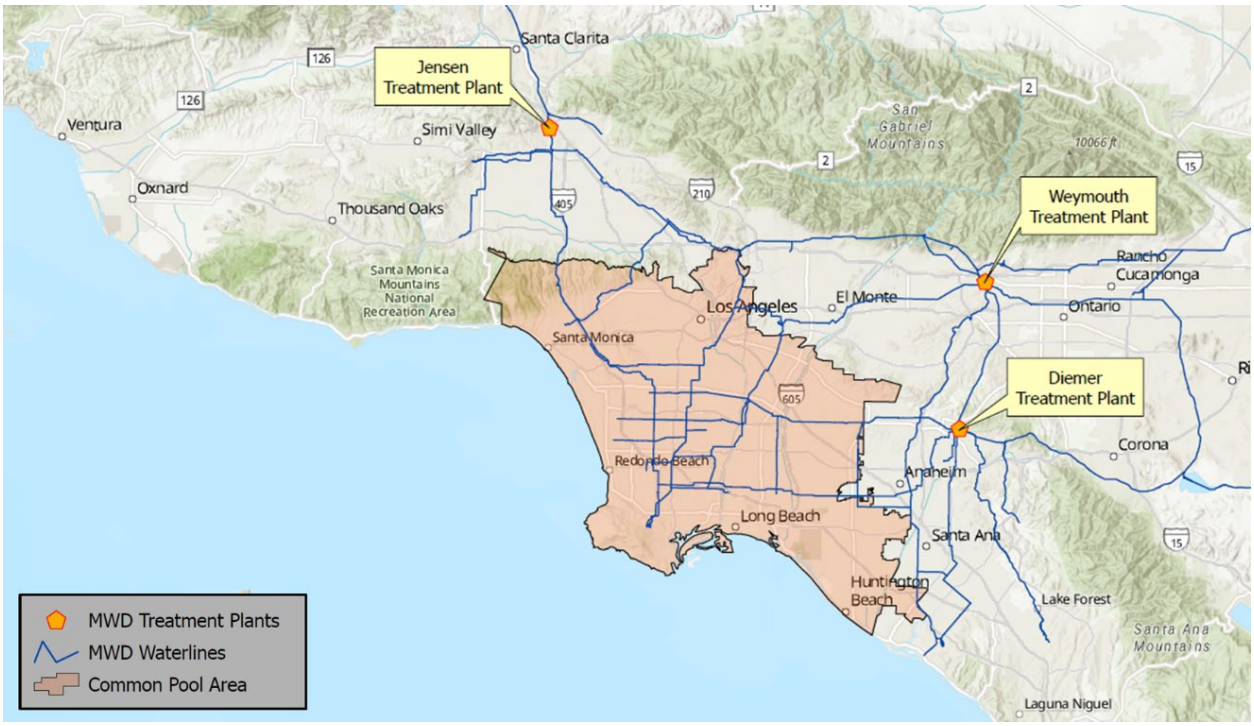


Figure 3-1: The Common Pool Service Area can be supplied by the Weymouth, Diemer, and Jensen Water Treatment Plants

While these projects are intended to improve the drought resilience of the SWP dependent areas, they will also provide benefits in case of a seismic event impacting deliveries of imported supplies to these areas.

3.3 Emergency Storage

Emergency storage requirements are based on the potential for a major earthquake that would damage all supply aqueducts, isolating Southern California from its imported water sources. Metropolitan maintains emergency storage throughout multiple reservoirs located on the coastal side of the San Andreas Fault.

In 2019, Metropolitan and its member agencies completed a collaborative process to update the regional planning estimate of Metropolitan's Emergency Storage Objective. This emergency storage represents the amount of water that Metropolitan would store for the region in preparation for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California, including the Colorado River Aqueduct, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct.

The emergency storage allows Metropolitan to deliver reserve supplies to its member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service. The Emergency Storage Objective

incorporates three main considerations: 1) a six- and twelve-month outage period for the imported supply aqueducts based on the latest assessment[1] and operational flexibility of Metropolitan's system; 2) a retail water demand cutback ranging from 25 to 35 percent given the level of conservation that the region achieved during recent droughts; and 3) an aggregated loss of 10 to 20 percent of local supplies accounting for factors that could affect local production during emergency conditions. The methodology and recommendation of the workgroup were described in detail in a draft white paper, "2018 Evaluation of Regional Storage Portfolio: Draft Evaluation of Metropolitan's Emergency Storage Objective," and presented to Metropolitan's Board in May 2019[2].

Under this update, Metropolitan's Emergency Storage Objective was set to 750 TAF, as this level of storage would prevent severe water shortages in the region given the latest estimate on expected recovery durations. The emergency storage volume represents a planning estimate for the amount of water that Metropolitan would store for the region in preparation for a catastrophic earthquake or other disasters. It is not intended to set a basis or a policy for allocating or apportioning storage for any individual member agency.



Figure 3-2: Emergency Storage is allocated throughout multiple reservoirs such as Diamond Valley Lake (shown)

3.4 Other Actions

Metropolitan is evaluating the implementation of a large-scale recycled water project, Pure Water Southern California (PWSC). PWCS is a collaboration with the Los Angeles County Sanitation Districts (LACSD) that will purify up to 150 million gallons per day of treated wastewater from the LACSD's A.K. Warren Water Resource Facility in Carson for groundwater augmentation and potential incorporation at Metropolitan's treatment facilities, which can then be treated and delivered through Metropolitan's distribution system. PWSC's location within the Los Angeles basin will improve the region's seismic resilience by providing another water source for Metropolitan's member agencies in case of a seismic event that impacts the region's imported water supplies for an extended period.

3.5 Summary

Through its IRP, Metropolitan has established a fundamental goal that Southern California will have a reliable water supply system for present and future generations, even if imported water supplies are disrupted due to a major seismic event. This reliability is achieved through Metropolitan's collaborative efforts with its member agencies in developing local water supplies, emphasis on water conservation, and establishment of emergency storage on the coastal side of major earthquake faults that are crossed by the SWP, CRA, and LAA. These reliability actions enable Metropolitan to continue water deliveries during the period when imported supply aqueducts are out of service due to damage from a major seismic event. Metropolitan also continues to coordinate with state and regional entities to develop robust plans to bring back the imported supply aqueducts in service to minimize the outage period and disruption. In addition, Metropolitan's planning efforts to diversify the water supply and increase overall system flexibility over time have also contributed to providing resilience against potential in-basin earthquakes.

Metropolitan will continue to evaluate its water resource planning programs in terms of how they may further enhance seismic resilience and coordinate these efforts with the Engineering and Operations functions that are described in Sections 4 and 5 of this report.

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1 The latest assessment of potential outage durations for the region's imported water supply aqueducts (Colorado River Aqueduct, the Los Angeles Aqueduct, and the State Water Project East and West branches) following a seismic event developed as part of the 2015 Seismic Resilience Water Supply Task Force between Metropolitan, LADWP, and DWR.

2 https://bda.mwdh2o.com/Board%20Archives/2019/05-May/Letters/064883968.pdf

4 Engineering Component

Metropolitan develops strategies that assess systemwide risks and identify facilities' deficiencies against earthquake hazards. Component-specific mitigation measures are developed and implemented based on established priority. These strategies include evaluating the seismic resilience of structures; systemwide seismic assessments that address multiple facilities and infrastructure components; other specialized efforts that address the seismic resilience of dams and reservoirs and linear components such as tunnels and pipelines; and developing component-specific seismic design criteria.

4.1 Seismic Resilience of Structures

The purpose of evaluating the seismic resilience of structures is to prevent seismic damage to water delivery infrastructure from probable events and to limit damage due to extreme events to minimize water delivery interruptions. For occupied structures, the goal is to protect life safety and critical functions. Metropolitan applies a systematic approach to evaluate existing structures that were constructed in accordance with earlier codes, and where necessary, to upgrade structures with identified seismic deficiencies. The criteria applied to the seismic evaluations incorporate current code provisions and up-to-date industry standards. In general, structures are upgraded to maintain seismic performance levels that are comparable to the levels of a new facility.

A seismic risk-reduction program identifies seismic deficiencies of structures and quantifies the associated risks through an effective evaluation process, enabling limited resources to be allocated strategically to projects that address key vulnerabilities and maximize improvements in the seismic resilience of the water delivery system. A 5-step process aims to achieve the above objectives were developed: 1) a preliminary high-level evaluation to quickly assess structures for potential seismic deficiencies; 2) prioritization of seismically deficient structures; 3) detailed evaluations and development of retrofit options, 4) seismic retrofit implementation, and 5) periodic reevaluation of structures.

Over the past two decades, the prioritization (step 2) was primarily aimed at improving the seismic resilience of above-ground facilities and structures constructed prior to 1990 with emphasis on water delivery facilities and facilities with potential life-safety risks. For example, the Weymouth Water Treatment Plant was placed into service in 1941 and expanded twice to meet growing demand. Weymouth basins 5 through 8 were constructed in 1962 as part of the plant's second expansion. In 2022, Metropolitan's Board authorized rehabilitation of the basins including seismic improvement of the concrete basin inlet channel. These improvements increase

seismic performance of the basin structure (Figure 4-1) and other water treatment equipment such as the baffle walls.



Figure 4-1: Seismic Reinforcement of Weymouth Basin 7

4.1.1 Progress to date

A comprehensive inventory list of Metropolitan's above-ground structures is used to track the progress of the evaluation and seismic upgrades of structures. To date, Metropolitan has completed preliminary evaluations of all 311 pre-1990 above-ground structures (Figure 4-2). Upgrades of many critical structures have also been completed, including the five pumping plants along the Colorado River Aqueduct, the Jensen Administration Building, the Diemer Administration Building, and the Lake Mathews Outlet Tower.

As shown in Figure 4-2, of the 116 structures identified as potentially deficient, 74 have been upgraded and 16 are authorized for study, design, or construction. The remaining 26 structures will proceed through Metropolitan's Capital Investment Plan (CIP) evaluation process to obtain authorization for the detailed evaluations.

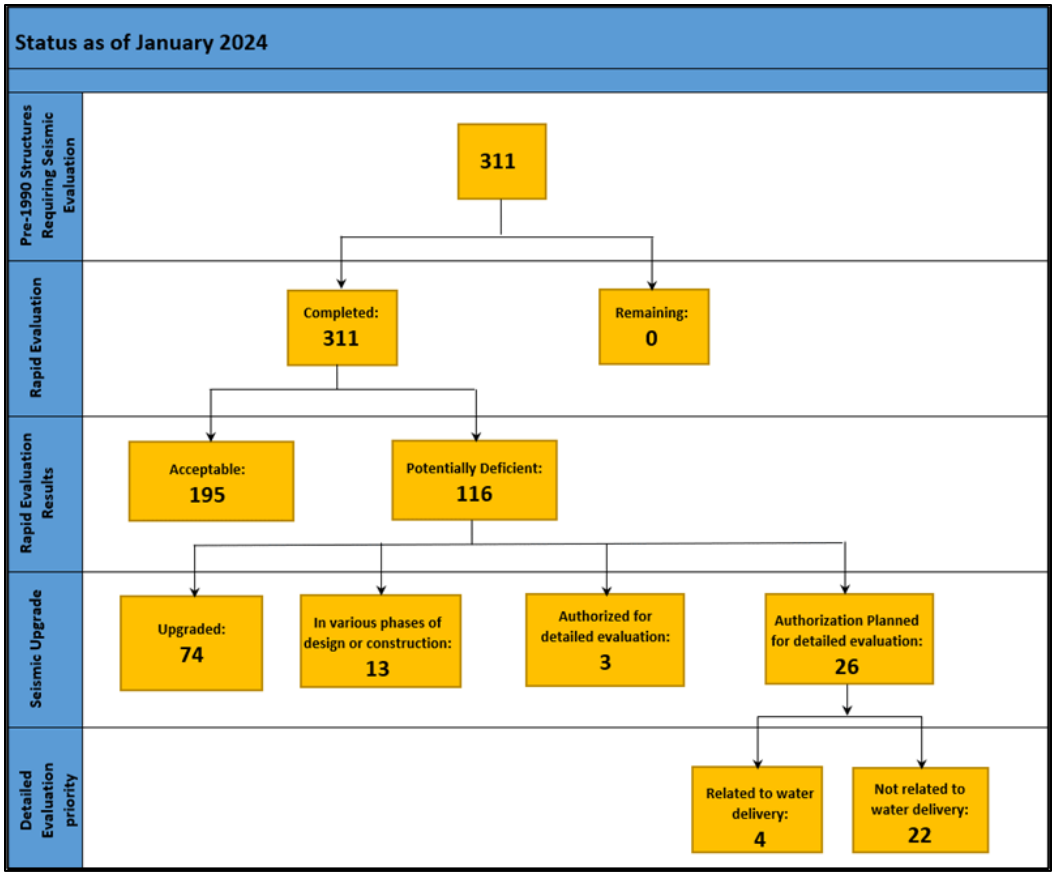


Figure 4-2: Status of Seismic Assessments and Upgrades for Pre-1990 Structures

In 2017, the strategy for achieving the seismic resilience of structures was modified to further enhance the seismic resilience of the delivery system. The refined strategy moved beyond assessing only pre-1990 above-ground structures to include the following:

- Fully and partially buried structures
- Seismic anchorage and bracing of non-structural components such as equipment, pipes, and ducts.
- Structures constructed between 1990 and 2000 (prior to the adoption of UBC 1997)

For the first two items, it was recognized that fully and partially buried structures, while less vulnerable to seismic hazards than above-ground structures, are nevertheless important to maintaining system reliability. Similarly, the seismic resilience of non-structural components, such as equipment and piping, is also important for minimizing operational downtime after a seismic event. To this end, Metropolitan initiated a pilot study to identify potential deficiencies of non-structural components at several facilities across multiple treatment plants. Upon completion of the pilot study, the information gathered will be used to start a comprehensive assessment of non-structural components at all Metropolitan facilities.

The third item, relating to UBC 1997, is included in the expanded effort since seismic design codes have been modified such that some structures designed and constructed after 1990 also warrant an assessment. Recorded ground motions in the 1994 Northridge Earthquake, for example, revealed that the design seismic force specified in building codes at the time was underestimated for sites located close to faults. This near-fault effect was incorporated into the subsequent code (UBC 1997). As a result, certain structures designed between 1990-2000 prior to the adoption of UBC 1997 may be vulnerable to a major earthquake.

Metropolitan has begun the preliminary evaluations of the post-1990 above ground structures (Figure 4-3). As shown in the figure, of the 6 structures identified as potentially deficient, 1 has been upgraded and 1 is authorized for preliminary design. The remaining 4 structures will proceed through Metropolitan's CIP evaluation process to obtain authorization for the detailed evaluations.

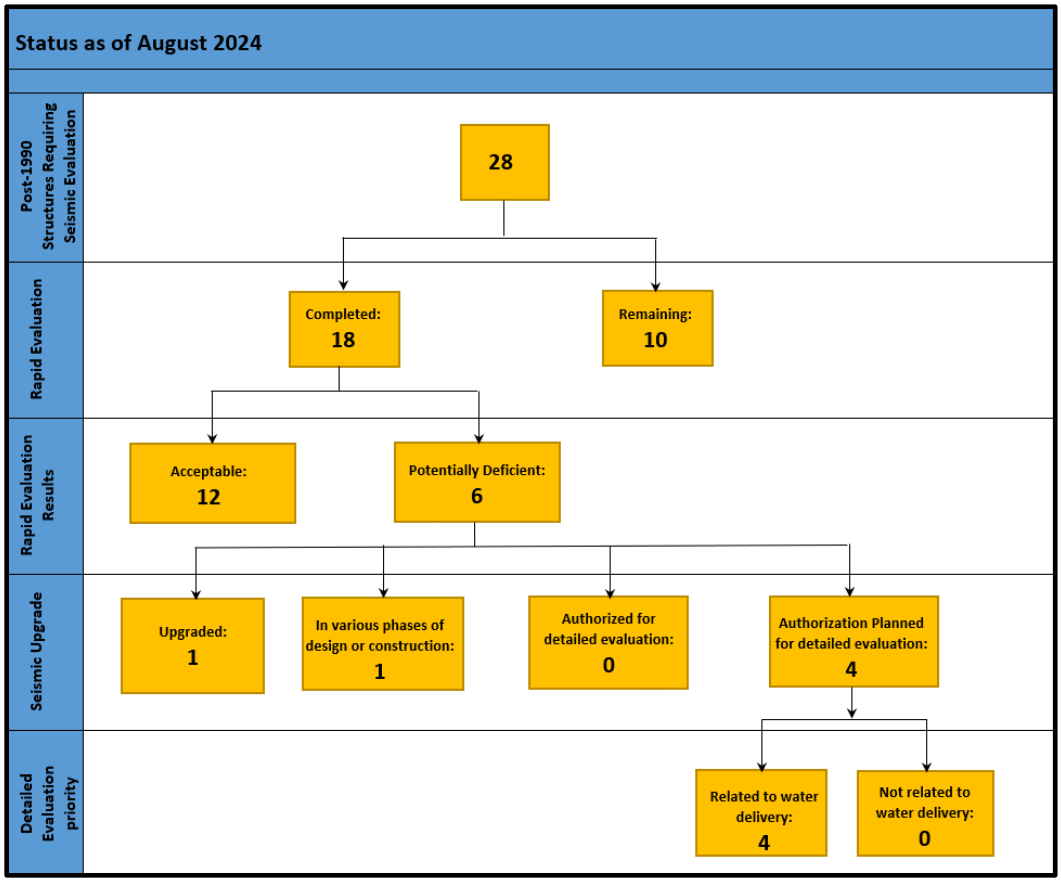


Figure 4-3: Status of Seismic Assessments and Upgrades for Post-1990 Above Ground Structures

Moving forward, the near-term focus is to complete the detailed evaluations and seismic retrofit projects that have been authorized to date. Long-term goals include:

- Continue assessment of seismic design criteria to incorporate updated seismic resilience strategy
- Develop a systematic approach to improve the seismic resilience of non-structural components
- Conduct preliminary evaluations for critical fully or partially buried structures
- Complete the preliminary evaluation of post-1990 above ground structures

4.2 Systemwide Seismic Assessments

Metropolitan conducts studies to further the organization's understanding of the vulnerability of its infrastructure system to seismic hazards. The studies support emergency response training and planning for future earthquake events by estimating the magnitude of damage that may occur from various seismic events. Current studies are described below.

Local Hazard Mitigation Plan – The Local Hazard Mitigation Plan will assess Metropolitan's exposure to natural hazards, including earthquakes, wildfires, landslides, floods, droughts, extreme weather events, and climate change. The plan sets goals for hazard mitigation and identifies studies and projects that will move the organization toward those goals. The plan will require approval by the Federal Emergency Management Agency (FEMA) and adoption by Metropolitan's Board of Directors. Completion of the Local Hazard Mitigation Plan would qualify Metropolitan for federal grant funding programs to offset the costs of hazard mitigation studies and projects.

Pipeline Seismic Vulnerability Assessment – A collaboration with the University of California, Berkeley Center for Smart Infrastructure (CSI), the Pipeline Seismic Vulnerability Assessment evaluates the risk to Metropolitan's pipeline system against the seismic hazard. Whereas previous studies have looked at damage under specific earthquake scenarios, this study will utilize a probabilistic approach to evaluate the impacts on Metropolitan's conveyance and distribution system, considering earthquakes with varying ranges of magnitudes at different faults. This approach provides a more comprehensive understanding of the relative risk, considering uncertainties in estimating hazard level and damage extent, for different pipelines. The findings will inform the prioritization process and result in a more effective mitigation effort. Figure 4-4 shows four potential repair realizations based on a hindcast of the 1994 Northridge Earthquake (M 6.7), as part of the model calibration process. The multiple realizations are a result of modeling the damage probability at each pipe segment using a Poisson distribution. The

parameters of the Poisson distributions are estimated based on pipeline fragility curves and the estimated ground shaking and ground failure intensities from the 1994 Northridge earthquake.

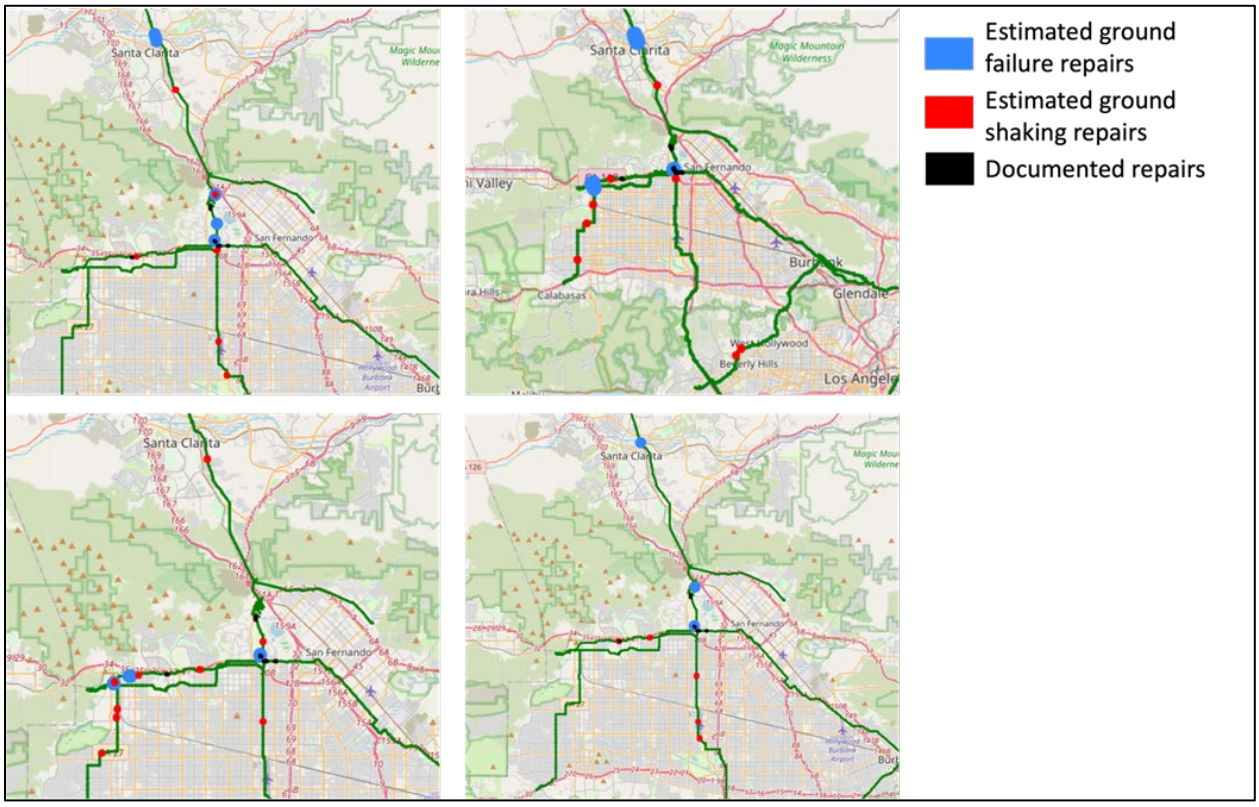


Figure 4-4: Examples of Pipeline Repair Location Realizations from Northridge Hindcast for Pipeline Seismic Vulnerability Assessment

4.3 Dams and Reservoirs Seismic Resilience

The seismic resilience of Metropolitan's dams and reservoirs is safeguarded by a robust and proactive comprehensive dam safety program managed by the Engineering Services Group (ESG). ESG's Safety of Dams and Geotechnical Team performs inspections, interprets, and analyzes collected surveillance and monitoring data, evaluates dam structures and appurtenant works, reports the findings, and serves as Metropolitan's liaison with the California Department of Water Resources, Division of Safety of Dams (DSOD).

Metropolitan owns and operates 20 facilities that are under the jurisdiction of DSOD, and there are a total of 24 individual dams, as some of these facilities have multiple dams. Metropolitan's portfolio of dams includes concrete arch dams, embankment dams, and rectangular reinforced concrete reservoirs or basins.

Several new programs were recently initiated that aim to bolster the seismic resilience of Metropolitan's dams by evaluating seismic risk and identifying risk reduction measures, better monitoring of the dams' performance during and after earthquakes and preparing for emergencies that could result from earthquakes.

4.3.1 Dam Safety Risk Assessments

A program was initiated in 2023 to perform comprehensive risk assessments of Metropolitan's dams which aim to identify potential failure modes (PFM) for the dam systems, and to estimate the risk associated with the PFMs. These comprehensive evaluations are done in accordance with current industry standards and best practices and include all the dam/reservoir system components such as spillways, outlet towers, and other appurtenant structures. The risk of failure as a result of a seismic event is estimated semi-quantitively considering a range of site-specific earthquake scenarios including the more frequent smaller events as well as the less frequent much larger events, and any necessary risk reduction measures are identified. In addition to identifying risk reduction measures, the understanding of seismic risk will inform the periodic updates to the inspection and monitoring procedures for the dams and provide the basis for prioritizing CIP projects.

The first risk assessment was completed for Lake Mathews dams and appurtenant structures in 2024, and the risk assessment for Lake Skinner was completed in 2025. The risk assessments concluded that the risk associated with seismic PFMs at both Lake Mathews and Lake Skinner dams are relatively low, below the action level identified in the federal risk guidelines. No immediate risk reduction measures were deemed necessary. However, further studies including detailed three-dimensional numerical analyses and enhanced post-seismic monitoring and surveillance were recommended.

These assessments are prioritized based on perceived risk at sites, with additional assessments scheduled to be completed by 2028.

4.3.2 Automated Dam Monitoring Systems

Another new initiative to modernize Metropolitan's existing dam monitoring systems began in 2023. The existing monitoring systems at several dams will be upgraded with state-of-the-art automated data acquisition systems (ADAS) that provide the ability to collect, view, and evaluate data on a near real-time basis from many instruments located in and around the dams and appurtenant structures. Data collected from different types of instruments that monitor pore pressures, groundwater levels, seepage flows, ground shaking, and deformation can be reviewed immediately after an earthquake to assess the performance of the dam and appurtenant structures. The upgraded systems also provide easy-access dashboards for data, and notification capabilities when preset thresholds are exceeded.

The monitoring system at Garvey Reservoir was upgraded in 2024. Monitoring system upgrade at Diamond Valley Lake is underway with a planned completion date of June 2025. Additional monitoring system upgrades planned for Lake Mathews and Lake Skinner will utilize the same approach as Garvey Reservoir and Diamond Valley Lake.

Figure 4-5 shows the instrumentation layout at Garvey Reservoir and the earthquake record from the recent 4.4 magnitude Highland Park earthquake, which occurred on August 12, 2024, with an epicenter located approximately 4 miles northwest of the reservoir. The new seismic accelerograph installed on the Garvey Reservoir North Embankment provided useful data immediately after the earthquake, which enabled staff to quickly evaluate the impact of the earthquake on the dam.

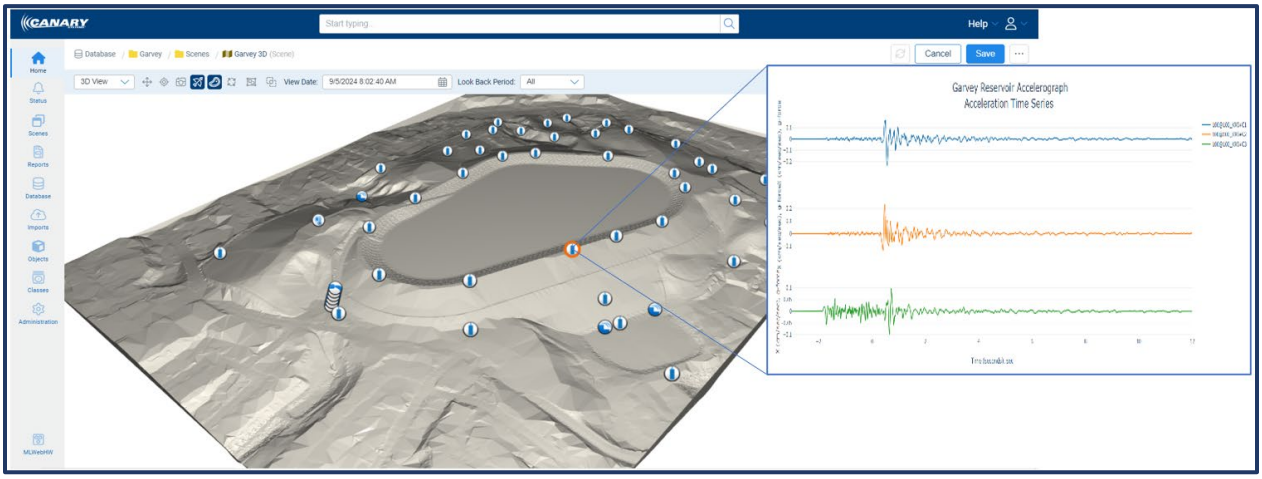


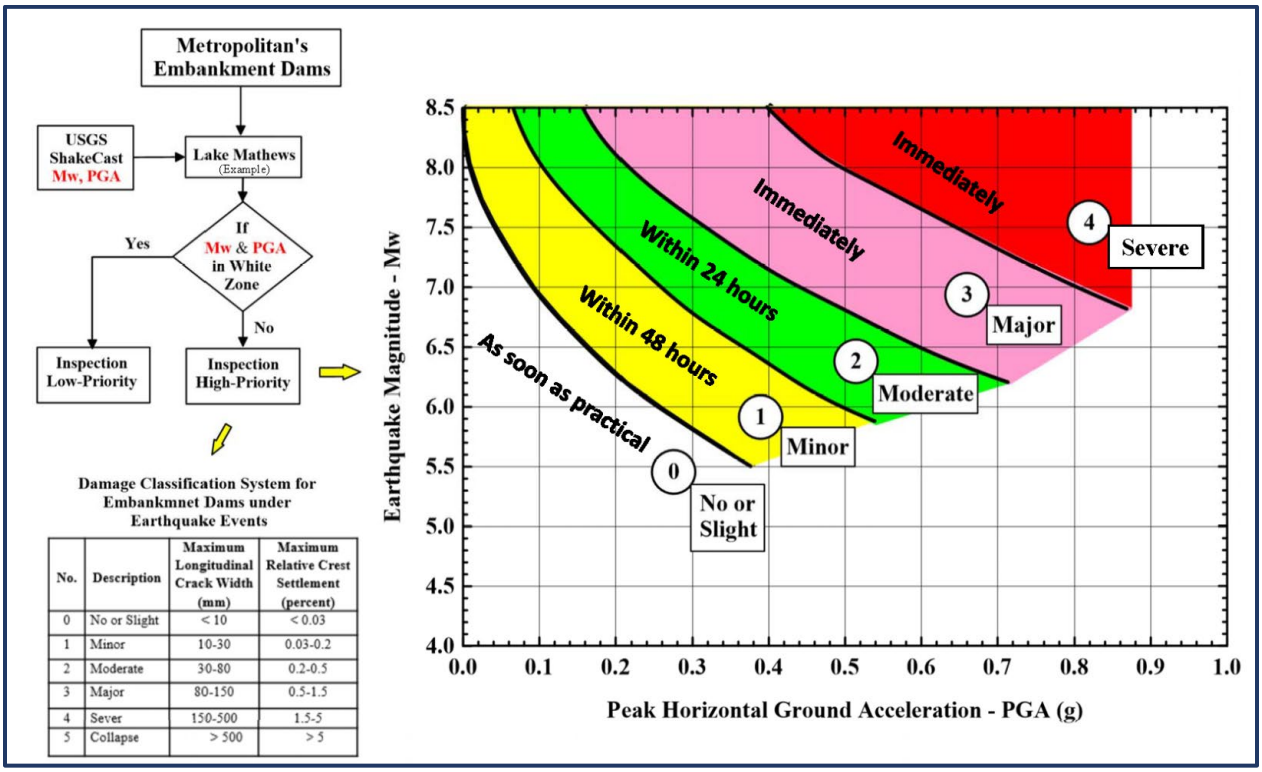
Figure 4-5: Garvey Reservoir Dam Monitoring System Dashboard and Recent Earthquake Data

4.3.3 Emergency Preparedness and Response

State-mandated Dam Emergency Action Plans (EAP) were completed and approved by the California Governor's Office of Emergency Services (Cal OES). A total of 13 EAPs were completed and approved, and several EAP exercises have been conducted with Metropolitan staff. The EAPs identify potential emergency conditions resulting from significant ground shaking during an earthquake and specify actions to be taken during and after the emergency.

In addition to the Dam EAPs, a new procedure was developed to allow the Dam Safety Assessment Team (DSAT), which is part of Metropolitan's Emergency Operations Center (EOC) organization, to prioritize post-earthquake inspections based on the earthquake magnitude and the recorded Peak Ground Acceleration (PGA) at or near the dam location. The purpose of this

procedure is to prioritize post-event inspections on the dam(s) that are likely impacted by the event. The new guideline is shown in Figure 4-6.



No.	Description	Maximum Longitudinal Crack Width (mm)	Maximum Relative Crest Settlement (percent)
0	No or Slight	< 10	< 0.03
1	Minor	10-30	0.03-0.2
2	Moderate	30-80	0.2-0.5
3	Major	80-150	0.5-1.5
4	Sever	150-500	1.5-5
5	Collapse	> 500	> 5

Figure 4-6: Dam Safety Assessment Team – Emergency Response Time Chart

4.4 Pipeline Seismic Resilience

Metropolitan's pipelines have been constructed in conformance with standards and practice at the time of design. Historically, there have been very few prescriptive code requirements for seismic design of pipelines. More recently, there have been developments in evaluation guidelines and mitigation measures for large-diameter pipelines, including improved techniques to analyze the interaction between pipelines and surrounding soil during shaking, increased post-earthquake reconnaissance on water systems, and demonstrated performance of earthquake-resistant pipeline products.

Two types of seismic hazards, ground shaking and permanent ground displacement (PGD), can potentially cause damage to pipelines. PGD could occur at fault crossings, liquefiable zones, and unstable slopes. Metropolitan has conducted and will continue to update seismic vulnerability assessment of its distribution system, which consists of mainly large-diameter pipelines. From historical data and records of Metropolitan's pipeline performance in past earthquakes, large-diameter pipelines are less vulnerable to ground shaking. Damage resulting in severe pipeline leaking was mainly caused by PGD. Therefore, the current focus of Metropolitan's pipeline

seismic resilience strategy is to mitigate vulnerabilities caused by PGD to effectively reduce overall risks with limited resources. In the meantime, Metropolitan will opportunistically address other seismic vulnerabilities when an aging pipeline is slated for rehabilitation.

Metropolitan has adopted seismic design criteria for pipelines to resist various hazards. For new design or rehabilitation of pipelines at fault crossings, Metropolitan will attempt to characterize the fault rupture location, direction, and ground displacement which can be used as the input to simulate the interaction between pipeline structure and surrounding soil. Slope instability hazards are analyzed similarly applying nonlinear finite element models of subgrade structures and soil materials to capture the soil-structure interaction. Mitigation measures could include strengthening pipelines and joints, soil improvements, and application of earthquake-resistant pipelines. Since the extent of liquefaction areas is difficult to define for the purpose of calculating pipeline strain and stress, the approach to address liquefaction hazards is avoidance and restoration. New pipeline installation will avoid potential liquefaction zones. For existing pipes, the resilient strategy, such as isolation, pre-event design, and stockpiling described in a later section, will be most prudent. Pipe joints and thrust are evaluated to resist the shaking hazards.

Examples of some of Metropolitan's ongoing and recently completed pipeline-related seismic projects are provided below.

Casa Loma Siphon No. 1 - The Casa Loma Siphon No. 1 seismic upgrade project was completed in 2024 and put into active service. The project utilized Earthquake Resistant Ductile Iron Pipe (Figure 4-7) to replace approximately 700 feet of the existing siphon with a 104-inch-diameter-double barrel system able to accommodate long-term subsidence and potential rupture of the San Jacinto Fault at the crossing.



Figure 4-7: Earthquake Resistant Ductile Iron Pipe Joint Assembly for Casa Loma Siphon

Prestressed Concrete Cylinder Pipe Rehabilitation - Metropolitan's rehabilitation program of its prestressed concrete cylinder pipelines (PCCP) is progressing as planned. The program will install welded steel liners within the existing PCCP pipeline sections of Metropolitan's conveyance and distribution system. Approximately 18 miles of a planned approximate 29 miles have been relined on Metropolitan's Second Lower Feeder. Reach 9 of the Second Lower Feeder PCCP Rehabilitation crosses the Los Angeles River and the Newport-Inglewood Fault. The feeder is being evaluated for improvements to the proposed steel liner rehabilitation of the PCCP, which will increase the feeder's seismic capacity against potential fault ruptures. Possible improvements include improved joint construction to match the yield strength of the steel liner and modifications of the grout material between the liner to the PCCP to achieve higher performance during a seismic event. Metropolitan is also progressing with the design for the PCCP Rehabilitation Project for the Sepulveda Feeder, which will line approximately 19 miles of pipe.

Sepulveda Canyon Slope Stability - The Sepulveda Canyon Control Facility (SCCF) is an important system and central in controlling the flow and hydraulic operating pressure of the Sepulveda Feeder system. The SCCF is situated in a large tributary canyon, located near the Getty Center and west of the junction of Interstate 405 and Sepulveda Boulevard in Los Angeles.

The facility was originally constructed on level pads created by placing and compacting fill in Sepulveda Canyon. Site work, including placement of this compacted fill, was carried out between 1969 and 1970. Grading for the original site development and canyon-area fill was performed with only partial removal of alluvial soils present in the bottom of a V-shaped canyon. These soils were reportedly removed to just above the groundwater level. The pads were established at elevations designed to maintain sufficient head to control the distribution of water from the facility. Site grading involved constructing an east-facing fill slope in the narrow canyon area that ranges from about 90 to 130 feet in height and is inclined at approximately 1.5:1 to 2:1 (horizontal to vertical).

Major infrastructure at the SCCF consists of large circular tanks, a pressure control structure, hydroelectric power generation, overflow structures, and the Sepulveda Feeder pipeline. Recent field investigations indicated that the facility may suffer liquefaction-induced slope failure in the existing alluvial soils under the most recently updated seismic code. The planned Sepulveda Feeder Pump Stations Project has developed effective measures to stabilize the slope that include soil remediation and a soil retaining system (Figure 4-8). The pipe approaching and leaving the facility will be evaluated to remain in service following a seismic event and slope movement.

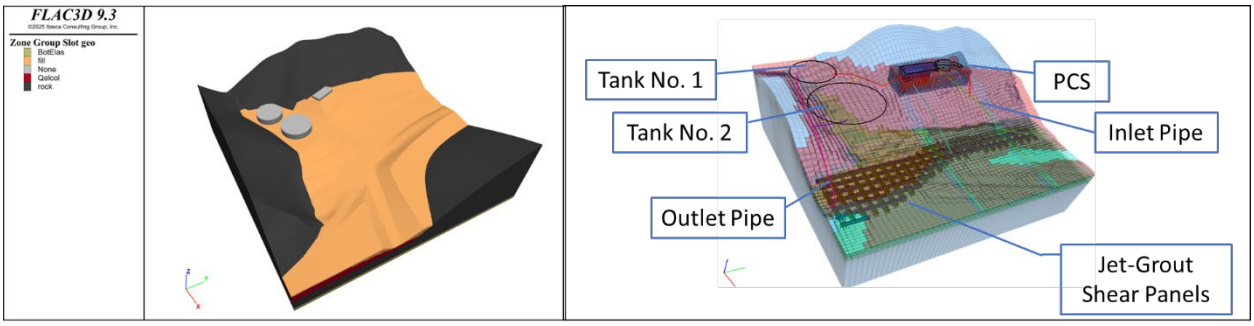


Figure 4-8: FLAC 3D Models of Sepulveda Canyon Site, with left model showing fill area (yellow) and right model showing 3-D mesh of proposed mitigation to stabilize the slope

4.5 Tunnel Seismic Resilience

Metropolitan's main conveyance line, the CRA, and its distribution system traverse through complex topographies that required tunnel construction in some areas. The CRA features approximately 92 miles of tunnels, accounting for 38 percent of the 242-mile aqueduct. The western portion of the CRA is in a seismically active area and crosses several known active faults. The distribution system includes 41 tunnels with a combined total length of 68.9 miles, representing 8.3 percent of the entire system. Similarly, many known active faults in the region also present a significant seismic risk to this part of the system.

The primary hazards associated with seismic events for tunnels include ground shaking, fault rupture, and other ground failures related to the site characteristics such as liquefaction, landslides, and rockfalls. The performance of tunnels during a seismic event also depends on the different tunnel attributes, including construction method, geological conditions, type of liner, and depth of cover. Recent projects for tunnel-related seismic improvements include the Whitewater Tunnel No. 2 and the Iron Mountain Tunnel.

Whitewater Tunnel No. 2 – Whitewater Tunnel No. 2 is part of the Colorado River Aqueduct, which conveys water from the Colorado River into the Metropolitan's service area. The tunnel is located near the Garnet Hills segment of the San Andreas Fault Zone and is crossed by a strand of the Garnett Hills fault. A project to improve the seismic resilience of the tunnel is currently in preliminary design. The project will strengthen the portal sections of the tunnel and improve access to the western portal including road improvements and construction of a new access structure. Since the precise location of the fault crossing is difficult to define, the design of a bypass tunnel is part of the resilient measures to plan for the potential restoration of the damaged tunnel segment regardless of its location. The project is currently nearing completion of preliminary design.

Iron Mountain Tunnel – The Iron Mountain Tunnel is part of the Colorado River Aqueduct, which conveys water from the Colorado River into the Metropolitan's service area. The western end of the tunnel was constructed through old alluvial fan deposits predominantly consisting of slightly to moderately consolidated, boulder, cobble, gravel, sand, and silt deposits. Approximately 2,500 feet of the Iron Mountain Tunnel concrete lining is distressed with a continuous longitudinal crack running near the centerline of the crown. The width of the crack ranges from 1/8-inch up to approximately 2 inches but is more consistently about a ½ inch to 1-inch wide. Metropolitan has performed focused tunnel inspections and has concluded that although the observed tunnel lining distress does not present an immediate threat to structural integrity, it could have the potential to adversely impact the long-term reliability of the CRA system. Iron Mountain Tunnel seismic improvements are focused on strengthening the distressed portion of the tunnel to prevent potential damage from earthquake-induced shaking. The project is currently in the study phase, which will consider different strengthening options.

5 Operations (Emergency Response)

5.1 Emergency Response Training

In addition to training emergency response staff on National Incident Management System procedures, Metropolitan regularly conducts emergency response training exercises which are often based upon a postulated seismic event (Figure 5-1). Exercises can be in the form of table-top exercise, a high-level review of policies and procedures, or a functional exercise, a simulated emergency event.

Recent seismic related exercise examples include:

- "ShakeOut 2024" – Functional exercise located at Metropolitan's Emergency Operations Center with participation from member agencies including the Foothill Municipal Water District, Calleguas Municipal Water District, City of Long Beach Water Department, and Southern California Edison
- "ShakeOut 2022"- Functional exercise located at Metropolitan's EOC with participation from member agencies including the Three Valleys Municipal Water District, Foothill Municipal Water District, Upper San Gabriel Valley Municipal Water District, City of Pasadena, and City of San Marino
- "ShakeOut 2020" – Functional exercise located at Metropolitan's Emergency Operations Center with participation from member agencies including the City of Anaheim, City of Burbank, Eastern Municipal Water District, City of Fullerton, City of Glendale, and Las Virgenes Municipal Water District



Figure 5-1: Metropolitan staff conducting emergency response exercise at the Emergency Operations Center

The Metropolitan EOC also conducts monthly communication tests, which include Metropolitan's emergency two-way radio system, on-line WebEOC system, Met-Alert mass notification system, and satellite phones. These monthly tests reach out to the member agencies, treatment plant control centers, ICPs, Metropolitan management, and the Department of Water Resources. These regular exercises help prepare Metropolitan and its member agencies to respond to future emergencies.

5.2 Emergency Response Capabilities

Metropolitan continues to maintain the necessary staffing, materials, and equipment to respond to two simultaneous pipeline breaks. The Machine Shop and Coating Shop at La Verne are available to fabricate pipe sizes up to 12 feet in diameter, and Metropolitan's construction forces have the necessary equipment and expertise to make the repairs in-house. In May 2022, Metropolitan's Board approved Stage 5 of the La Verne Shops upgrades which included building and utility upgrades, refurbishment of existing equipment, and installation of new equipment (Figure 5-2). This project is expected to be completed in 2025.



Figure 5-2: Installation of new equipment at the La Verne Shops

6 Reporting

The reporting component of Metropolitan's seismic resilience strategy focuses on the following areas:

1. Record Keeping: Tracking progress and maintaining a record of expenditures
2. Annual Updates: Providing annual updates to Metropolitan's Board of Directors
3. Formal Reporting: Preparing a formal Seismic Resilience Report every five years

6.1 Record Keeping

The component involves tracking progress on key seismic activities. Key seismic resilience activities include the planning, engineering, operations, and near-term goals identified in Section 8. Specific activities include:

- Systemwide planning studies related to seismic resilience
- Seismic evaluations of structures, facilities, and components
- Designs for seismically upgrading structures/systems and related construction activities
- Emergency response training exercises
- Update component-specific seismic design criteria and performance objectives
- Joint efforts with external agencies through the Task Force

For each of these activities, progress is tracked and reported at regular intervals.

6.2 Annual Updates

Staff provides updates to Metropolitan's Board of Directors on an annual basis. The annual update focuses on refinements in seismic resilience strategies due to new information on regional seismicity, new technologies, industry standards, and recent seismic events. It also highlights recent accomplishments and recaps progress toward near-term goals.

6.3 Formal Reporting

The report summarizes seismic resilience objectives, goals, and accomplishments; consolidates key reference materials; and provides a high-level summary of the various activities related to seismic resilience throughout Metropolitan. Specific areas of emphasis can include:

- Knowledge Transfer: The formal report will provide a convenient, comprehensive source for seismic resilience information. The report will contain key information for all seismic resilience efforts throughout Metropolitan and will include a list of all formal Metropolitan reports on seismic issues. Individuals can use this information to familiarize

themselves with Metropolitan's seismic resilience history, issues, and goals, which will make them more effective in supporting seismic resilience efforts.

- Accountability: Through annual reporting to the Board, seismic resilience programs will maintain a higher degree of visibility, focus, and momentum on projects and studies that will help Metropolitan meet target goals.
- Transparency: The sharing of seismic resilience studies, projects, and performance objectives will benefit the facility planning efforts of member agencies. Seismic risk, mitigation, and projected duration of outages are complex issues that deserve adequate discussions between Metropolitan and member agencies to facilitate decisions and investments that best serve the public.

This summary report is updated every five years.

7 Seismic Resilient Water Supply Task Force

The Seismic Resilient Water Supply Task Force is a joint effort between Metropolitan, the California Department of Water Resources, and the Los Angeles Department of Water and Power. The task force was formed in 2016 to mitigate impacts and promote a coordinated response in the event of a large-scale earthquake impacting the region's major imported water conveyance systems. The task force meets annually and as needed to review and update goals and objectives (Figure 7-1). Additionally, the task force conducts joint emergency response exercises.

7.1 Joint Emergency Response Plan and Exercises

A Joint Agency Emergency Response Plan was developed, which describes a strategy for responding to emergencies caused by natural disasters or other unavoidable circumstances that would significantly damage the three largest aqueducts that bring water to the Southern California. The three aqueducts are the State Water Project's California Aqueduct (CA), which is owned and operated by the State of California's Department of Water Resources (DWR); the Los Angeles Aqueduct (LAA), which is owned and operated by the City of Los Angeles Department of Water and Power (LADWP); and the Colorado River Aqueduct (CRA), which is owned and operated by The Metropolitan Water District of Southern California (Metropolitan). DWR, LADWP and Metropolitan are the focus of this plan because the overlap of service area of the three agencies allows for a unique opportunity to coordinate emergency repairs following a catastrophic event that disrupts the imported water supply to the region. As such, the focus of the plan is the response to emergencies on the imported conveyance systems.



Figure 7-1: Seismic Resilient Water Supply Task Force Emergency Planning Exercise in March 2025

The plan will be updated every three years by representatives from each agency's emergency management departments. The updated plan will be reviewed and approved by System Operations or a higher-level manager.

The plan is exercised every two years, at a minimum, and follows the exercise processes set forth by the United States Department of Homeland Security. An Exercise After-Action Report and Improvement Plan will be created after each exercise and presented to the managers of each agency for review.

8 State Water Project Seismic Resilience

DWR continues to enhance the seismic resilience of the State Water Project (SWP) through a multi-pronged approach of re-evaluating SWP infrastructure with current seismic loading parameters, design and construction of seismic improvements, emergency preparedness, and research. Within the last three years, DWR's Division of Engineering Geotechnical Services Branch has fully implemented the SWP Seismic Program (SWP-SP). The objective of the SWP-SP is to identify and evaluate the overall seismic risk to the SWP and to establish priorities for seismic studies, risk reduction, and mitigation. Multiple projects are currently underway.

Re-Evaluations

- Between 2019 and 2024, DWR conducted advanced non-linear finite element analyses of the Oroville Dam Flood Control Outlet Monoliths 25 and 26 (the gated monoliths). The radial gates and the roadway bridge were also reanalyzed. Retrofit projects have been included in future planning as DWR awaits technical feedback from regulatory agencies.
- DWR completed screening-level structural analyses of "hard structures" at Pyramid and Cedar Springs Dams. More advanced analyses were also conducted for the Pyramid Dam outlet tower, which was identified as the most "seismically vulnerable" of the structures.
- DWR completed re-analysis of the left abutment of Castaic Dam considering current seismic loading conditions and potential future groundwater conditions.
- DWR completed the *Hyatt Powerplant Seismic Walkdown*. Phase 1 of the effort included a high-level assessment of plant equipment and systems for criticality and vulnerability to seismic shaking. Phase 2, completed in 2023, consisted of structural calculations of key equipment to determine the need for seismic retrofits. The on-going Phase 3 consists of design and construction of retrofits which largely consist of adding anchor bolts, strapping, or other means of preventing overturning or sliding failure during the design level seismic event.
- Phase 1 seismic walkdowns were also performed for Pearblossom Pumping Plant and Devil Canyon Powerplant.

Design and Construction

- In 2022, DWR completed the *Perris Dam Seismic Remediation* project which included deep soil-cement mixing to improve the dam's foundation and construction of a large berm to improve its stability and reduce deformations in association with extreme seismic events.

- In 2023, DWR completed the *Castaic Dam Tower Bridge Seismic Retrofit* which required a temporary drawdown of the lake to allow for installation of carbon-fiber reinforced polymer wrap on the bridge's piers (Figure 8-1).
- DWR continued to engage with the US Bureau of Reclamation on the BF Sisk Dam *(San Luis Reservoir) Safety of Dams* project that will address seismic deficiencies for multiple segments of the dam. The first construction contract was issued in April of 2022 and anticipated to complete in late 2025.
- DWR is currently evaluating 42 seismically vulnerable bridges on the California Aqueduct in the San Joaquin Field Division and designing retrofit measures to be implemented by late 2027.
- DWR is currently designing modifications to the Castaic Dam Intake Tower and Outlet Works to prevent damage to critical components and allow drawdown of the reservoir following a major earthquake. Construction is scheduled to be complete in late 2027.
- DWR is currently evaluating alternatives to minimize the risk of failure and improve post-seismic operation of the existing headworks and radial gate on the main spillway at Pyramid Dam. Construction is anticipated in the 2028 – 2030 timeframe.



Figure 8-1: Castaic Dam High Tower and Access Bridge, with scaffolding installed for installation of carbon-fiber reinforced polymer wrap on piers

Emergency Preparedness

- DWR prepared or updated inundation maps for nearly all its dams for inclusion in Emergency Actions Plans (EAPs) for SWP dams. DWR also updated and submitted all its dam EAPs, with DSOD-approved inundation maps, to CalOES.

- In 2022, DWR established the Emergency Preparedness Program (EPP) to drive continuous improvement of the SWP's response and recovery capabilities.
- In 2022, the SWP EPP modernized post-earthquake response plans and procedures that provide for a scaled response commensurate with the magnitude and geographic expanse of damage that might be experienced.
- On an annual basis, DWR conducts annual Emergency Action Plan seminars and conducts communication drills for its dams.
- The creation of the SWP Emergency Preparedness Program (EPP) has led to increase in exercises. Prior to the SWP EPP, typically just one tabletop or functional exercise occurred each year. DWR is now averaging three tabletop and two functional EAP exercises per year.
- Field Divisions instituted duty monitoring and/or implemented their EAPs for the following events:
    - 2022 – North Complex Fire near Oroville Dam
    - 2022 – Tropical Storm "Kay" for Southern FD
    - 2022 – Route Fire near Castaic Dam
    - 2021 and 2023 – High Flow Operations at Del Valle Dam, DFD
    - 2023 – Devils Den Pumping Plant Fire, San Luis FD
    - 2023 – January Winter Storms
    - 2024 – Post Fire, near Pyramid and Castaic Dams, SFD
    - 2024 – Thompson Fire, near Oroville Dam (Figure 8-2)



Figure 8-2: 2024 Thompson Fire burning along the rim of Lake Oroville (photo courtesy of CalFire)

Seismic Hazard Characterization

DWR commonly partners with leading consultants and researchers to ensure the best available information is utilized to design and re-evaluate SWP assets. DWR's efforts in the fields of faulting and seismicity, in particular, have been significant in advancing the state of practice and characterization of seismic hazards in California. Examples of the efforts undertaken over the past five years include:

- Investigation of the Grizzly Valley fault near Grizzly Valley Dam, including fault trench excavation
- Investigation of the Indian Creek fault near Antelope Dam, including detailed field mapping in preparation of fault trench excavation
- Investigation of the West Tracy fault at Clifton Court Forebay, including seismic reflection imaging
- Investigation of the Midway fault near Bethany Dam, including detailed field mapping in preparation of fault trench excavation
- Investigation of the Right Abutment faults at Del Valle Dam, including subsurface investigation and fault trench excavation
- Evaluation of most recent fault slip on the "Palomas Segment" of the San Gabriel fault in proximity to Pyramid Dam and Castaic Dam (Figure 8-3)
- Investigation of the Waterman Canyon fault at the Devil Canyon Power Development, including detailed field mapping in preparation of fault trench excavation
- Down-hole and surface shear wave velocity data collection at several dams to support development of current earthquake ground motion estimates
- Site-specific seismic hazard analyses, including deterministic and probabilistic analyses, utilizing the latest fault parameters and attenuation relationships, to better characterize and understand the likelihood of strong ground motions at SWP dams

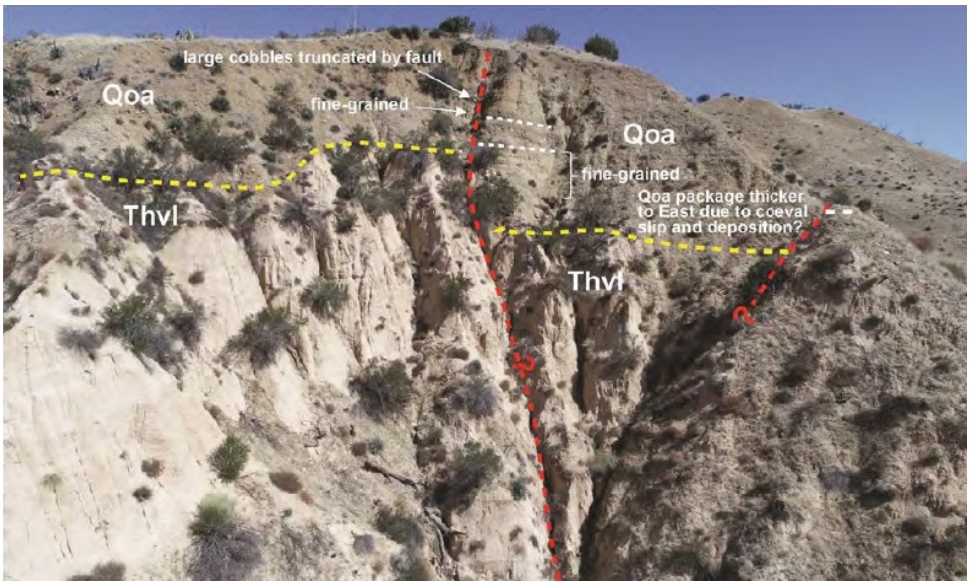


Figure 8-3*:* Drone Image of San Gabriel Fault (Palomas Segment) fault strand displacing base of Older Alluvium (Qoa) deposit (yellow dashed line)

9 Proposed Seismic Resilience Goals

9.1 Status of 2020 Listed Goals

The 2020 Seismic Resilience Report identified near-term goals to further Metropolitan's seismic resilience objectives. The near-term goals are listed below along with an update of the work done to date.

9.1.1 System Level Goals

Goal	**Conduct Special Seismic Studies**
• Update 2006 System Reliability Study, which analyzed the impacts of various single outage scenarios on Metropolitan's ability to meet member agency demand	
Outcome: An update of the study is planned to begin in 2025. The study update will assess the flexibility of the system to withstand a 7-day outage and an extended outage. Flexibility analysis will consider member agency ability to move water from different service connections within their systems, availability of local supplies, and member agency interconnections.	

Goal	**Conduct Planning Studies**
• Complete the 2020 IRP and comprehensive distribution system study under collaborative regional process. Update the emergency storage objective based on new IRP goals and forecasts.	
Outcome: 2020 IRP was finalized and approved by the Board in 2022.	

9.1.2 Facility Level Goals

Goal	**Complete Construction of Approved Projects**
• Weymouth West Wash Water Tank Seismic Upgrade • Union Station Headquarters Building Seismic Upgrade • Diemer West Filter Seismic Upgrade • CRA Casa Loma Siphon Barrel No. 1 Replacement	
Outcome: All four projects have been completed	

Goal	Complete Design of Approved Seismic Upgrade Projects
• Weymouth Administration Building Seismic Upgrade and Building Improvements (Administration and Control Buildings): the final design of both facilities is ongoing • La Verne Water Quality Lab and Field Engineering Building Seismic Upgrades and Building Improvements: preliminary design of the WQ Lab is ongoing while the preliminary design of a new Field Engineering Building has been scheduled • Lake Mathews Disaster Recovery Facility Seismic Upgrades: construction of the seismic upgrade has been completed • Upper Feeder San Gabriel Tower Seismic Upgrade: a detailed seismic assessment revealed that the tower can withstand the design earthquake • Weymouth Inlet Channel Structural Upgrades: construction of the seismic upgrade is ongoing along with the upgrade of Weymouth Basins 5-8. • Foothill HEP Seismic Upgrade: construction of seismic upgrade has been completed • Diemer WWRP No. 2 Seismic Upgrade and Slope Stability Mitigation: preliminary design is ongoing • Sepulveda Canyon Control Facility: final design for the seismic mitigation of the existing tanks and slope stabilization is ongoing	
Outcome: The current status for each project is provided in the box above	

Goal	Seismic Upgrade of Below-Ground Structures
• Initiate evaluation of below-ground structures. Identify and list all structures. Develop a prioritization system for evaluation.	
Outcome: Completed inventory of structures. Visual assessments of structures within Orange, Riverside, San Bernardino, and Los Angeles Counties have been completed. Staff has developed a program for linking the inspection findings to Metropolitan's GIS database for future reference. The results of the visual inspections will be used to identify and prioritize needed repairs.	

9.1.3 Task Force Goals

Goal	Emergency Response Plan and Exercises
• Conduct annual exercises to ensure familiarity with Joint Agency Emergency Response Plan • Semi-annual verification of emergency contact list for DWR, Metropolitan, and LADWP	
Outcome: Partners have held multiple exercises and continue to update the contact list during regular Task Force meetings.	

9.2 Proposed 2025 Seismic Goals

9.2.1 System Level Goals

Goal	Conduct Special Seismic Studies
• Complete Pipeline Seismic Vulnerability Study in partnership with CSI	

Goal	Conduct Planning Studies
• Conduct System Flexibility Study • Review Emergency Storage Criteria	

9.2.2 Facility Level Goals

Goal	Seismic Upgrade of Facilities
• Complete construction of Weymouth Administration Building Seismic Upgrade and Building Improvements (Administration and Control Buildings) • Complete construction of Weymouth Basin 5-8 Seismic Upgrade • Complete seismic upgrade design of La Verne Water Quality Lab • Complete seismic upgrade design of La Verne Storage Building • Complete seismic upgrade design of La Verne Engineering Building • Continue with seismic evaluation of non-structural components • Complete the rapid seismic evaluation of Post-1990 Structure Assessment	

Goal	Pipeline and Tunnel
• Complete design of Whitewater Tunnel No. 2 Seismic Upgrades • Complete studies for seismic mitigation of the Iron Mountain Tunnel • Evaluate seismic risk of the Eagle Mountain siphons • Evaluate seismic mitigation of the Newport Inglewood fault crossing for the Second Lower Feeder Reach 9	

Goal	Dams and Reservoirs
• Complete Garvey Reservoir Outlet Tower seismic rehabilitation • Complete seismic evaluation of Lake Skinner Outlet Tower • Continue with dam monitoring system upgrades • Continue with periodic dam safety assessments	

Goal	Seismic Upgrade of Below-Ground Structures
• Perform initial seismic risk screening and prioritize the list of below-ground structures for seismic evaluation	

9.2.3 Task Force Goals

Goal	Emergency Response Plan and Exercises
• Conduct annual exercises to ensure familiarity with the Joint Agency Emergency Response Plan • Semi-annual verification of emergency contact list for DWR, Metropolitan, and LADWP	

Appendix 9

METROPOLITAN'S ENERGY INTENSITY INFORMATION INCLUDING CONVEYANCE AND DISTRIBUTION GENERATION

Appendix 9
METROPOLITAN'S ENERGY INTENSITY INFORMATION

Introduction

The Metropolitan Water District of Southern California is a wholesale water agency that distributes water to its 26 member agencies. These agencies receive treated and untreated water through Metropolitan's 830 miles of interconnected pipelines. Metropolitan has approximately 400 service connections that deliver water to the 26 member agencies located throughout Metropolitan's 5,200 square mile service area.

Metropolitan has always recognized the relationship between water and energy. In addition to being one of the original contractors for power from Hoover Dam in 1937, Metropolitan also paid for half of the cost of the Parker Dam power plant. The energy Metropolitan receives from these facilities provides greenhouse gas (GHG)-free electricity for pumping along the Colorado River Aqueduct. Metropolitan's conveyance and distribution system is also designed to minimize pumping. Imported supplies flow by gravity through Metropolitan's treatment plants and distribution system to the member agencies.

Water-Related Energy Use in California

The Water-Energy Nexus recognizes that water supplies and energy supplies are interrelated. Water supplies require energy for heating and cooling, but also for transporting, treating and disposing. Likewise, energy supplies require water for cooling, fuel extraction and processing and hydropower production.

State agencies, water districts, and other stakeholders began to study the important link between energy and water in the 2000s. Since then, it has been widely reported that California's "Water Sector" uses 19 percent of the state's electricity and 32 percent of the state's natural gas not used for power generation.

The original source for these statistics is the California Energy Commission's 2005 "California's Water – Energy Relationship" report (CEC-700-2005-011-SF, Nov. 2005). In the report, the CEC analyzed energy use data for 2001 and disaggregated the 19 percent into urban water supply, wastewater treatment, customer end uses, and agriculture. Based on the CEC's analysis, approximately 3 percent of California's electrical use in 2001 was associated with urban water agency conveyance, treatment, and distribution. Customer end-uses such as the heating and cooling of water represented 11.1 percent. Another 0.8 percent was attributed to wastewater treatment and 4.2 percent was associated with agricultural uses. Table A.9-1 presents the water-related energy use in California adapted from the 2005 CEC report.

The 3.8 percent of electricity associated with urban water supply and wastewater treatment represent the "embedded energy" in water.

Table A.9-1
Water-Related Energy Use in California[1]

	Electricity (Gigawatt-hour)	Natural Gas (Million Therms)
Urban Water Supply	**7,554**	**19**
Wastewater Treatment	2,012	27
Urban End Users	27,887	4,220
Agricultural Total	10,560	18
Total Water Sector Use	**48,013**	**4,284**
Total California Use	**250,494**	**13,571**
Urban Water Supply	**3.0%**	**0.1%**
Wastewater Treatment	0.8%	0.2%
Urban End Users	11.1%	31.1%
Agricultural Total	4.2%	0.1%
Total Water Sector Use	**19.2%**	**31.6%**

In 2010, the California Public Utilities Commission reevaluated water-related energy use and estimated that 7.7 percent of the state's electricity was used for urban water supply, wastewater treatment, and agricultural-related pumping and treatment.[2] This is close to the CEC report estimate for those three sectors. In response to California's GHG emission goals, Metropolitan and many other water utilities are taking steps to reduce water-related energy use and emissions. This includes increasing energy recovery in conveyance and distribution systems, developing renewable energy projects, performing energy studies, auditing facility energy usage, and other related actions. Additionally, the conservation programs administered by Metropolitan and the member agencies save embedded energy along with the energy associated with customer end uses. Section 3.8 contains a description of Metropolitan's energy sustainability initiatives and Climate Action Plan.

Metropolitan's Energy Intensity

Under CWC 10631.2(a), urban water management plans "Shall include any of the following information that the urban water supplier can readily obtain:"

1. An estimate of the amount of energy used to extract or divert water supplies.
2. An estimate of the amount of energy used to convey water supplies to the water treatment plants or distribution systems.
3. An estimate of the amount of energy used to treat water supplies.

[1] "California's Water – Energy Relationship" report (CEC-700-2005-011-SF, 2005)
[2] Embedded Energy in Water Studies Study 1: Statewide and Regional Water-Energy Relationship (Public Utilities Commission, 2010, page 58)

4. An estimate of the amount of energy used to distribute water supplies through its distribution systems.
5. An estimate of the amount of energy used for treated water supplies in comparison to the amount used for nontreated water supplies.
6. An estimate of the amount of energy used to place water into or withdraw from storage.
7. Any other energy-related information the urban water supplier deems appropriate.

This section provides Metropolitan's energy intensity information according to these guidelines. Due to the mixing of water supplies before and after treatment, Metropolitan's complex distribution system, and the large number of service connections, Metropolitan provides system-wide energy intensity values. As operational conditions change from month to month and year to year, Metropolitan's energy use and energy intensity also vary.

Metropolitan's operational control includes the Colorado River Aqueduct (CRA) but does not include the State Water Project (SWP). However, excluding upstream embedded energy from the SWP would not represent an accurate estimate of the energy embedded in Metropolitan's water supplies. To avoid potential misinterpretation of the data provided, this Appendix reports Metropolitan's energy intensity information with upstream SWP embedded energy.

Metropolitan's energy intensity for the water it provides to its member agencies is broken down into the following functions and described below:

- Source
- Conveyance
- Treatment
- Distribution
- Storage

Source

The water Metropolitan receives comes from two sources: (1) the California Department of Water Resources' (DWR) State Water Project, and (2) the Colorado River. The energy required to extract or divert water from these sources is reported in conveyance.

Conveyance

The energy requirements from the two conveyance systems supplying Metropolitan's water have been combined, along with the volume of water delivered, into a single weighted energy intensity value. This method provides an energy intensity estimate which can then be used by other water agencies and stakeholders. As the blend of water from the SWP and the Colorado River changes each year, the total energy consumption for conveyance also varies.

Metropolitan's energy intensity for conveyance also accounts for consequential and non-consequential hydropower. Consequential hydropower is hydropower produced as the sole result of a water demand or use. Non-consequential hydropower is hydropower produced

as the result of some combination of water demand deliveries and releases for other purposes such as flood control. The non-consequential hydropower from Hoover Dam and the SWP's Hyatt-Thermalito Complex are discussed in the following sections.

Colorado River

Metropolitan conveys water from the Colorado River through its Colorado River Aqueduct (CRA). The water is pumped through five pumping plants to reach Metropolitan's service area. The nominal energy intensity of water conveyed through the CRA is 2,000 kWh/AF.

There are no recovery-generating plants along the CRA. However, the water that Metropolitan pumps from the Colorado River has been released from Lake Mead through the Hoover Dam generators. Metropolitan receives 27.1 percent of the energy produced at Hoover. This energy is used to power the CRA pumps. The production rate (kWh/AF) at Hoover depends on several factors, including the elevation of Lake Mead. The United States Bureau of Reclamation (USBR) updates this value monthly. Metropolitan incorporates its share of the energy produced at Hoover in the calculation of the CRA conveyance energy requirement.

State Water Project

Metropolitan is a contractor for water from DWR's SWP. The SWP uses a combination of natural and man-made systems to move water from Lake Oroville on the Feather River in northern California, through the Sacramento/San Joaquin River Delta (Delta), and into the California Aqueduct for delivery to Southern California and other regions. DWR conveys water through the California Aqueduct using a series of pumps and hydroelectric generators. Metropolitan receives water from DWR through the West Branch of the California Aqueduct at Castaic Lake and from the East Branch of the California Aqueduct at several locations in San Bernardino and Riverside counties. Historically, the California Aqueduct's net energy intensity for the water received from the West Branch is 2,580 kWh/AF and for the East Branch it is 3,236 kWh/AF. These values are the nominal pumping requirements of the SWP pumps (Banks, Dos Amigos, Buena Vista, Teerink, Chrisman, Edmonston, Oso, and Pearblossom) less the nominal generation values from the West and East Branch recovery generating plants (Warne, Castaic, Alamo, Mojave, and Devil Canyon). These values exclude pumping and generating at the San Luis Gianelli Plant.

The SWP also produces power at its Hyatt-Thermalito complex (HTC) near Lake Oroville and the Feather River in northern California. DWR releases water from the Oroville Reservoir which flows through the HTC hydro generators and produces power for the SWP.

With regard to the relative energy requirements of the SWP, the energy intensity values of SWP deliveries to Metropolitan represent the amount of energy required to move an acre-foot of water from its origin and extract and convey it to Metropolitan's service area. In order to account for geography and water source, DWR subdivides the State into specific geographical study areas for planning purposes, corresponding to the state's major drainage basins. DWR's energy intensity calculations do not include electricity generated at the Oroville Reservoir complex. Table A.9-2 presents the 2023 conveyance energy intensity with upstream SWP embedded energy.

Table A.9-2
2023 Conveyance Energy Intensity with Upstream SWP Embedded Energy

	With SWP Embedded Energy
Total Energy Use (kWh)	4,972,163,024
Water Conveyed (AF)	1,777,818
Energy Intensity (kWh/AF)	2,796.8

Treatment

Metropolitan operates five treatment plants to provide potable water to its member agencies. The estimated amount of energy used to treat water supplies has been calculated by dividing the annual amount of energy consumed at the plant sites by the amount of water treated. In order to meet water quality regulations, Metropolitan has retrofitted its treatment plants to use ozone, rather than chlorine, as the primary disinfectant during treatment (chlorine and ammonia are added after filtration for a disinfection residual in the distribution system). Metropolitan generates ozone on-site at each treatment plant. The ozone generation process has increased the energy required for treating Metropolitan's supplies. Table A.9-3 presents the treatment energy intensity for 2023.

Table A.9-3
2023 Treatment Energy Intensity

	2023
Energy Use (kWh)	56,191,783
Water Treated (AF)	748,025
Energy Intensity (kWh/AF)	75.1

Metropolitan has also installed solar energy at three of its treatment plants with a combined capacity of five megawatts. The electricity generated by these facilities meets between 15 percent and 20 percent of the energy demands of those plants. Solar energy is added to the grid power used at each plant to estimate a total energy intensity value. In 2023, Metropolitan generated 8,436,206 kWh of solar energy from these facilities, reducing the electricity purchased from the grid and its associated GHG emissions.

Distribution

Due to the high elevations at which Metropolitan receives water from the SWP and CRA conveyance facilities, minimal pumping (and electricity use) is needed to distribute treated and untreated water to its member agencies. Gravity, not electricity, drives water supply deliveries through most of Metropolitan's distribution system.

In addition, Metropolitan has 16 recovery hydroelectric generating plants located throughout its distribution system. The generators produce electricity from the water flowing

through the pipelines. These plants generate more power than is consumed from distribution pumping. Without the hydroelectric generators, embedded energy in the water would be reduced at facilities called pressure control structures, and the potential for energy production would be lost. The energy used in the pumping plants and produced by the generators has been netted, with the result divided by water deliveries to calculate the distribution energy intensity.

Weather variation has a significant impact on distribution system energy intensity. In dry years with low SWP deliveries, Metropolitan generates less distribution system hydropower and may need to increase pumping to deliver CRA supplies throughout the region. Table A.9-4 presents the distribution system net energy intensity for 2023.

Table A.9-4
2023 Distribution System Net Energy Intensity

	2023
Pumping (kWh)	5,578,593
Hydropower Generation (kWh)	-109,003,954
Net Distribution Energy Use (kWh)	-103,425,361
Water Delivered (AF)	1,180,000
Energy Intensity (kWh/AF)	-87.6

Storage

Metropolitan maintains significant storage facilities and programs both inside and outside its service area. However, Metropolitan does not use any energy for storage programs under its “span of control.” Water is delivered by gravity flow. External water storage and recovery are managed by other parties and are often transacted through exchange arrangements. Water delivered to Metropolitan from these storage programs is accounted for in conveyance energy intensity.

Metropolitan’s Annual Energy and Energy Intensity

Energy and energy intensity information is provided for each of the non-zero processes listed above: Conveyance, Treatment, and Distribution. As noted previously, these values vary from year to year due to operational changes and differences in water supply availability. An estimated overall energy intensity is provided for untreated and treated water deliveries for 2023 in the table below, accounting for non-consequential hydropower.

Table A.9-5
2023 Treated and Untreated Water Energy Intensity

	With SWP (kWh/AF)
Conveyance*	2,796.8
Treatment	75.1
Distribution	-87.6
Total Treated	2,784.3
Total Untreated	2,709.1

*Uses Metropolitan's upstream embedded SWP energy requirements from DWR's Energy Intensity Tool.
Source: State Water Project Energy Intensity of Water Supplies - Interactive Map. CA Department of Water Resources. Accessed 10/11/2022.

Greenhouse Gas Emissions

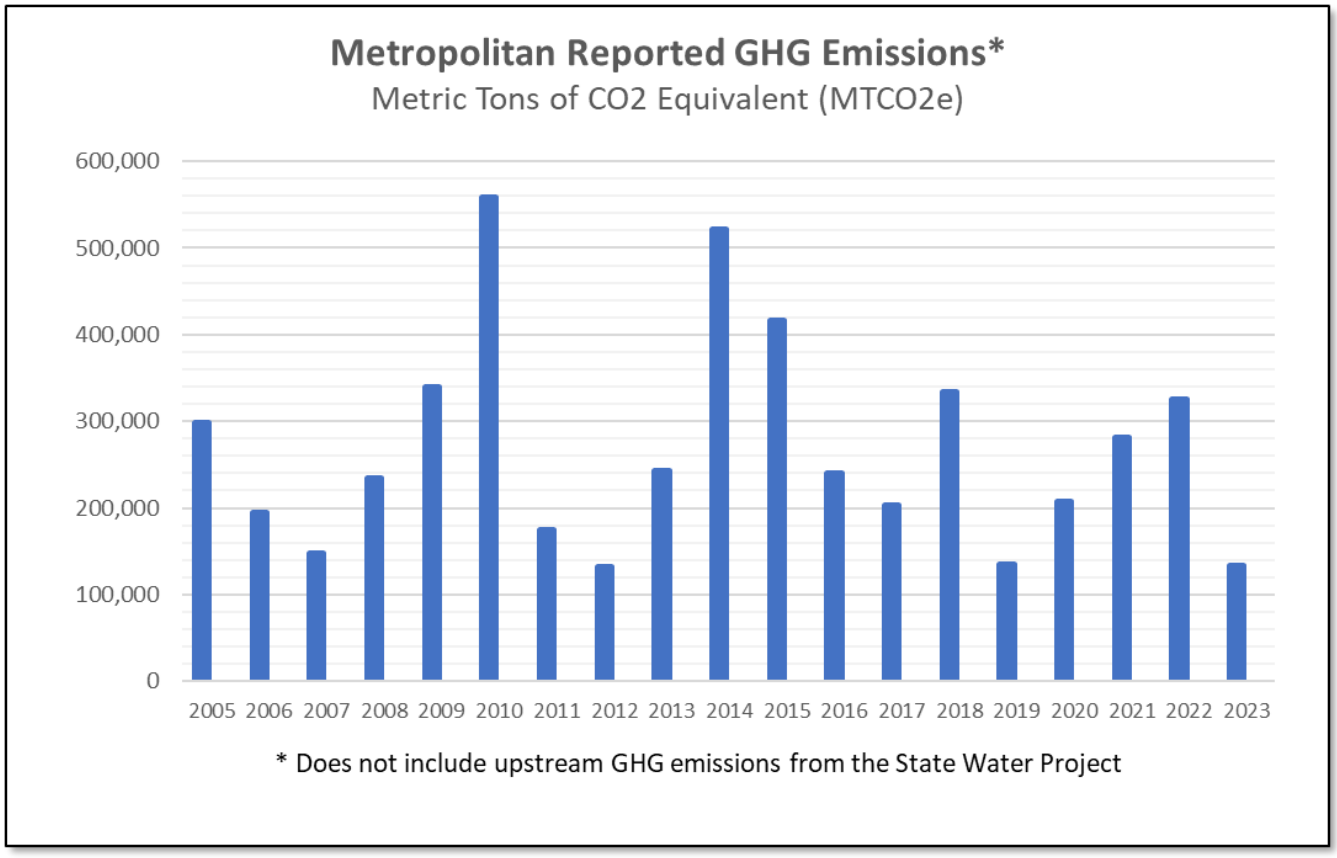
Metropolitan voluntarily reports its GHG emissions from all sources to The Climate Registry (TCR). TCR implements a GHG registry for California entities and develops protocols for GHG reporting. The data provided in TCR's registry is publicly accessible and transparent. Metropolitan's annual GHG data and those for many other water agencies are available through TCR's Climate Registry Information System (CRIS) website. To guarantee data quality, TCR requires published GHG information to be audited by a certified verification expert. Metropolitan has been auditing and reporting its annual GHG emissions to TCR since 2005.

As with energy intensity, Metropolitan's GHG emissions vary due to hydrology. Over 95 percent of Metropolitan's GHG emissions are derived from electricity use, primarily from the CRA. In dry years, Metropolitan purchases additional grid electricity to accommodate higher CRA deliveries and uses more energy for distribution system pumping. The combination of higher electricity use coupled with higher GHG emission factors for purchased electricity cause Metropolitan's GHG emissions to spike in dry years. The opposite is true in wet years. Lower CRA deliveries are met with zero-carbon electricity from Hoover and Parker dams.

Unlike Metropolitan's embedded energy described above, Metropolitan's reported GHG emissions do not include upstream SWP emissions.

Information on Metropolitan's GHG emissions and Climate Action Plan are contained in Section 3.8. Figure A.9-1 presents Metropolitan GHG emissions for 2005 through 2023.

Figure A.9-1
Metropolitan GHG emissions



DWR Required Water-Energy Nexus Table: Process Approach

Table A.9-6 contains Metropolitan's required Water-Energy Table for calendar year 2023 using the Water Supply Process Approach in Table O-1A.

The table shows Metropolitan's energy intensity with upstream SWP embedded energy and non-consequential generation included.

Note that Metropolitan uses an alternative approach for calculating total or system-wide kWh/AF. Metropolitan's approach adds the energy intensity of the individual components to derive a system-wide total, where the required table divides the total net energy use by total deliveries. Metropolitan also incorporates non-consequential hydropower production in its energy intensity calculations.

Table A.9-6 (Table O-1A for Year 2023): Water Supply Process Approach Including Upstream State Water Project Energy Use

Optional Submittal Table O-1A: Recommended Energy Reporting - SINGLE DELIVERY PRODUCT - WATER SUPPLY PROCESS APPROACH										
Water Delivery Product drop down list (If delivering more than one type of product recommend using Table O-1C)		Only for Water Delivery Products Under the Urban Water Supplier's Operational Control								
Start Date of Reporting Period	1/1/2023	Water Management Process							Non-Consequential Hydropower (if applicable)	
End Date of Reporting Period	12/31/2023									
Is upstream embedded energy included in the values reported?										
		Units for Water Volume	Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	**Total Utility** See DWR NOTES	Hydropower	Net Utility
Volume of Water Entering Process		AF			1,777,818	748,025	1,180,000	1,180,000		1,180,000
Energy Consumed (kWh)		N/A			4,972,163,024	56,191,783	-103,425,361	4,924,929,446		4,924,929,446
Energy Intensity (kWh/vol. converted to MG)		N/A	0	0	2,797	75	-88	12,809	0	12,809

DWR NOTES: Total Utility: The volume of water entered in the "Total Utility" column should equal the volume of water entering the distribution system (excluding recycled water); in most cases, this is the total volume calculated in UWMP Table 4-1: 2025 Actual Total Uses for Potable and Non-Potable Water. Note if recycled water is included in your Submittal Table 4-1, you must exclude it from your volume in this table.

Quantity of Self-Generated Renewable Energy

117,453,160 kWh

Data Quality (Estimate, Metered Data, Combination of Estimates and Metered Data)

Combination of Estimates and Metered Data

Data Quality Narrative:

Energy use for treatment and distribution processes are metered. Data does not include energy associated with upstream SWP water deliveries to Metropolitan, as energy intensity data is provided by DWR: https://dwr.maps.arcgis.com/apps/Styler/index.html?appid=c112a21431884158b58fc5564e66c439
Per SWP Energy Intensity of Water Supplies tool, SWP water deliveries to Metropolitan have an energy intensity of 3,254 kWh/AF.

Narrative:

Metropolitan's self-generated renewable energy includes hydropower from hydroelectric power plants within its distribution system as well as solar generation at three water treatment plants. Metropolitan delivers both treated and untreated water to its member agencies.

Glossary

Water-Energy Nexus: The recognition of the link between water supplies and energy supplies.

Energy Intensity: A measure of the energy required to deliver, or process water expressed in kilowatt hours per acre-foot (kWh/AF).

Embedded Energy: The amount of energy required to deliver water supplies from a source to a delivery point. Also expressed in kWh/AF.

Greenhouse Gas Intensity: A measure of the overall greenhouse gasses required to deliver or process water, expressed in GHG/AF.

Hydropower: Renewable energy produced by water powering a turbine to produce electricity.

Water Sector: The water sector in the Water-Energy Nexus is broadly defined to include customer end-uses of water such as heating or cooling; pumping and treating urban and agricultural water supplies; and wastewater disposal.

Consequential Hydropower: Hydropower produced as the sole result of a water demand or use. An example would be a hydropower recovery plant on an aqueduct that generates power as demands dictate flows in the aqueduct.

Non-consequential Hydropower: Hydropower produced as the result of some combination of water demand and other requirements such as flood releases or environmental flows.

The Climate Registry (TCR): A California non-profit organization tasked with managing a voluntary GHG registry for the State as well as implementing a voluntary GHG registry specifically for water-related GHG emissions.

Appendix 10

QUANTIFYING REGIONAL SELF-RELIANCE AND REDUCED RELIANCE ON WATER SUPPLIES FROM THE DELTA WATERSHED

Appendix 10
METROPOLITAN'S
REDUCED DELTA RELIANCE REPORTING

A.10.1 Background

Under the Sacramento-San Joaquin Delta Reform Act of 2009, state and local public agencies proposing a covered action in the Delta,[1] prior to initiating the implementation of that action, must prepare a written certification of consistency with detailed findings as to whether the covered action is consistent with applicable Delta Plan policies and submit that certification to the Delta Stewardship Council.[2] Anyone may appeal a certification of consistency, and if the Delta Stewardship Council grants the appeal, the covered action may not be implemented until the agency proposing the covered action submits a revised certification of consistency, and either no appeal is filed, or the Delta Stewardship Council denies the subsequent appeal.[3]

An urban water supplier that anticipates participating in or receiving water from a proposed covered action such as a multi-year water transfer, conveyance facility, or new diversion that involves transferring water through, exporting water from, or using water in the Delta should provide information in their 2015 and subsequent Urban Water Management Plans (UWMPs) that can then be used in the covered action process to demonstrate consistency with Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (WR P1).[4]

WR P1 details what is needed for a covered action to demonstrate consistency with reduced reliance on the Delta and improved regional self-reliance. WR P1 subsection (a) states that:

> *(a) Water shall not be exported from, transferred through, or used in the Delta if all of the following apply:*
>
> *(1) One or more water suppliers that would receive water as a result of the export, transfer, or use have failed to adequately contribute to reduced reliance on the Delta and improved regional self-reliance consistent with all of the requirements listed in paragraph (1) of subsection (c);*
>
> *(2) That failure has significantly caused the need for the export, transfer, or use; and*
>
> *(3) The export, transfer, or use would have a significant adverse environmental impact in the Delta.*

WR P1 subsection (c)(1) further defines what adequately contributing to reduced reliance on the Delta means in terms of (a)(1) above.

[1] Water Code, § 85057.5; Cal. Code Regs. tit. 23, § 5001.
[2] Water Code, § 85225; Delta Plan, App. D.
[3] Water Code, §§ 85225.10-85225.25; Delta Plan, App. D.
[4] Cal. Code Regs., tit. 23, § 5003.

(c)(1) Water suppliers that have done all the following are contributing to reduced reliance on the Delta and improved regional self-reliance and are therefore consistent with this policy:

- *(A) Completed a current Urban or Agricultural Water Management Plan (Plan) which has been reviewed by the California Department of Water Resources for compliance with the applicable requirements of Water Code Division 6, Parts 2.55, 2.6, and 2.8;*
- *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta; and*
- *(C) Included in the Plan, commencing in 2015, the expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance. The expected outcome for measurable reduction in Delta reliance and improvement in regional self-reliance shall be reported in the Plan as the reduction in the amount of water used, or in the percentage of water used, from the Delta watershed. For the purposes of reporting, water efficiency is considered a new source of water supply, consistent with Water Code section 1011(a).*

The analysis and documentation provided below include all of the elements described in WR P1(c)(1) that need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action.

A.10.2 Summary of Expected Outcomes for Reduced Reliance on the Delta

As stated in WR P1(c)(1)(C), the policy requires that, commencing in 2015, UWMPs include expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance. WR P1 further states that those outcomes shall be reported in the UWMP as the reduction in the amount of water used, or in the percentage of water used, from the Delta.

The expected outcomes for Metropolitan's Delta reliance and regional self-reliance were developed using the approach and guidance described in Appendix C of DWR's Urban Water Management Plan Guidebook 2025 (Guidebook Appendix C) issued in 2025.

The data used in this analysis represent the total regional efforts of Metropolitan and its member agencies and their customers (many of them, retail agencies) and were developed in conjunction with Metropolitan's member agencies as part of the UWMP coordination process as described in Chapter 5 of Metropolitan's UWMP. In accordance with UWMP requirements, Metropolitan's member agencies and their customers (many of them, retail agencies) also report demands and supplies for their service areas in their respective UWMPs. The data reported by those agencies are not additive to the regional totals shown in Metropolitan's UWMP; rather, their reporting represents subtotals of the regional total and should be considered as such for the purposes of determining reduced reliance on the Delta.

While the demands that Metropolitan's member agencies and their customers report in their UWMPs are a good reflection of the demands in their respective service areas, they do not adequately represent each water supplier's contributions to reduced reliance on the Delta. In order to calculate and report their reliance on water supplies from the Delta watershed, water suppliers that receive water from the Delta through other regional or wholesale water suppliers would need to determine the amount of Delta water that they receive from the regional or wholesale supplier. Two specific pieces of information are needed to accomplish this: first is the quantity of demands on the regional or wholesale water supplier that accurately reflect a supplier's contributions to reduced reliance on the Delta, and second is the quantity of a supplier's demands on the regional or wholesale water supplier that are met by supplies from the Delta watershed.

For water suppliers that make investments in regional projects or programs, it may be infeasible to quantify their demands on the regional or wholesale water supplier in a way that accurately reflects their individual contributions to reduced reliance on the Delta. Due to the extensive, long-standing and successful implementation of regional demand management and local resource incentive programs in Metropolitan's service area, this infeasibility holds true for Metropolitan's members as well as their customers. For Metropolitan's service area, reduced reliance on supplies from the Delta watershed can only be accurately accounted at the regional level, as is demonstrated in this analysis.

The following provides a summary of the near-term (2030) and long-term (2050) expected outcomes for Metropolitan's Delta reliance and regional self-reliance. The results show that as a region, Metropolitan and its members as well as their customers are measurably reducing reliance on the Delta and improving regional self-reliance, both as an amount of water used and as a percentage of water used.

Expected Outcomes for Regional Self-Reliance

- Near-term (2030) – Normal water year regional self-reliance is expected to increase by 775 TAF from the 2010 baseline; this represents an increase of almost 23 percent of 2030 normal water year retail demands (Table A.10-2).
- Long-term (2050) – Normal water year regional self-reliance is expected to increase by more than 1.14 MAF from the 2010 baseline; this represents an increase of more than 22 percent of 2050 normal water year retail demands (Table A.10-2).

Expected Outcomes for Reduced Reliance on Supplies from the Delta Watershed

- Near-term (2030) – Normal water year reliance on supplies from the Delta watershed decreased by 486 TAF from the 2010 baseline; this represents a decrease of 7 percent of 2030 normal water year retail demands (Table A.10-3).
- Long-term (2050) – Normal water year reliance on supplies from the Delta watershed decreased by 557 TAF from the 2010 baseline; this represents a decrease of almost 10 percent of 2050 normal water year retail demands (Table A.10-3).

A10.3 Demonstration of Reduced Reliance on the Delta

The methodology used to determine Metropolitan's reduced Delta reliance and improved regional self-reliance is consistent with the approach detailed in DWR's UWMP Guidebook Appendix C, including the use of narrative justifications for the accounting of supplies and

the documentation of specific data sources. Some of the key assumptions underlying Metropolitan's demonstration of reduced reliance include:

- All data were obtained from the current 2025 UWMP or previously adopted UWMPs and represent average or normal water year conditions.
- All analyses were conducted at the service area level, and all data reflect the total contributions of Metropolitan and its members as well as their customers.
- No projects or programs that are described in the UWMPs as "Projects Under Development" were included in the accounting of supplies.

Baseline and Expected Outcomes

In order to calculate the expected outcomes for measurable reduction in Delta reliance and improved regional self-reliance, a baseline is needed to compare against. This analysis uses a normal water year representation of 2010 as the baseline, which is consistent with the approach described in the Guidebook Appendix C. Data for the 2010 baseline were taken from Metropolitan's 2005 UWMP as the UWMPs generally do not provide normal water year data for the year that they are adopted (i.e., 2005 UWMP forecasts begin in 2010, 2010 UWMP forecasts begin in 2015, and so on).

Consistent with the 2010 baseline data approach, the expected outcomes for reduced Delta reliance and improved regional self-reliance for 2015, 2020, and 2025 were taken from Metropolitan's 2010, 2015, and 2020 UWMPs, respectively. Expected outcomes for 2030-2050 are from the current 2025 UWMP. Documentation of the specific data sources and assumptions are included in the discussions below.

Service Area Demands Without Water Use Efficiency

In alignment with the Guidebook Appendix C, this analysis uses normal water year demands, rather than normal water year supplies to calculate expected outcomes in terms of the percentage of water used. Using normal water year demands serves as a proxy for the amount of supplies that would be used in a normal water year, which helps alleviate issues associated with how supply capability is presented to fulfill requirements of the Act versus how supplies might be accounted for to demonstrate consistency with WR P1.

Because WR P1 considers water use efficiency savings a source of water supply, water suppliers such as Metropolitan that explicitly calculate and report water use efficiency savings in their UWMP will need to make an adjustment to properly reflect normal water year demands in the calculation of reduced reliance. As explained in the Guidebook Appendix C, water use efficiency savings must be added back to the normal year demands to represent demands without water use efficiency savings accounted for; otherwise, the effect of water use efficiency savings on regional self-reliance would be overestimated. Table A.10-1 shows the results of this adjustment for Metropolitan. Supporting narratives and documentation for all of the data shown in Table A.10-1 are provided below.

Table A.10-1
Demands without Water Use Efficiency Accounted For

Total Service Area Water Demands (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Service Area Demands with Water Use Efficiency Accounted For	4,628,000	4,563,000	4,163,000	3,763,000	3,811,000	3,897,000	3,937,000	3,959,000	3,993,000
Reported Water Use Efficiency	865,000	936,000	1,056,000	1,162,000	1,171,000	1,223,000	1,289,000	1,357,000	1,419,000
Service Area Demands without Water Use Efficiency Accounted For	**5,493,000**	**5,499,000**	**5,219,000**	**4,925,000**	**4,982,000**	**5,120,000**	**5,226,000**	**5,316,000**	**5,412,000**

Service Area Demands without Water Use Efficiency

The service area demands shown in Table A.10-1 represent the total retail water demands for Metropolitan's service area and include municipal and industrial demands, agricultural demands, seawater barrier demands, and storage replenishment demands. These demand types and the modeling methodologies used to calculate them are described in Chapter 2.2 and Appendix 1 of Metropolitan's UWMP.

Water Use Efficiency

The water use efficiency numbers shown in Table A.10-1 represent the total water use efficiency savings (conservation) for Metropolitan's region, including savings from active, code-based, price-effect and pre-1990 sources. These sources of water use efficiency and the methodologies used to calculate them are described in Chapter 2.2, Chapter 3.4, Chapter 3.7 and Appendix 1 of Metropolitan's UWMP.

The demand and water use efficiency data shown in Table A.10-1 were collected from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table 2-6: Metropolitan Regional Water Demand Average Year
- 2015 values – Metropolitan's 2010 UWMP, Table 2-8: Metropolitan Regional Water Demands Average Year
- 2020 values – Metropolitan's 2015 UWMP, Table 2-3: Metropolitan Regional Water Demands Average Year
- 2025 values – Metropolitan's 2020 UWMP, Table 2-3: Metropolitan Regional Water Demands Normal Water Year
- 2030-2050 values – Metropolitan's 2025 UWMP, Table 2-1: Metropolitan Regional Water Demands Normal Water Year

Supplies Contributing to Regional Self-Reliance

For a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) states that water suppliers must report the expected outcomes for measurable improvement in regional self-reliance. Table A.10-2 shows expected outcomes for supplies contributing to regional self-reliance both in amount and as a percentage. The numbers shown in Table A.10-2 represent efforts to improve regional self-reliance for Metropolitan's entire service area and include the total contributions of Metropolitan and its members as

well as their customers. Supporting narratives and documentation for all of the data shown in Table A.10-2 are provided below.

The results shown in Table A.10-2 demonstrate that Metropolitan's service area is measurably improving its regional self-reliance. In the near-term (2030), the expected outcome for normal water year regional self-reliance increases by 775 TAF from the 2010 baseline; this represents an increase of almost 23 percent of 2030 normal water year retail demands. In the long-term (2050), normal water year regional self-reliance is expected to increase by more than 1.1 MAF from the 2010 baseline; this represents an increase of 22 percent of 2050 normal water year retail demands.

Table A.10-2
Supplies Contributing to Regional Self-Reliance

Water Supplies Contributing to Regional Self-Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Water Use Efficiency	865,000	936,000	1,056,000	1,162,000	1,171,000	1,223,000	1,289,000	1,357,000	1,419,000
Water Recycling	316,000	348,000	436,000	550,000	574,000	652,000	657,000	661,000	675,000
Stormwater Capture and Use	100,000	103,000	110,000	80,000	90,000	74,000	76,000	76,000	76,000
Advanced Water Technologies	111,000	101,000	194,000	194,000	198,000	199,000	200,000	200,000	200,000
Conjunctive Use Projects	1,416,000	1,429,000	1,303,000	1,255,000	1,223,000	1,240,000	1,248,000	1,254,000	1,260,000
Local and Regional Water Supply and Storage Projects	252,000	224,000	261,000	257,000	204,000	202,000	200,000	198,000	197,000
Other Programs and Projects that Contribute to Regional Self-Reliance	875,000	1,250,000	1,200,000	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000	1,250,000
Water Supplies Contributing to Regional Self-Reliance	**3,935,000**	**4,391,000**	**4,560,000**	**4,748,000**	**4,710,000**	**4,840,000**	**4,920,000**	**4,996,000**	**5,077,000**

Service Area Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Service Area Demands without Water Use Efficiency Accounted For	5,493,000	5,499,000	5,219,000	4,925,000	4,982,000	5,120,000	5,226,000	5,316,000	5,412,000

Change in Regional Self-Reliance (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Water Supplies Contributing to Regional Self-Reliance	3,935,000	4,391,000	4,560,000	4,748,000	4,710,000	4,840,000	4,920,000	4,996,000	5,077,000
Change in Supplies Contributing to Regional Self-Reliance	**NA**	**456,000**	**625,000**	**813,000**	**775,000**	**905,000**	**985,000**	**1,061,000**	**1,142,000**

Percent Change in Regional Self-Reliance (As Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Percent of Supplies Contributing to Regional Self-Reliance	71.6%	79.9%	87.4%	96.4%	94.5%	94.5%	94.1%	94.0%	93.8%
Change in Percent of Supplies Contributing to Regional Self-Reliance	**NA**	**8.2%**	**15.7%**	**24.8%**	**22.9%**	**22.9%**	**22.5%**	**22.3%**	**22.2%**

Water Use Efficiency

The water use efficiency information shown in Table A.10-2 is taken directly from Table A.10-1 above.

Water Recycling

The water recycling values shown in Table A.10-2 reflect the total recycled water production in Metropolitan's service area as described in Chapter 3.5 and Appendix 2 of Metropolitan's UWMP.

Stormwater Capture and Use

The stormwater capture and use data shown in Table A.10-2 include supplies from local surface water production as described in Chapter 1.4 and Appendix 2 of Metropolitan's UWMP.

These values do not include production from regional storage reservoirs; storage in these reservoirs is comprised of previously stored water from sources already reflected in Tables A.10-2 and A.10-3. These regional storage resources are generally used to provide additional regional self-reliance in dry years, which is not reflected in this normal water year

analysis. The regional storage reservoirs and their yields are described in Chapter 3.6, Appendix 2 and Appendix 3 of Metropolitan's UWMP.

The stormwater capture and use values shown in Table A.10-2 also do not include stormwater capture that is used to recharge local groundwater basins. Stormwater capture for groundwater recharge supports production of groundwater in the region, and for the purposes of this analysis that production is already captured in Table A.10-2 under conjunctive use projects.

Advanced Water Technologies

The advanced water technologies data shown in Table A.10-2 include total groundwater recovery and seawater desalination production in Metropolitan's service area as described in Chapter 3.5 and Appendix 2 of Metropolitan's UWMP.

Conjunctive Use Projects

The values for conjunctive use projects shown in Table A.10-2 represent total groundwater production in the region as described in Chapter 1.4 and Appendix 2 of Metropolitan's UWMP.

The conjunctive use projects numbers shown in Table A.10-2 do not include production from regional groundwater conjunctive use programs. As described in the stormwater capture and use discussion above, these regional storage programs rely on previously stored water from sources already reflected in Tables A.10-2 and A.10-3 and are generally used to provide additional regional self-reliance in dry years. The regional groundwater conjunctive use programs and their yields are described in Chapter 3.6 and Appendix 3.

Local and Regional Water Supply and Storage Programs

The data for local and regional water supply and storage programs shown in Table A.10-2 include supplies from the Los Angeles Aqueduct. This supply is described in Chapter 1.4 and Appendix 2 of Metropolitan's UWMP.

The local and regional supply numbers shown in Table A.10-2, except for "Other Programs and Projects that Contribute to Regional Self-Reliance" which is discussed below, were obtained from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table 2-6: Metropolitan Regional Water Demand Average Year
- 2015 values – Metropolitan's 2010 UWMP, Table 2-8: Metropolitan Regional Water Demands Average Year
- 2020 values – Metropolitan's 2015 UWMP, Table 2-3: Metropolitan Regional Water Demands Average Year
- 2025 values – Metropolitan's 2020 UWMP, Table 2-3: Metropolitan Regional Water Demands Normal Water Year
- 2030-2050 values – Metropolitan's 2025 UWMP, Table 2-1: Metropolitan Regional Water Demands Normal Water Year

Other Programs and Projects that Contribute to Regional Self-Reliance

Other programs and projects that contribute to regional self-reliance shown in Table A.10-2 include current programs from the Colorado River Aqueduct. Colorado River supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA. Colorado River Aqueduct supplies and programs are described in Chapter 3.1 and Appendix 3 of Metropolitan's UWMP.

The values shown in Table A.10-2 for other programs and projects that contribute to regional self-reliance come from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2010 (Average Year)
- 2015 values – Metropolitan's 2010 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2015 (Average Year)
- 2020 values – Metropolitan's 2015 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2020 (Average Year)
- 2025 values – Metropolitan's 2020 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Year 2025 (Normal Water Year)
- 2030-2050 values – Metropolitan's 2025 UWMP, Table A.3-7: Maximum Expected Colorado River Aqueduct Deliveries Years 2030, 2035, 2040, 2045, 2050 (Normal Water Year)

Reliance on Water Supplies from the Delta Watershed

In order for a covered action to demonstrate consistency with the Delta Plan, WR P1 subsection (c)(1)(C) requires that water suppliers report the expected outcomes for measurable reductions in supplies from the Delta watershed either as an amount or as a percentage. This analysis provides both calculations. Based on the methodology described in Guidebook Appendix C, and consistent with the approach of this analysis in not including projects under development, this accounting does not include any supplies from potential future covered actions. Table A.10-3 shows the expected outcomes for reliance on supplies from the Delta watershed for Metropolitan's service area. Supporting narratives and documentation for all of the data shown in Table A.10-3 are provided below.

The results shown in Table A.10-3 demonstrate that Metropolitan's service area is measurably reducing its Delta reliance. In the near-term (2030), the expected outcome for normal water year reliance on supplies from the Delta watershed decreased by 486 TAF from the 2010 baseline; this represents a decrease of 7 percent of 2030 normal water year retail demands. In the long-term (2050), normal water year reliance on supplies from the Delta watershed decreased by 557 TAF from the 2010 baseline; this represents a decrease of almost 10 percent of 2050 normal water year retail demands.

Table A.10-3
Reliance on Water Supplies from the Delta Watershed

Water Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
CVP/SWP Contract Supplies	1,472,000	1,029,000	984,000	1,133,000	949,000	924,000	901,000	877,000	877,000
Delta/Delta Tributary Diversions	-	-	-	-	-	-	-	-	-
Transfers and Exchanges of Supplies from the Delta Watershed	20,000	44,000	91,000	58,000	57,000	57,000	58,000	58,000	58,000
Other Water Supplies from the Delta Watershed	-	-	-	-	-	-	-	-	-
Total Water Supplies from the Delta Watershed	**1,492,000**	**1,073,000**	**1,075,000**	**1,191,000**	**1,006,000**	**981,000**	**959,000**	**935,000**	**935,000**

Service Area Demands without Water Use Efficiency (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Service Area Demands without Water Use Efficiency Accounted For	5,493,000	5,499,000	5,219,000	4,925,000	4,982,000	5,120,000	5,226,000	5,316,000	5,412,000

Change in Supplies from the Delta Watershed (Acre-Feet)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Water Supplies from the Delta Watershed	1,492,000	1,073,000	1,075,000	1,191,000	1,006,000	981,000	959,000	935,000	935,000
Change in Supplies from the Delta Watershed	**NA**	**(419,000)**	**(417,000)**	**(301,000)**	**(486,000)**	**(511,000)**	**(533,000)**	**(557,000)**	**(557,000)**

Percent Change in Supplies from the Delta Watershed (As a Percent of Demand w/out WUE)	Baseline (2010)	2015	2020	2025	2030	2035	2040	2045	2050
Percent of Supplies from the Delta Watershed	27.2%	19.5%	20.6%	24.2%	20.2%	19.2%	18.4%	17.6%	17.3%
Change in Percent of Supplies from the Delta Watershed	**NA**	**-7.6%**	**-6.6%**	**-3.0%**	**-7.0%**	**-8.0%**	**-8.8%**	**-9.6%**	**-9.9%**

CVP/SWP Contract Supplies

The CVP/SWP contract supplies shown in Table A.10-3 include Metropolitan's SWP Table A and Article 21 supplies. These supplies are described in Chapter 3.2 and Appendix 3 of Metropolitan's UWMP.

The values shown in Table A.10-3 do not include Desert Water Agency/Coachella Valley Water District SWP contract supplies. These supplies are exchanged with Desert Water Agency and Coachella Valley Water District for an equal amount of Colorado River water, which is reflected in the Colorado River Aqueduct supplies shown in Table A.10-2. In addition, Desert Water Agency and Coachella Valley Water District should include their SWP contract supplies in their own accountings of reduced reliance. Additional information on these exchange agreements can be found in Chapter 3.2 and Appendix 3 of Metropolitan's UWMP.

These values also do not include supplies from San Luis Carryover storage or Central Valley storage programs because storage in these programs comprises previously stored water from sources already reflected in Table A.10-3. These storage programs are generally used to provide additional regional self-reliance in dry years, which is not reflected in this normal water year analysis. The Central Valley storage projects and their yields are described in Chapter 3.3 and Appendix 3. San Luis Carryover storage is described in Chapter 3.2 and Appendix 3.

Transfers and Exchanges of Supplies from the Delta Watershed

The transfers and exchanges of supplies from the Delta watershed shown in Table A.10-3 include supplies from the San Bernardino Valley MWD Program, Yuba River Accord Purchase Program, the San Gabriel Valley MWD Program, and other generic SWP and Central Valley transfers and exchanges. These programs are described in Chapter 3.2 and Appendix 3 of Metropolitan's UWMP.

Supplies from the Delta Watershed shown in Table A.10-3 are from the following sources:

- Baseline (2010) values – Metropolitan's 2005 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2010 (Average Year)

- 2015 values – Metropolitan's 2010 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2015 (Average Year)
- 2020 values – Metropolitan's 2015 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2020 (Average Year)
- 2025 values – Metropolitan's 2020 UWMP, Table A.3-7: California Aqueduct Program Capabilities Year 2025 (Normal Water Year)
- 2030-2050 values – Metropolitan's 2025 UWMP, Table A.3-7: California Aqueduct Program Capabilities Years 2030, 2035, 2040, 2045, 2050 (Normal Water Year)

A.10.4 UWMP Implementation

In addition to the analysis and documentation described above, WR P1 subsection (c)(1)(B) requires that all programs and projects included in the UWMP that are locally cost-effective and technically feasible, which reduce reliance on the Delta, are identified, evaluated, and implemented consistent with the implementation schedule. WR P1 (c)(1)(B) states that:

> *(B) Identified, evaluated, and commenced implementation, consistent with the implementation schedule set forth in the Plan, of all programs and projects included in the Plan that are locally cost effective and technically feasible which reduce reliance on the Delta*[.]

In accordance with Water Code Chapter 10631(f), water suppliers must already include in their UWMP a detailed description of expected future projects and programs that they may implement to increase the amount of water supply available to them in normal and single-dry water years and for a period of drought lasting five consecutive years. The UWMP description must also identify specific projects, include a description of the increase in water supply that is expected to be available from each project, and include an estimate regarding the implementation timeline for each project or program.

Chapter 3 of Metropolitan's UWMP summarizes the implementation plan and continued progress in developing a diversified water portfolio to meet the region's water needs.

Water Use Efficiency

The water use efficiency numbers used in this analysis include the total water use efficiency savings (conservation) for the service area, including savings from active, code-based, price-effect and pre-1990 savings. The specific water use efficiency programs and their implementation are described in Chapter 3.4 of Metropolitan's UWMP.

Water Recycling

The water recycling values used in this analysis reflect the total recycled water production in Metropolitan's service area. Water recycling programs and implementation are discussed in Chapter 3.5 of Metropolitan's UWMP. In addition, individual project-level details are provided in Appendix 5.

Stormwater Capture and Use

The stormwater capture and use data used in this analysis include supplies from local surface water production. Local surface water production and its implementation are discussed in Appendix 2 of Metropolitan's UWMP.

Advanced Water Technologies

The advanced water technologies data used in this analysis include total groundwater recovery and seawater desalination production in Metropolitan's service. Groundwater recovery and seawater desalination programs and implementation are described in Chapter 3.5 of Metropolitan's UWMP. In addition, individual project-level details are provided in Appendix 5.

Conjunctive Use Projects

The values for conjunctive use projects used in this analysis represent total groundwater production in the region. Groundwater production and its implementation are discussed in Appendix 2 of Metropolitan's UWMP.

Local and Regional Water Supply and Storage Programs

The data for local and regional water supply and storage programs shown in this analysis include supplies from the Los Angeles Aqueduct. This program and its implementation are described in Appendix 2 of Metropolitan's UWMP.

Other Programs and Projects that Contribute to Regional Self-Reliance

Other programs and projects that contribute to regional self-reliance used in this analysis include current programs from the Colorado River Aqueduct. Colorado River supplies include Metropolitan's basic Colorado River apportionment, as well as supplies that result from existing and committed programs, including those from the IID-MWD Conservation Program, the implementation of the Quantification Settlement Agreement (QSA), related agreements, and the exchange agreement with SDCWA. Colorado River Aqueduct programs and their implementation are described in Chapter 3.1 and Appendix 3 of Metropolitan's UWMP.

CVP/SWP Contract Supplies

The CVP/SWP contract supplies shown in this analysis include Metropolitan's SWP Table A and Article 21 supplies. These supplies and their implementation are described in Chapter 3.2 and Appendix 3 of Metropolitan's UWMP.

Transfers and Exchanges of Supplies from the Delta Watershed

The transfers and exchanges of supplies from the Delta watershed shown in this analysis include supplies from the San Bernardino Valley MWD Program, Yuba River Accord Purchase Program, the San Gabriel Valley MWD Program, and other generic SWP and Central Valley transfers and exchanges. These programs and their implementation are described in Chapter 3.2 and Appendix 3 of Metropolitan's UWMP.

Appendix 11

DWR SUBMITTAL TABLES

(Standardized Tables)

Submittal Table 2-2: Plan Identification			
Select One or Both	**Type of Plan**		**Name of Regional Alliance or RUWMP** (Drop Down List)
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a SB X7-7 Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☑	Supplier is a wholesale supplier
☐	Supplier is a retail supplier
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
If using fiscal years provide month and date that the fiscal year begins (mm/dd)	
Units of measure used in UWMP (Select from the drop down list).	
Unit	AF
DWR NOTES: **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Submittal Table 2-3.	
NOTES:	

Submittal Table 2-4 Wholesale: Water Supplier Information Exchange Water Code Section 10631(h)	
☑	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with Water Code Section 10631(h). Completion of the table below is optional. If not completed, include a list of the water suppliers that were informed.
5-7 to 5-8	Provide page number for location of the list.
☐	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with Water Code Section 10631(h). **Complete the table below.**
Water Supplier Name	
Add additional rows as needed	
NOTES: See 2025 UWMP chapters 2 and 5 for discussion of Metropolitan's planning cooridnation, outreach, and notification. List provided in Chapter 5, Table 5-3, pp. 5-7 and 5-8.	

Submittal Table 3-1 Wholesale: Population - Current and Projected Water Code Section 10631(a)						
Population Served	2025	2030	2035	2040	2045	2050(opt)
	18,794,000	19,361,000	19,757,000	20,085,000	20,295,000	20,395,000
NOTES: See 2025 UWMP Appendix 1, Table A.1-2.						

OPTIONAL Submittal Table 4-2 Wholesale: Uses for Potable and Non-Potable Water - Projected
Water Code Section 10631(d)(1)

Use Type	Additional Description (as needed)	Projected Water Use (Report To the Extent that Records are Available)					
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool.		Level of Treatment When Delivered (OPTIONAL) Drop down list	**2030** (AF)	**2035** (AF)	**2040** (AF)	**2045** (AF)	**2050** (opt) (AF)
Add additional rows as needed							
Other (optional)			1,228,000	1,237,000	1,261,000	1,277,000	1,291,000
Exchanges to other agencies			294,000	294,000	294,000	294,000	294,000
Subtotal Potable			0	0	0	0	0
Subtotal Non-Potable			0	0	0	0	0
Total			1,522,000	1,531,000	1,555,000	1,571,000	1,585,000

DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.

NOTES: See 2025 UWMP detailed discussion in Chapter 2, Metropolitan's Regional Water Demands Table 2-1 for Normal Year, and Supply Capability and Projected Demands Table 2-4 for Normal Year (average 1922-2021 hydrologies)

Submittal Table 6-1 Wholesale: Groundwater Volume Pumped
Water Code Section 10631(4) and 10631(4)(C)

☑	Check the box if the Supplier does not pump groundwater. Proceed to the next table.
☐	Check the box if all or part of the groundwater described below is desalinated. (OPTIONAL)

Groundwater Type **Drop Down List** May use each category multiple times	Water Type (OPTIONAL) **Drop down list**	Location or Basin Name	2021 (AF)	2022 (AF)	2023 (AF)	2024 (AF)	2025 (AF)
Add additional rows as needed							
		Total	0	0	0	0	0

DWR NOTES:
Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.

NOTES:

Submittal Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2025
Water Code Section 10633(a)

☑ Check the box if the Wholesale Supplier neither distributes nor provides supplemental treatment to recycled water. Proceed to the next table.

Wastewater Treatment Plant Name and Place ID Number **Drop down list**	Does This Plant Treat Wastewater Generated Outside the UWMP Service Area? (OPTIONAL) **Drop down list**	2025 Volume of Wastewater Received from UWMP Service Area	Total 2025 Volume of Water Treated	2025 Outcomes of Treated Wastewater										
				Water Recycled Within UWMP Service Area (enter data as applicable)		**Water Recycled Outside of UWMP Service Area** (enter data as applicable)		**Effluent Discharge that is not a Permitted Recycled Water Use** (enter data as applicable)		**Required Discharge for Instream Flow** (enter data as applicable)		**Delivered to Another Entity for Additional Treatment** (enter data as applicable)		
				Treatment Level **Drop down list**	Volume	Treatment Level **Drop down list**	Volume	Treatment Level **Drop down list**	Volume	Treatment Level **Drop down list**	Volume	Treatment Level **Drop down list**	Volume	Name of other entity
		(AF)	(AF)		(AF)		(AF)		(AF)		(AF)		(AF)	
Add additional rows as needed.														
Total		0	0		0		0		0		0		0	

DWR NOTES:
Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Table 2-3.
Additional Guidance. See Appendix M, Section M.21 for detailed guidance on this table.

NOTES:

Submittal Table 6-4 Wholesale: Current and Projected Recycled Water Uses
Water Code Section 10633(c)(e)

☑ Check box if recycled water is not used and is not planned for use within the service area of the supplier. The supplier will only complete the column on "Potential Recycled Water Use" and submit an accompanying narrative on the feasibility of that potential recycled water use.

Name(s) of Facility/ies Producing (Treating) the Recycled Water (OPTIONAL) :	
Name of Supplier Operating the Recycled Water Distribution System (OPTIONAL) :	
Supplemental Water Added in 2025 (volume) Include units (OPTIONAL) :	
Source of 2025 Supplemental Water (OPTIONAL) :	

Name of Receiving Supplier or Direct Use by Wholesale Supplier	Water Type (after treatment if treated) (OPTIONAL) **Drop down list**	Additional Information (as needed)	2025	2030	2035	2040	2045	2050 (opt)	**Potential Recycled Water Use**	
			(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	Volume	Narrative page number (OPTIONAL)
Add additional rows as needed										
		Total	0	0	0	0	0	0	0	0

DWR NOTES:
Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table reports the unit of measure selected in Submittal able 2-3.
Additional Guidance. See Appendix M, Section M.21 for detailed guidance on this table.
Potential recycled water use - a description of the feasibility of these uses must be included in the narrative.
Multiple Producers: If you have multiple recycled water producers, submit a separate table for each.

NOTES:

Submittal Table 6-5 Wholesale: 2020 UWMP Recycled Water Use Projection Compared to 2025 Actual Water Code Section 10633(e)		
☑	Check the box if recycled water was not used or distributed by the supplier in 2025, nor projected for use or distribution in 2020. Proceed to the next table.	
Name of Receiving Supplier or Direct Use by Wholesale Supplier	2020 Projection for 2025 (AF)	2025 Actual Use (AF)
Add additional rows as needed		
Total	0	0
DWR NOTES: **Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Table 2-3. **Additional Guidance.** See Appendix M, Section M.21 for detailed guidance on this table.		
NOTES:		

Submittal Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs Water Code Section 10631(f)							
☐	Check the box if there are no expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Proceed to the next table.						
☑	Check the box if some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.						
	Provide page location of narrative in the UWMP						
Name of Future Projects or Programs	Joint Project with other suppliers?		Additional Description (as needed)	Water Type (after treatment if treated) (OPTIONAL) **Drop down list**	Planned Implementation Year	Planned for Use in Year Type **Drop Down list**	Expected Increase in Water Supply to Supplier (This may be a range)
	Drop Down List (yes/no)	If Yes, Supplier Name					(AF)
Add additional rows as needed							
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure reported in Submittal Table 2-3.							
NOTES: See 2025 UWMP Chapter 3 description of resources and program development for CRA, SWP, Central Valley/SWP storage and transfers programs, conservation, LRP (groundwater recovery, recycling desaliantion), and groundwater. Also, see Appendix 3 for a detailed discussion of all supply programs and							

Submittal Table 6-8 Wholesale: Water Supplies — 2025 Actual
Water Code Section 10631(b)

Water Supply	Additional Description (as needed)	2025		
Drop down list May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool		**Water Type** (after treatment if treated) (OPTIONAL) **Drop Down list**	**Actual Volume**	**Total Entitlement** (OPTIONAL) See "DWR Notes" below
			(AF)	(AF)
Add additional rows as needed				
Purchased or Imported Water	raw water		2,003,000	
		Subtotal Potable	0	0
		Subtotal Non-Potable	0	0
		Total	2,003,000	0

DWR NOTES:
Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in Submittal Table 2-3.
Total Entitlement: e.g. Water Right, Groundwater Allocation, Contracted Amount.

NOTES: Volumes of water reported in this table are raw water.

Submittal Table 6-9 Wholesale: Water Supplies — Projected
Water Code Section 10631 (b)

Water Supply			Projected Water Supply (Report to the Extent Practicable)									
			2030		2035		2040		2045		2050 (opt)	
Drop down list May use each category multiple times.These are the only water supply categories that will be recognized by the WUEdata online submittal tool	Additional Detail on Water Supply	**Water Type** (after treatment if treated) (OPTIONAL) **Drop Down list**	Reasonably Available Volume	Total Entitlement (OPTIONAL) See "DWR Notes" below	Reasonably Available Volume	Total Entitlement (OPTIONAL) See "DWR Notes" below	Reasonably Available Volume	Total Entitlement (OPTIONAL) See "DWR Notes" below	Reasonably Available Volume	Total Entitlement (OPTIONAL) See "DWR Notes" below	Reasonably Available Volume	Total Entitlement (OPTIONAL) See "DWR Notes" below
			(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)	(AF)
Add additional rows as needed												
Other (optional)			3,764,000		3,718,000		3,662,000		3,621,000		3,748,000	
Subtotal Potable			0	0	0	0	0	0	0	0	0	0
Subtotal Non-Potable			0	0	0	0	0	0	0	0	0	0
Total			3,764,000	0	3,718,000	0	3,662,000	0	3,621,000	0	3,748,000	0

DWR NOTES:
Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3. This table identifies the unit of measure selected in a Submittal Table 2-3.
Total Entitlement: e.g. Water Right, Groundwater Allocation, Contracted Amount.
NOTES: See 2025 UWMP detailed discussion in Chapter 2 and Supply Capability and Projected Demands Table 2-4 for Normal Year (average of 1922-2021 hydrologies). Projected water supply includes capability of current programs and programs under development.

Submittal Table 7-2 Wholesale: Normal Year Supply and Use Comparison Water Code Section 10635 (a)					
	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)	2050 (Opt) (AF)
Supply totals (autofill from Submittal Table 6-9 W)	3,764,000	3,718,000	3,662,000	3,621,000	3,748,000
Use totals (see OPTIONAL Submittal Table 4-2 W)	1,522,000	1,531,000	1,555,000	1,571,000	1,585,000
Surplus/(shortfall)	2,242,000	2,187,000	2,107,000	2,050,000	2,163,000
OPTIONAL Planned WSCP Actions					
WSCP - supply augmentation benefit					
WSCP - use reduction savings benefit					
Revised Surplus/(shortfall)					
DWR NOTES : Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.					
NOTES: See 2025 UWMP detailed discussion in Chapter 2 and Supply Capabilities and Reliability Assessment in Table 2-4 for Normal Water Year (average of 1922-2021 hydrologies)					

Submittal Table 7-5 Wholesale: Five-Year Drought Risk Assessment Water Code Section 10635(b)(3)		
2026		**Total**
Total Water Use	(AF)	1,515,000
Total Supplies	(AF)	973,000
Surplus/Shortfall w/o WSCP Action		(542,000)
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit	(AF)	542,000
WSCP - use reduction savings benefit	(AF)	0
Revised Surplus/(shortfall)		0
2027		**Total**
Total Water Use	(AF)	1,639,000
Total Supplies	(AF)	2,267,000
Surplus/Shortfall w/o WSCP Action		628,000
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit	(AF)	0
WSCP - use reduction savings benefit	(AF)	0
Revised Surplus/(shortfall)		628,000
2028		**Total**
Total Water Use	(AF)	1,728,000
Total Supplies	(AF)	1,170,000
Surplus/Shortfall w/o WSCP Action		(558,000)
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit	(AF)	558,000
WSCP - use reduction savings benefit	(AF)	0
Revised Surplus/(shortfall)		0
2029		**Total**
Total Water Use	(AF)	1,567,000
Total Supplies	(AF)	1,197,000
Surplus/Shortfall w/o WSCP Action		(370,000)
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit	(AF)	370,000
WSCP - use reduction savings benefit	(AF)	0
Revised Surplus/(shortfall)		0
2030		**Total**
Total Water Use	(AF)	1,588,000
Total Supplies	(AF)	1,301,000
Surplus/Shortfall w/o WSCP Action		(287,000)
OPTIONAL Planned WSCP Actions (use reduction and supply augmentation)		
WSCP - supply augmentation benefit	(AF)	287,000
WSCP - use reduction savings benefit	(AF)	
Revised Surplus/(shortfall)		0
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.		
NOTES: Totals may not foot due to rounding. See 2025 UWMP discussion in 2.4 Drought Risk Assessment regarding supply augmentation actions that may be exercised to meet demands through 2030.		

Submittal Table 8-1: Cross-reference for Standard vs Supplier Shortage Levels
Water Code Section 10632(a)(3)(B)

☑	Check the box if the Supplier uses the Standard six levels of water shortage. Proceed to the next table.

Standard Shortage Levels	Percent Shortage Range	Suppliers Shortage Levels	Percent Shortage Range
1	Up to 10%	Shortage response actions will be customized to meet the circumstances for the particular shorage. Response actions may include a combination of supply augmentation from flexible supplies and dry-year storage, demand response actions, and operational measures.	Up to 10%
2	Up to 20%	Shortage response actions will be customized to meet the circumstances for the particular shorage. Response actions may include a combination of supply augmentation from flexible supplies and dry-year storage, demand response actions, and operational measures.	Up to 20%
3	Up to 30%	Shortage response actions will be customized to meet the circumstances for the particular shorage. Response actions may include a combination of supply augmentation from flexible supplies and dry-year storage, demand response actions, and operational measures.	Up to 30%
4	Up to 40%	Shortage response actions will be customized to meet the circumstances for the particular shorage. Response actions may include a combination of supply augmentation from flexible supplies and dry-year storage, demand response actions, and operational measures.	Up to 40%
5	Up to 50%	Shortage response actions will be customized to meet the circumstances for the particular shorage. Response actions may include a combination of supply augmentation from flexible supplies and dry-year storage, demand response actions, and operational measures.	Up to 50%
6	>50%	Shortage response actions will be customized to meet the circumstances for the particular shorage. Response actions may include a combination of supply augmentation from flexible supplies and dry-year storage, demand response actions, and operational measure, as well as emergency storage during a castrophic event	>50%

NOTES: Actions taken will be based on resource and operational conditions throughout the year. To determine specific actions that would be taken at each level, Metropolitan will evaluate circumstances including cost, timing, distribution needs and capabilities, and other variables that include SWP allcoation, Colroado River conditions, take capacities, and storage balances. See Table A.4-5 Shortage Stages and Response Actions from Appendix 4: Water Shortage Contingency Plan.

Submittal Table 8-2 Wholesale: Supply Augmentation and Other Actions
Water Code Section 10632(a)(4)(A),(C) and (E)

	Is the Supplier completing this table using the standard six levels? (yes/no)			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier **Drop down list** These are the only categories that will be accepted by the WUEdata online submittal tool	How much is this going to reduce the shortage gap?		Additional Explanation or Reference (OPTIONAL)
		Volume or Percentage Drop down	Shortage Gap Reduction Value (May be a range) (AF)	
Add additional rows as needed				
1 to 6	Other Actions (describe)	Volume		Flexible supplies and dry year storage. Based on a hypothetical 2030 single dry year assessment within the 2025 Urban Water Management Plan.
6	Stored Emergency Supply	Volume		Based on Metropoltian's Emergency Storage Objective, set at 750,000 AF. Emergency storage represents water Metropolitan reserves for the region for use in the event of suppy interuptions from earthquakes or similar emergencies
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.				
NOTES:				

Submittal Table 8-3 Wholesale: Demand Reduction Actions
Water Code Section 10632(a)(4)(B) and (E)

	Is the Supplier completing this table using the standard six levels? (yes/no)			
Shortage Level	Demand Reduction Actions **Drop down list** These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.	How much is this going to reduce the shortage gap?		Additional Explanation or Reference (OPTIONAL)
		Volume or Percentage Drop down	Shortage Gap Reduction Value (May be a range) (AF)	
Add additional rows as needed				
1 to 6	Expand Public Information Campaign	Volume	Up to 450,000 AF	Assumed up to 10% effectiveness in demand reduction realized at the retail level, using a hypothetical single dry year assessment of wholesale demand within the 2025 Urban Water Management Plan (2030 single dry year). Based on assumptions of service area retail M&I demand of 4.496 MAF and up to 20 percent of retail demands could be reduced if a successful media campaign reached and influenced the entire service area population (source: American Water Works Association. 2019. Manual of Water Supply Practices – M60, Second Edition: Drought Preparedness and Response. p. 35)
1 to 6	Other	Volume	Up to 900,000 AF	Water Supply Allocation Plan (WSAP) allocates Metropolitan's wholesale water supplies among its member agencies. The WSAP is designed to reduce demands by up to approximately 50 percent of the WSAP's calculated base demand. Up to 900,000 AF of savings is based on a hypothetical WSAP base demand of 1.8 MAF. Actual reductions and base demands are based on a formula that includes various factors such as actual local supply production, population growth, and conservation.
DWR NOTES: Units of measure (AF, CCF, MG) must remain consistent throughout the UWMP as reported in Submittal Table 2-3.				
NOTES: Total estimated savings potential from differerent Demand Reducation Actions are nonadditive. Savings potential from voluntary actions overlaps with savings from supply allocations.				

Submittal Table 10-1 Wholesale: Notification to Cities and Counties Water Code Section 10621(b) and 10642		
☑	Check the box if the Supplier has notified more than 10 cities or counties in accordance with Water Code Sections 10621 (b) and 10642. **Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.**	
2025 UWMP Chapter 5 Table 5-3	Provide the page or location of this list in the UWMP.	
☐	Check the box if the Supplier has notified 10 or fewer cities or counties. **Complete the table below.**	
City Name	60 Day Notice **Drop Down (yes/no)**	Notice of Public Hearing **Drop Down (yes/no)**
Add additional rows as needed		
County Name **Drop Down List**	60 Day Notice **Drop Down (yes/no)**	Notice of Public Hearing **Drop Down (yes/no)**
Add additional rows as needed		
NOTES: See 2025 UWMP Chapter 5 discussion on Metropolitan's notification to cities and counties in its service area. List is provided in Table 5-3.		

Optional Submittal Table O-1A: Recommended Energy Reporting - SINGLE DELIVERY PRODUCT - WATER SUPPLY PROCESS APPROACH

Water Delivery Product drop down list (If delivering more than one type of product recommend using Table O-1C)		Only for Water Delivery Products Under the Urban Water Supplier's Operational Control								
Start Date of Reporting Period	1/1/2023	Water Management Process							Non-Consequential Hydropower (if applicable)	
End Date of Reporting Period	12/31/2023									
Is upstream embedded energy included in the values reported?										
		Units for Water Volume	Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	**Total Utility** See DWR NOTES	Hydropower	Net Utility
Volume of Water Entering Process		AF			1,777,818	748,025	1,180,000	1,180,000		1,180,000
Energy Consumed (kWh)		N/A			4,972,163,024	56,191,783	-103,425,361	4,924,929,446		4,924,929,446
Energy Intensity (kWh/vol. converted to MG)		N/A	0	0	2,797	75	-88	12,809	0	12,809

DWR NOTES: Total Utility: The volume of water entered in the "Total Utility" column should equal the volume of water entering the distribution system (excluding recycled water); in most cases, this is the total volume calculated in UWMP Table 4-1: 2025 Actual Total Uses for Potable and Non-Potable Water. Note if recycled water is included in your Submittal Table 4-1, you must exclude it from your volume in this table.

Quantity of Self-Generated Renewable Energy

117,453,160 kWh

Data Quality (Estimate, Metered Data, Combination of Estimates and Metered Data)

Combination of Estimates and Metered Data

Data Quality Narrative:

Energy use for treatment and distribution processes are metered. Data does not include energy associated with upstream SWP water deliveries to Metropolitan, as energy intensity data is provided by DWR: https://dwr.maps.arcgis.com/apps/Styler/index.html?appid=c112a21431884158b58fc5564e66c439
Per SWP Energy Intensity of Water Supplies tool, SWP water deliveries to Metropolitan have an energy intensity of 3,254 kWh/AF.

Narrative:

Metropolitan's self-generated renewable energy includes hydropower from hydroelectric power plants within its distribution system as well as solar generation at three water treatment plants. Metropolitan delivers both treated and untreated water to its member agencies.



About Metropolitan

The Metropolitan Water District of Southern California is a state-established cooperative that provides water to its 26 member agencies in a service area of nearly 19 million people across six counties. The district imports water from the Colorado River and Northern California to supplement local supplies, and helps its members to develop increased water conservation, recycling, storage and other resource-management programs.

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May 2026__

Water Shortage Contingency Plan

May 2026 Draft

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA





The Metropolitan Water District of Southern California

Water Shortage Contingency Plan

(FINAL DRAFT May 2026)

Including
Water Surplus and Drought Management Plan,
Water Supply Allocation Plan, and
WSCP Resolution xxxx

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List of Acronyms and Abbreviations

AF	Acre-feet
Bard	Bard Water District
CRA	Colorado River Aqueduct
CUP	Conjunctive Use Programs
CVWD	Coachella Valley Water District
CWC	California Water Code
DWA	Desert Water Agency
DWR	California Department of Water Resources
IID	Imperial Irrigation District
IRP	Integrated Water Resources Plan
ICS	Lake Mead Intentionally Created Surplus
MAF	Million Acre-feet
MWD	The Metropolitan Water District of Southern California
MWD Act	Metropolitan Water District Act
PVID	Palo Verde Irrigation District
QSA	Quantification Settlement Agreement
SDCWA	San Diego County Water Authority
SNWA	Southern Nevada Water Authority
SWP	State Water Project
TAF	Thousand Acre-Feet
USBR	United States Bureau of Reclamation
UWMP	Urban Water Management Plan
WSAP	Water Supply Allocation Plan
WSCP	Water Shortage Contingency Plan
WSDM	Water Surplus and Drought Management

Appendix 4
WATER SHORTAGE CONTINGENCY PLAN

This Water Shortage Contingency Plan (WSCP) complies with California Water Code (CWC) Section 10632, which requires that every urban water supplier shall prepare and adopt a WSCP as part of its urban water management plan (UWMP). Section 10632.2 provides, "An urban water supplier shall follow, where feasible and appropriate, the prescribed procedures and implement determined shortage response actions in its water shortage contingency plan...or reasonable alternative actions, provided that descriptions of the alternative actions are submitted with the annual water shortage assessment report pursuant to Section 10632.1." Notwithstanding, the CWC does not prohibit an urban water supplier from taking actions not specified in its WSCP, if needed, without having to formally amend its UWMP or WSCP.

The WSCP is a guide for the Metropolitan Water District of Southern California's (Metropolitan's) intended actions during water shortage conditions. It is meant to improve preparedness for droughts and other impacts on water supplies by describing the process used to address varying degrees of water shortages. Certain elements of the WSCP are required by the CWC, including response actions that align with six standard water shortage levels based on water supply conditions, as well as shortages resulting from catastrophic supply interruptions. The WSCP also describes Metropolitan's procedures for conducting an Annual Water Supply and Demand Assessment (Annual Assessment) that is required by CWC Section 10632.1 and is to be submitted to the California Department of Water Resources (DWR) on or before July 1 of each year, or within 14 days of receiving final allocations from the State Water Project (SWP), whichever is later.

Metropolitan's WSCP is included as Appendix 4 to its 2025 UWMP which will be submitted to DWR by July 1, 2026. However, this WSCP is created separately from Metropolitan's 2025 UWMP and can be amended, as needed, without amending the UWMP.

Organization of this Document

The WSCP covers the required elements as set forth by CWC Section 10632. Because Metropolitan is a wholesale urban water supplier, elements that pertain only to retail water suppliers are not addressed in this WSCP.[1] The document contains eight sections. Section A.4.1 is an introduction that explains the purpose of the WSCP and provides background on Metropolitan's service area and system. Section A.4.2 is a summary of the water supply analysis and water reliability findings from the 2025 UWMP, pursuant to CWC Section 10635. Section A.4.3 is a description of procedures

[1] WSCP elements that apply specifically to retailer water suppliers are: (1) a description of customer compliance, enforcement, appeal, and exemption procedures for triggered response actions (CWC Section 10632(a)(6)); (2) a description of the cost of compliance with Chapter 3.3 (commencing with Section 365) of Division 1 (CWC Section 10632(a)(8)(c)); and (3) monitoring and reporting requirements and procedures that ensure appropriate data is collected, tracked, and analyzed for purposes of monitoring customer compliance and to meet state reporting requirements (CWC Section 10632(a)(9)).

to conduct and approve the Annual Assessment. Section A.4.4 explains the WSCP's six standard water shortage levels corresponding to progressive ranges of up to 10, 20, 30, 40, 50, and more than 50 percent shortages and describes the WSCP's shortage response actions that align with the defined shortage levels. Section A.4.5 addresses communication protocols and procedures to inform customers, the public, interested parties, and local, regional, and state governments regarding any current or predicted shortages and any resulting shortage response actions. Section A.4.6 is a description of the legal authorities that enable Metropolitan to implement and enforce its shortage response actions. Section A.4.7 is a description of the financial consequences of and responses for drought conditions. Section A.4.8 addresses reevaluation and improvement procedures for monitoring and evaluating the functionality of the WSCP and describes the process to adopt, submit, and amend the WSCP.

A.4.1 Background Information on Metropolitan

Background

Metropolitan is a public agency organized in 1928 by a vote of the electorate of 13 Southern California cities. The agency was enabled by the adoption of the original Metropolitan Water District Act (MWD Act) by the California Legislature "for the purpose of developing, storing, and distributing water for domestic purposes." The MWD Act also allows Metropolitan to sell "surplus water not needed or required for domestic or municipal uses within the district for beneficial purposes." In 1992, the Metropolitan Board of Directors adopted the following mission statement:

> *"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."*

Water used in Southern California comes from several sources. The investments that Metropolitan has made and its ongoing efforts in many different areas coalesce toward its goal of long-term regional water supply reliability. The first function of Metropolitan was building the Colorado River Aqueduct (CRA) to convey water from the Colorado River. Deliveries through the CRA to member agencies began in 1941 and supplemented the local water supplies of the Southern California member cities. In 1960, to meet growing water demands in its service area, Metropolitan contracted with DWR for participation in the SWP, which delivers water to Metropolitan's service area via the California Aqueduct. SWP deliveries began in 1972. Metropolitan currently receives imported water from both of these sources: (1) Colorado River via the CRA, and (2) the SWP via the California Aqueduct. Beyond its core imported supplies from the Colorado River and SWP, Metropolitan actively supports efforts to develop storage and groundwater management programs and to increase conservation, water recycling, groundwater recovery, and seawater desalination projects.

Service Area

Metropolitan's service area covers the Southern California coastal plain. It extends about 200 miles along the Pacific Ocean from the city of Oxnard to the north to the international boundary with Mexico to the south, and it reaches as far as 70 miles inland from the coast. The total area served is approximately 5,200 square miles, and it

includes portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego, and Ventura counties. Table A.4-1 shows that although only 14 percent of the land area of the six Southern California counties is within Metropolitan's service area, approximately 86 percent of the population of those counties resides within Metropolitan's boundaries.

Table A.4-1
January 1, 2025 Area and Population in the Six Counties of Metropolitan's Service Area

County	Total County	In Metropolitan Service Area	Percent in Metropolitan
Land Area (Square Miles)			
Los Angeles County	4,085	1,399	34%
Orange County	796	698	88%
Riverside County	7,303	1,077	15%
San Bernardino County	20,105	239	1%
San Diego County	4,236	1,436	34%
Ventura County	1,855	371	20%
Metropolitan's Service Area	**38,380**	**5,221**	**14%**
Population (Persons)			
Los Angeles County	9,877,000	8,988,000	91%
Orange County	3,175,000	3,175,000	100%
Riverside County	2,496,000	1,949,000	78%
San Bernardino County	2,207,000	876,000	40%
San Diego County	3,330,000	3,186,000	96%
Ventura County	829,000	620,000	75%
Metropolitan's Service Area	**21,914,000**	**18,794,000**	**86%**

Source: State of California, Department of Finance, E-5 County/State Population and Housing Estimates- May 2025 release.

Metropolitan is currently composed of 26 member agencies, including 14 cities, 11 municipal water districts, and one county water authority. Metropolitan is a water wholesaler with no retail customers. It provides treated and untreated water to its member agencies.

Metropolitan's 26 member agencies deliver to their customers a combination of local groundwater, local surface water, recycled water, desalinated seawater, and imported water received from Metropolitan. For some member agencies, Metropolitan supplies all the water used within that agency's service area, while others obtain varying amounts of water from Metropolitan to supplement local supplies. Between 2015 and 2024, Metropolitan has provided between 39 and 53 percent of the municipal, industrial, and agricultural water used in its service area. The remaining water supply comes from local wells, local surface water, recycling, and the city of Los Angeles' aqueducts from the Owens Valley/Mono Basin east of the Sierra Nevada. Member agencies also implement conservation programs that can be considered part of their supplies.

Some member agencies provide retail water service, while others provide water to their local area as wholesalers. Table A.4-2 shows Metropolitan's member agencies and the

type of service that they provide. As shown in the table, 15 member agencies provide retail service to customers, nine provide only wholesale service, and two provide a combination of both. Throughout Metropolitan's service area, approximately 250 retail water suppliers directly serve the population.

Table A.4-2
Metropolitan's Member Agencies and Type of Water Service Provided

Member Agency	Retail or Wholesale
Los Angeles County	
Beverly Hills, City of	Retail
Burbank, City of	Retail
Central Basin Municipal Water District	Wholesale
Compton, City of	Retail
Foothill Municipal Water District	Wholesale
Glendale, City of	Retail
Las Virgenes Municipal Water District	Retail
Long Beach, City of	Retail
Los Angeles, City of	Retail
Pasadena, City of	Retail
San Fernando, City of	Retail
San Marino, City of	Retail
Santa Monica, City of	Retail
Three Valleys Municipal Water District	Wholesale
Torrance, City of	Retail
Upper San Gabriel Valley Municipal Water District	Wholesale
West Basin Municipal Water District	Wholesale
Orange County	
Anaheim, City of	Retail
Fullerton, City of	Retail
Municipal Water District of Orange County	Wholesale
Santa Ana, City of	Retail
Riverside County	
Eastern Municipal Water District	Retail & Wholesale
Western Municipal Water District	Retail & Wholesale
San Bernardino County	
Inland Empire Utilities Agency	Wholesale
San Diego County	
Eastern Municipal Water District	Wholesale
San Diego County Water Authority	Wholesale
Ventura County	
Calleguas Municipal Water District	Wholesale

Reliability Planning

Metropolitan continuously engages in planning for various aspects of its water management, including operations, long-term reliability, and emergency response. These planning efforts include the 1996 Integrated Water Resources Plan (IRP) and its three updates in 2004, 2010, and 2015; the 2020 IRP Regional Needs Assessment; the WSCP; the Water Surplus and Drought Management (WSDM) Plan; the Water Supply Allocation Plan (WSAP); Metropolitan's Emergency Storage Objective; Seismic Risk Assessment and Mitigation Plan; and most recently the Climate Adaptation Master Plan for Water (CAMP4W). Collectively, they provide a policy framework, operating guidelines, and resource targets for Metropolitan to ensure regional water supply reliability.

The IRP is Metropolitan's evolving long-term plan to assure adequate water supplies for Southern California. The first IRP was adopted in 1996 to address the complexity of developing, maintaining and delivering water to meet changing demands in the face of growing challenges. The IRP has been updated several times. In 2021, Metropolitan's IRP Regional Needs Assessment incorporated planning for multiple future scenarios to address an extended range of uncertainty. While Metropolitan coordinates regional supply planning through its inclusive IRP process, Metropolitan's member agencies also conduct their own planning analyses, including their own urban water management plans, and may develop projects independently of Metropolitan.

The WSCP is designed to be consistent with the WSDM Plan and the WSAP described below. Throughout the year, Metropolitan evaluates member agency demands, available water supplies, and existing water storage levels on a monthly basis to determine the appropriate actions identified in the WSDM Plan.

The 1999 WSDM Plan provides policy guidance for managing regional water supplies during surplus and shortage conditions. Similar in concept to the WSCP, the WSDM Plan provides an overall vision for operational supply management and characterizes a flexible sequence of actions to minimize the probability of severe shortages and reduce the likelihood of extreme shortages. WSDM Plan principles guide the specific actions to be taken under WSCP shortage stages (see section A.4.4). Data collection, continual analysis, and monthly reporting processes of WSDM Plan implementation is the basis for Metropolitan's Annual Water Supply Demand Assessment, which has been provided to the state annually since July 2022. The WSDM Plan is included as Attachment A to this WSCP.

The WSAP is Metropolitan's policy and formula for equitably allocating available water supplies to the member agencies during extreme water shortages when Metropolitan determines it is unable to meet all of its demands. The WSAP is included as Attachment B to this WSCP.

Metropolitan's Emergency Storage Objective is the regional planning estimate for emergency storage, which represents the amount of water that Metropolitan would hold in storage for the region in preparation for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California: the CRA, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct. In 2019, Metropolitan and its member agencies completed a process to

update the planning estimate of Metropolitan's Emergency Storage Objective. The emergency storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service.

Beginning January 2020, CWC Section 10632.5 mandates urban water suppliers to include in their UWMP a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. For Metropolitan, this requirement was addressed as part of developing its resilience strategy and is presented in detail in Metropolitan's seismic resiliency reports in Appendix 8 to the 2025 UWMP, which are incorporated herein by reference.

A.4.2. Analysis of Water Supply Reliability

Besides the WSCP, the Urban Water Management Planning Act requires suppliers to conduct two other planning analyses to evaluate supply reliability. The first is a Water Reliability Assessment that compares the total water supply sources available to the water supplier with long-term projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and a drought lasting five consecutive water years. The second is a Drought Risk Assessment that evaluates a drought period that lasts five consecutive water years starting from the year following when the assessment is conducted.

Metropolitan completed its Water Reliability Assessment and Drought Risk Assessment as part of the 2025 UWMP. Through the Water Reliability Assessment, Metropolitan determined that, under the conditions required by the Urban Water Management Planning Act, it has supply capabilities sufficient to meet expected demands from 2030 through 2050 under a single dry-year condition and a period of drought lasting five consecutive water years, as well as in a normal water year hydrologic condition. Metropolitan's near-term Drought Risk Assessment revealed that its supply capabilities are expected to exceed its projected water use for the year 2027. However, estimates of projected water supply and use reveal that there could be a possible shortfall of core supplies in 2026, 2028, 2029, and 2030. This shortfall is largely triggered by the assumed low supply conditions from the SWP under a repeat of the historical condition of 1988 to 1992, which is modeled at eight percent of Table A allocation for 2026, seven percent for 2028, eight percent for 2029, and 13 percent for 2030. Actual supply conditions for the next five years may prove different from historic supply conditions. The WSCP shows Metropolitan's potential shortage response actions if such shortfalls were to happen. The Drought Risk Assessment projected supplies and demands for the years 2026 through 2030 using the driest five-year sequence.

Metropolitan's principal sources of water supplies are the SWP and the Colorado River. Metropolitan receives water delivered from the SWP under State Water Contract provisions, including contracted supplies, use of carryover storage in San Luis Reservoir, and surplus supplies. Metropolitan holds rights to Colorado River water for CRA diversion at Lake Havasu. Water management programs supplement these Colorado River supplies. To secure additional supplies, Metropolitan has groundwater banking partnerships and water transfer and storage arrangements within and outside its service area.

Hydrologic conditions and environmental regulations can have a significant impact on Metropolitan's imported water supply sources. For Metropolitan's SWP supplies, precipitation in California's northern Sierra Nevada during the fall and winter helps replenish storage levels in Lake Oroville, a key SWP facility. The source of Metropolitan's Colorado River supplies is primarily the watersheds of the Upper Colorado River Basin in the states of Colorado, Utah, and Wyoming. Although precipitation is primarily observed in the winter and spring, summer storms are common and can affect water supply conditions. Hydrologic variability, potential climate change, and regulatory risk are embedded in Metropolitan's modeling efforts. Metropolitan's

modeling utilizes historical hydrologic conditions from 1992 to 2021 to simulate expected demands on Metropolitan supplies, as well as capacities and constraints of its storage facilities and supply programs. While potential impacts from climate change remain subject to study and debate, climate change is among the uncertainties that Metropolitan seeks to address through its various planning processes. Metropolitan's 2020 IRP Regional Needs Assessment and Climate Adaptation Master Plan for Water (CAMP4W) further addresses ways to account for and mitigate these uncertainties.

As demonstrated by the findings of both the Water Reliability Assessment and the Drought Risk Assessment, Metropolitan is able to mitigate the challenges posed by hydrologic variability, potential climate change, and regulatory risk on its imported supply sources through the significant storage capabilities it has developed over the last two decades, both dry-year and emergency storage.

A.4.3. Annual Water Supply and Demand Assessment Procedures

As an urban water supplier, Metropolitan is required under CWC Section 10632(a)(2) to prepare and submit an "annual water supply and demand assessment" (Annual Assessment). The Annual Assessment is a determination of Metropolitan's near-term outlook for supplies and demands and how a perceived shortage may relate to WSCP shortage stage response actions in the current calendar year. This determination will be based on known circumstances and information available to Metropolitan at the time of analysis. Beginning in 2022, the Annual Assessment has been required to be submitted by July 1 each year, as mandated by CWC Section 10632.1. CWC Section 10632.1 also states that *"[a]n urban water supplier that relies on imported water from the State Water Project or the Bureau of Reclamation shall submit its annual water supply and demand assessment within 14 days of receiving its final allocations, or by July 1 of each year, whichever is later*." The Annual Assessment and related reporting are to be conducted based on the procedures described in this WSCP. This section describes Metropolitan's procedures for conducting the Annual Assessment, which include: (1) the written decision-making process to determine water supply reliability; and (2) the key data inputs and assessment methodology to evaluate water supply reliability for the current year and one dry year.

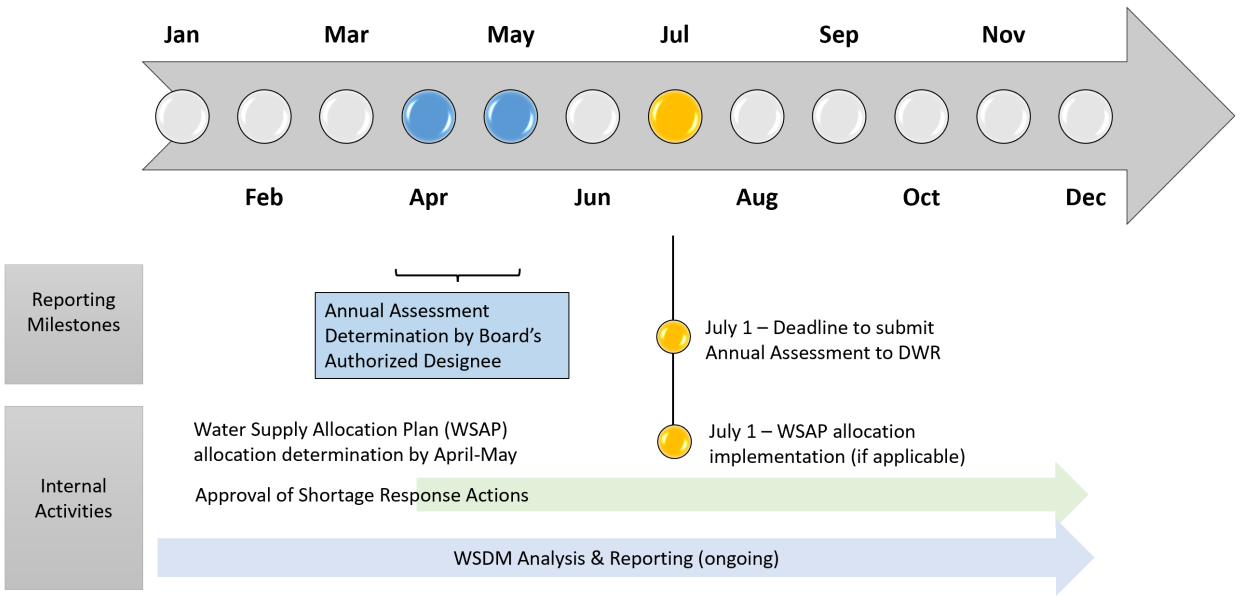
Steps to Approve the Annual Assessment Determination

The Annual Assessment will be primarily based on Metropolitan's ongoing WSDM supply-demand tracking process which is exhibited in reporting to the Board of Directors throughout the year. WSDM planning activities involve examination of developing demand and supply conditions for the calendar year, as well as considerations of potential actions consistent with the WSDM Plan. These analyses provide key information for Metropolitan to manage resources to meet a range of estimated demands and adjust to changing conditions throughout the year.

As a water supply wholesaler, Metropolitan's water demands are a function of retail-level demands and local water production. Water from Metropolitan serves as a supplemental source of supply for its 26 member agencies. For many member agencies, their primary source of water is produced locally from groundwater basins, surface reservoirs, recycled water projects, groundwater recovery projects, and seawater desalination. When local supplies are not enough to meet retail demands, member agencies purchase supplemental water from Metropolitan. Some member agencies rely heavily on Metropolitan due to limited local supplies. As described below, Metropolitan collects estimates of projected consumptive and replenishment water demands from its member agencies. This information is adjusted to determine unconstrained demands for the purpose of the Annual Assessment shortage percentage evaluation.

By June, Metropolitan staff provides a completed Annual Assessment for approval by the Board's authorized designee with expressly delegated authority for approval of Annual Assessment determinations. Upon approval, Metropolitan staff submits the Annual Assessment to DWR by July 1. Figure A.4-1 provides a graphic representation of the decision-making process.

Figure A.4-1
Sample Annual Assessment Decision-Making Timeline



Data Inputs and Assessment Methodology

This section describes how Metropolitan will evaluate water supply reliability for the current year and one dry year for the purpose of the Annual Assessment. The Annual Assessment determination will be based on considerations of available core water supplies, unconstrained water demand, and infrastructure considerations. The difference between core water supplies and unconstrained demand will be used to determine what, if any, shortage stage is expected under the WSCP framework. The standard shortage stage percentage will be calculated by dividing the difference between core supplies and unconstrained demand by unconstrained demand. This calculation will be performed separately for anticipated current-year conditions and for an assumed dry-year condition.

Locally Applicable Evaluation Criteria

Because shortages are based on the difference between expected core supplies and unconstrained demand under current year and dry year conditions, the locally-applicable evaluation criteria to be used in the Annual Assessment for determining a shortage include the following:

- Characterization of current year and dry year scenarios based on best-available data, including anticipated hydrologic conditions for Metropolitan's supply source watersheds in the Colorado River basin and Northern California, as well as for local conditions in Metropolitan's service area in Southern California.

- Estimation of available core supplies (see below) for current year and dry year scenarios
- Estimation of unconstrained demands (see below) for current year and dry year scenarios

Together, these three criteria provide the necessary information to calculate shortage percentages by dividing the difference between core supplies and unconstrained demand by unconstrained demand, under current year and dry year scenarios. These criteria findings will also be given additional context and influenced by infrastructure considerations discussed below which will differ from year to year.

The information and analyses that comprise the Annual Assessment will be based on ongoing planning processes that include WSDM supply-demand reporting. The Annual Assessment represents a mid-year evaluation at a given point in time; even after formal approval and submittal of the Annual Assessment determination by July 1, Metropolitan will continue to monitor emerging supply and demand conditions and take appropriate actions consistent with the flexibility and adaptiveness inherent to this WSCP. Some locally-applicable conditions that affect Metropolitan's wholesale supply and demand, such as the Higher Priority Water Use Adjustment for Colorado River use (see below), local supply production, annual SWP allocations, the status of Metropolitan storage accounts, the status of the local groundwater basins, changed water use practices, and local economic activity entail a high degree of uncertainty and can differ significantly from earlier projections throughout the year.

Description and Quantification of Each Source of Water Supply (Core Supplies)

Metropolitan's core water supplies are counted as the supply component of the Annual Assessment. Core supplies include estimated water supplies from the Colorado River and the SWP for the current year. Imported core supplies vary from year to year and are influenced by annual weather and hydrology, as well as demand by other higher priority users and operational and regulatory factors.

Because core supplies are used every year when available, they are differentiated from the WSCP's shortage response actions for supply augmentation; supply augmentation actions are comprised of Metropolitan's portfolio of water storage reserves and flexible supply sources that are available on an as-needed basis.

Metropolitan's core supplies come from several programs, which are shown in Table A.4-3 and described below.

Table A.4-3
Core Water Supplies

Source	Core Supply
Colorado River	Colorado River Basic Apportionment Higher Priority Water Use Adjustment to Colorado River Basic Apportionment IID/MWD Conservation Program PVID Fallowing Program Quechan Seasonal Fallowing Program Quechan Diversion Forbearance Program Lower Colorado Water Supply Project Exchange with SDCWA Exchange with the United States
State Water Project	MWD SWP Table A SWP Article 21 Interruptible Supplies SWP Port Hueneme Lease of Ventura Table A Desert Water Agency/Coachella Valley Water District/Metropolitan Water Exchange and Advance Delivery Programs

Colorado River

Colorado River Basic Apportionment

Metropolitan built, owns, and operates the 242-mile CRA. The CRA originates at Lake Havasu on the Colorado River and winds through a series of pump stations and reservoirs through the California desert to its terminal reservoir at Lake Mathews in Riverside County. The CRA has a full delivery capacity of 1.25 MAF.

The state of California holds a 4.4 MAF per year normal apportionment to Colorado River water. Metropolitan has the Fourth Priority right to 550,000 AF per year of the State's normal apportionment. Metropolitan also holds the Fifth Priority right to an additional 662,000 AF per year which is utilized during surplus conditions or when supplies from other Colorado River users are available.

Higher Priority Water Use Adjustment to Metropolitan's Colorado River Basic Apportionment

Entitlements to use Colorado River water in California under priorities 1, 2, and 3 are limited to 3.85 MAF per year. Priority 3(a) is held by the Imperial Irrigation District and the Coachella Valley Water District (CVWD), totaling 3.43 MAF. After accounting for contractual conservation and transfers, any unused volume available to Priority 3(a) becomes available for use by Metropolitan. Of the 3.85 MAF, the remaining 420,000 AF is available for use under priorities 1, 2, and 3(b) held by the Palo Verde Irrigation

District and the Yuma Project lands within California. Any unused amount from this volume is available for use by Metropolitan. However, Metropolitan must forego its otherwise available Colorado River supplies to meet priority 1, 2, and 3(b) use that exceeds 420,000 AF. Lastly, there are additional high-priority present perfected rights within California not incorporated into the other priorities, for the sake of which Metropolitan must forego its otherwise available Colorado River supplies if those present perfected uses exceed 14,500 AF. The net sum of these volumes constitutes a higher priority water use adjustment to Metropolitan's base supply.

Imperial Irrigation District-Metropolitan Conservation Program

Since 1988, Metropolitan has funded water conservation programs within Imperial Irrigation District's (IID) service area. The amount of water conserved by these programs is then transferred to Metropolitan. Conservation approaches range from distribution system improvements (such as canal lining, spill capture and the installation of non-leak irrigation gates) to efficient on-farm water management practices (such as delivering water to farmers on a 12-hour rather than a 24-hour basis). Through this program, a total of 105,000 AF per year is conserved and made available to Metropolitan.

Palo Verde Irrigation District Land Management, Crop Rotation, and Water Supply Program

In 2005, Metropolitan entered a 35-year program with the Palo Verde Irrigation District (PVID). Under the program, participating farmers in PVID are paid to reduce their water use by leaving acreage unirrigated. A base amount of 25 percent of the program acreage must be fallowed every year. Metropolitan may elect to call for additional acreage to be fallowed up to 100 percent. Fallowing calls must be made at least one year in advance by July 31 of each year and take effect on August 1 of the following year. The reduced consumptive use due to fallowed lands reduces uses under priorities 1, 2, and 3(b), thereby increasing the Colorado River water supply available to Metropolitan. The fallowing program saves a minimum of 33,000 AF per year and up to 133,000 AF in certain years.

Metropolitan/Quechan Seasonal Fallowing Program

In November 2021, Metropolitan's Board authorized a two-year pilot seasonal fallowing program with the Quechan Tribe (Tribe) of the Fort Yuma Indian Reservation. In November 2023, Metropolitan's Board authorized extending the program to the end of 2026. Under the program, participating farmers on land they lease from the Tribe are paid to reduce their water use by not irrigating a portion of this land. A maximum of 1,600 acres can be fallowed in any given year. It is estimated that the program provides up to 3,500 AF per year of Colorado River water. This water is available in any year as needed and in accordance with the provisions described in the agreements with farmers and the Tribe.

Quechan Diversion Forbearance Program

The Quechan Tribe (Tribe) on the Fort Yuma Indian Reservation (part of the Yuma Project) holds a higher priority water right than Metropolitan. In 2005, Metropolitan

entered into a settlement agreement with the Tribe, under which it is entitled to divert 20,000 AF per year or the amount necessary to supply irrigation and related uses on 2,998.5 acres (whichever is less), in addition to the water the Tribe is entitled to under the 1964 Arizona v. California decree. Of this additional entitlement, 13,000 AF or the amount necessary for irrigation and related uses on 1,949.03 acres became available to the Tribe in 2006 (the remainder will become available in 2035). Metropolitan and the Tribe agreed that if it chooses to limit proposed development and forbear the diversion of any of the additional water, then Metropolitan will provide an incentive payment to the Tribe on the condition that such water is received by Metropolitan. The water supply benefit to Metropolitan is less than the cited 13,000 AF and 7,000 AF volumes since the amounts are diversions and not consumptive use. (A significant portion of the Tribe's additional diversions would pass to Metropolitan as agricultural return flows, even without the agreement.)

Lower Colorado Water Supply Project

Up to 10,000 AF of groundwater is pumped by the Lower Colorado Water Supply Project near the All-American Canal and is discharged to the Canal. IID reduces its net diversions of Colorado River water by an amount equal to the amount of Project water discharged into the Canal, permitting entities along the Colorado River that do not have rights or have insufficient rights to divert Colorado River water to obtain a supply of water. In 2007, Metropolitan entered into a contract with the USBR and the City of Needles to utilize the unused Project capacity.

Exchange with the San Diego County Water Authority (SDCWA)

Through a transfer agreement with IID and by funding the lining of the All-American and Coachella Canals, SDCWA acquired conserved Colorado River water totaling 277,700 AF per year. SDCWA makes this water available at Lake Havasu for Metropolitan to divert. Metropolitan takes possession of the water and provides a matching volume from Metropolitan’s blended supplies to SDCWA by exchange.

Under the transfer agreement with IID, the stabilized annual transfer volume of 200 TAF is generated from conservation of water through on-farm efficiency conservation arrangements made by IID with its customers and other system efficiency measures.

The Coachella Canal Lining Project consists of a 35-mile concrete-lined canal, including siphons, which replaced an earthen canal. The project was completed in December 2006 and conserves 30,850 AF annually. The All-American Canal Lining Project consists of a concrete-lined canal constructed parallel to 23 miles of earthen canal and was completed in 2009, conserving 67,700 AF annually.

Pursuant to the QSA and related agreements, the 98,550 AF of water resulting from these projects annually is allocated as follows: 16,000 AF to the San Luis Rey Settlement Parties in San Diego County, 77,700 AF to SDCWA, and 4,850 AF for the Coachella Canal Lining Project mitigation.

In 2025, following many years of litigation between the parties, SDCWA and Metropolitan entered into a settlement agreement that amended the exchange agreement. Under the terms of the 2025 exchange agreement, SDCWA pays a minimum amount for exchange of 227,000 AF of water from Metropolitan each year at

an agreed-upon exchange price, whether or not SDCWA makes that amount available to Metropolitan for exchange. SDCWA may still exchange up to 277,700 AF with Metropolitan. Monthly deliveries may be variable to meet SDCWA's variable demands. SDCWA may also offer to sell exchange water deliveries to Metropolitan member agencies as a right of first refusal, and Metropolitan has a right of second refusal to buy SDCWA's Colorado River water at Lake Havasu if no member agency purchases exchange deliveries from SDCWA. Any sales of exchange water deliveries by SDCWA to a member agency change only the location of the deliveries, but keep the water within Metropolitan's service area. Additional operational and other conditions apply to the rights of refusal under the 2025 exchange agreement.

Exchange with the United States

The United States furnishes the 16,000 AF allocated to the San Luis Rey Settlement Parties from the All-American and Coachella canal lining projects at Metropolitan's Colorado River Intake on Lake Havasu. Metropolitan takes possession of the water and by exchange delivers an equal volume of Metropolitan's blended supplies to SDCWA. By separate agreement, SDCWA conveys the water to the San Luis Rey Settlement Parties. So long as water conserved by the All-American Canal and Coachella Canal Lining Projects is allocated to, and available for use by, the San Luis Rey Settlement Parties, the United States will make 16,000 AF available for diversion by Metropolitan in perpetuity.

State Water Project

Table A Contract Amount

In accordance with its participation contract with DWR, Metropolitan's maximum contractual amount listed on Table A of the SWP contract is for 1,911,500 AF per year. The amount of supply available on an annual basis is allocated as a percentual of the Table A contractual amount.

DWR estimates the amount of supplies that are available each year based on hydrological conditions, operational and environmental constraints, as well as other obligations. Annual SWP allocations have ranged from 5 percent to 100 percent of the Table A amounts.

Article 21 Interruptible Supplies

Metropolitan has a contract to water supplies that are made available on an intermittent basis. Storm flows can occasionally make water supplies available that are in excess of the Table A allocation. SWP contractors can take delivery of these supplies, with their rights being based on their proportional Table A contract amounts. Historically, Article 21 interruptible supplies have ranged from 0 to 240,000 AF annually.

SWP Port Hueneme Lease of Ventura Table A

Metropolitan has a right to delivery of up to 1,850 AF of Table A supply from the Ventura County Watershed Protection District (Ventura), one of 29 SWP contractors, via a sublease agreement with the Port Hueneme Water Agency (Port Hueneme). United Water Conservation District, one of three agencies holding a contract right to Ventura Table A supply, leases this portion of their total 5,000 AF of Table A supply to Port

Hueneme, which in turn subleases the Table A supply to Metropolitan. The long-term lease is a condition of the 1996 annexation of the Port Hueneme service area to Calleguas Municipal Water District and Metropolitan. This water supply is in addition to Metropolitan's Table A, and the amount available each year is determined by the SWP allocation, with 1,850 AF available at a 100 percent Table A allocation.

Desert Water Agency/Coachella Valley Water District/Metropolitan Water Exchange and Advance Delivery Programs

The Desert Water Agency (DWA) and CVWD, both in Riverside County, have rights to SWP deliveries, but do not have any physical connections to the SWP facilities. Both agencies are adjacent to the CRA. For DWA and CVWD to obtain water equal to their SWP allocations, Metropolitan has agreed to exchange an equal quantity of its Colorado River water for DWA and CVWD's SWP water. DWA has a SWP Table A contract right of 55,750 AF per year, and CVWD has a SWP Table A contract right of 138,350 AF per year, for a total of 194,100 AF per year. Additionally, CVWD has a long-term water supply agreement for 9,500 to 16,500 AF annually from the Rosedale Rio-Bravo Water Storage District.

Under the existing agreements, Metropolitan provides water from its CRA to DWA and CVWD in exchange for SWP deliveries. Metropolitan can deliver additional water to its DWA/CVWD service connections, permitting these agencies to store water. When supplies are needed, Metropolitan can then receive its full Colorado River supply, as well as the SWP allocation from the two agencies, while the two agencies can rely on the stored water to meet their water supply needs. The amount of DWA and CVWD SWP Table A water available to Metropolitan depends on the annual SWP allocation.

Unconstrained Demands

For the purpose of the Annual Assessment and WSCP, CWC Section 10632(a)(2)(B)(i) directs Metropolitan to use current year "unconstrained demand" when assessing water supply reliability. The WSCP and Annual Assessment define unconstrained demand as expected water use in the current assessment year, based on recent water use, and before any projected shortage response actions that may be taken under the WSCP. Unconstrained demand is distinguished from observed demand, which may be constrained by preceding, ongoing, or future actions, such as emergency supply allocations during a multi-year drought. WSCP shortage response actions, if any are in place, that result in extraordinary demand reductions in the current year to constrain demand are inherently extraordinary; routine activities such as ongoing conservation programs and regular operational adjustments are not considered as constraints on demands.

To forecast near-term demands, Metropolitan begins by gathering data from its member agencies. Each July, member agencies submit their five-year demand forecasts to Metropolitan, which serve as the foundation for demand forecasting. Metropolitan then builds upon these projections to develop its own near-term forecast for its internal planning and monthly WSDM supply-demand reporting. This forecast incorporates additional factors, such as historical demand trends, changes in local supply production, weather patterns, water-use efficiency implementation, retail demand estimates, and the latest updates from member agencies.

Because these forecasted demands would be "constrained" observed demands rather than unconstrained demands, Metropolitan will adjust its near-term demand forecast for the Annual Assessment to account for extraordinary demand management measures that Metropolitan may intend or have already put into effect for the current year. Extraordinary demand management measures may include intensified communication and public outreach, and shortage allocations to its member agency customers through implementation of Metropolitan's WSAP. Non-extraordinary water savings from regular conservation and community outreach activities are considered part of Metropolitan's baseline demands and are not counted again for assessments of unconstrained demand.

Water Conditions for Current Year Available Supply Considering Current Year Conditions and One Dry Year

CWC Section 10632(a)(2)(B)(ii) requires the Annual Assessment to determine *"current year available supply, considering hydrological and regulatory conditions in the current year and one dry year."* The Annual Assessment will include two separate estimates of Metropolitan's annual water supply and unconstrained demand using: (1) current year conditions, and (2) assumed dry year conditions. Accordingly, the Annual Assessment's shortage analysis will present separate sets of findings for the current year and dry year scenarios. The CWC does not specify the characteristics of a dry year, allowing discretion to the Supplier. Metropolitan will use this discretion to refine and update its assumptions for a dry year scenario in each Annual Assessment as information becomes available.

In the 2025 UWMP, the "single dry year" is characterized to resemble conditions as a year in which conditions reflect the lowest water supply available to the Supplier. Metropolitan developed estimates of future demands and supplies from local sources and from Metropolitan sources based on 100 years (1922-2021) of historic hydrologic conditions. Supply and demand analyses for the single-dry year case were based on conditions affecting the SWP as this supply availability fluctuates the most among Metropolitan's sources of supply. Based on the 100-year period, 1977 was the single driest year for SWP supplies to Metropolitan. In addition, staff analysis of the 8-River Index indicated that 1977 was the single driest year from 1922 through 2021. The 8-River Index is used by DWR and other water agencies as an estimate of the unimpaired runoff (or natural water production) of the Sacramento and San Joaquin River basins, which are sources of water for the SWP.

Infrastructure Considerations

The Annual Assessment will consider any infrastructure issues that may pertain to near-term water supply reliability, including repairs, construction, and environmental mitigation measures that may temporarily constrain capabilities, as well as any new projects that may add to system capacity.

Metropolitan has five regional water treatment plants, with capacities presented in Table A.4-4. Portions of Metropolitan's service area may receive water treated by one or a combination of several of these water treatment plants. Over the last 40 years, Metropolitan effectively delivered to its member agencies water supplies to meet demands ranging from 1.2 MAF per year to over 2.5 MAF per year.

Table A.4-4
Metropolitan's Water Treatment Plants

Water Treatment Plant	Capacity (in MGD)
Jensen	750
Weymouth	520
Diemer	520
Mills	220
Skinner	350

Note: Rated capacity. Effluent capacities may be less to account for backwash.

In addition to the treatment plants, Metropolitan operates a conveyance and distribution system that is flexible and adaptable allowing delivery of supplies from a combination of SWP, Colorado River, and regional storage sources to meet demands throughout its service area, as shown in Figure A.4-2. However, system distribution capabilities and limitations can add complexity to near-term reliability. For example, a portion of Metropolitan's service area is highly dependent on SWP supplies and can only be delivered limited amounts of Colorado River supplies due to hydraulic constraints in the system.

Extreme drought between 2020 and 2022 resulted in the lowest cumulative three-year total water supply allocation from the SWP. The low allocations required Metropolitan and member agencies to adjust operations and implement measures developed during the previous drought on the SWP, to preserve water for areas in the system that were solely dependent on SWP supplies. Despite the efforts to conserve SWP supplies, in April 2022, Metropolitan's Board approved a resolution declaring a water shortage emergency within the SWP-dependent areas and mandated an emergency water conservation program within those areas. The disparity of impacts from the drought was exacerbated by limitations in the system that restrict the movement of Colorado River water and stored SWP supplies within Diamond Valley Lake and other storage facilities from reaching the SWP-dependent areas.

In August 2022, the Board adopted a resolution affirming Metropolitan's commitment to regional reliability to ensure all member agencies receive equivalent water supply reliability through an interconnected and robust system of supplies, storage, and programs. In response, Metropolitan and its member agencies conducted the SWP Dependent Area Drought Mitigation Workshops to identify drought solutions to prevent a recurrence of the disproportionate effects of the low SWP allocations. The workshops resulted in a proposed Drought Mitigation Action Portfolio.

The Drought Mitigation Action Portfolio recommends projects for implementation to provide timely relief to the SWP-dependent areas in the near term that do not require significant modifications of the existing infrastructure and identifies potential mid-term projects that can be implemented after the removal of system constraints through projects currently in development. The portfolio also provides alternative pathways to

achieve long-term equitable supply reliability for the region through a balanced approach of infrastructure improvements, new storage and supply programs, and local supply development and demand management as directed by the Board.

The recommended drought portfolio is divided into two categories: Category 1 – Cost-Effective Projects for Timely Relief and Category 2 – Projects for Further Consideration. Category 1 projects provide a baseline of improved reliability for the SWP-dependent areas via improved access to existing storage and Colorado River supplies. Category 2 projects have the potential to provide broader drought relief and greater region-wide benefits but would require larger investments, longer implementation periods, and higher implementation risk.

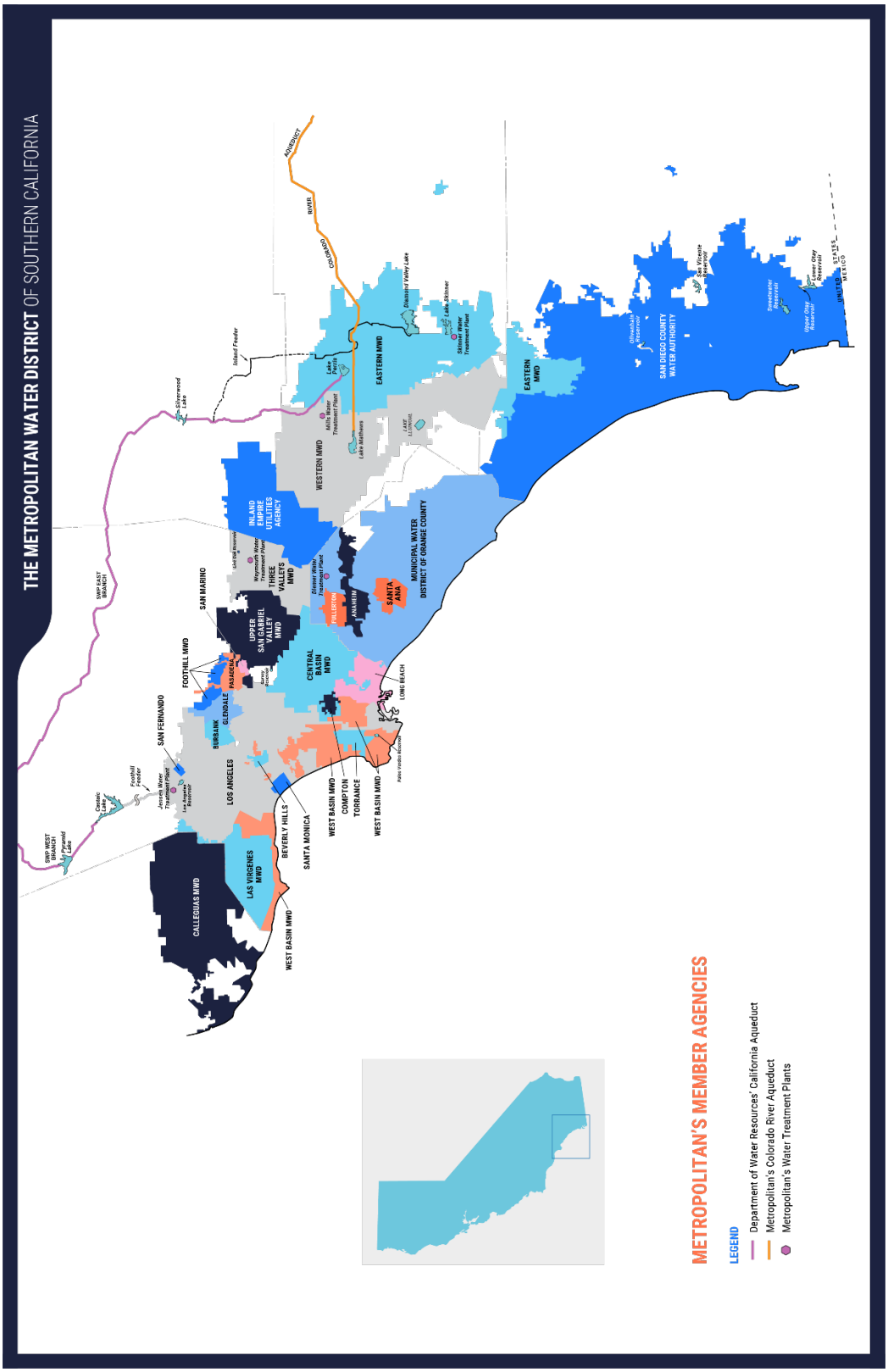
Two of the Category 1 projects are currently being implemented – (1) the DVL to Rialto Project, which will enable delivery of up to 120 cfs of stored SWP supplies in DVL or Colorado River water to Metropolitan's eastern SWP-dependent area serviced by the Rialto Pipeline, and (2) the Sepulveda Feeder Pump Stations Project Stage 1, which will construct two pump stations on the Sepulveda Feeder to deliver up to 30 cfs of treated Colorado River or DVL supplies from Metropolitan's Common Pool area to the western SWP-dependent area. Three other identified Category 1 projects remain in development. These are listed below.

- **Burbank Water and Power Service Connection B-5 to B-5A Shift** – This project would construct a pump station at the Valley Blending Facility to enable Burbank to blend water from the supply side of the Greg Avenue Pump Station called the B-5A Service Connection. The shift from the Service Connection B-5 to B-5A would enable Metropolitan to deliver additional water from the Colorado River that is treated at the Weymouth Plant and pumped by the Greg Ave Pump Station to the western SWP-dependent area.
- **Three Valleys Municipal Water District Miramar Pumpback System Upgrade** – Three Valleys Municipal Water District's Miramar system normally takes water from the Rialto Pipeline and treats it at its Miramar Water Treatment Plant before delivery into its distribution system. The Miramar Pumpback System can take treated water from the F.E. Weymouth Water Treatment Plant (Weymouth Plant) and deliver those supplies to the Miramar system through a series of pumps, offsetting the need for SWP deliveries from the Rialto Pipeline. The Miramar Pumpback System Upgrade project would increase the capacity of the existing system from 15 cfs to 30 cfs.
- **Sepulveda Feeder Pump Stations Project, Stage 2** – This project would expand the Sepulveda Feeder pumping operation to an ultimate capacity of 160 cfs. Stage 1 of the project is being designed to accommodate a future expansion under Stage 2.

The Category 2 projects require greater time for development and larger investment for implementation and are in the planning stage to ensure a thorough and collaborative assessment of their effectiveness, benefits, and risks. Implementation of different Category 2 projects will depend on the outcome of the CAMP4W evaluation, which assesses the effectiveness of different projects in mitigating the long-term supply and demand gaps and providing climate adaptation benefits. This process will allow for a

thorough evaluation considering both the risks and rewards of future investments and apply the adaptive management framework to adjust the implementation plan of drought mitigation actions based on changing conditions.

Figure A.4-2
Metropolitan's Service Area



Throughout each year, Metropolitan regularly carries out preventive and corrective maintenance of its facilities. Metropolitan plans and performs shutdowns to inspect and repair pipelines and facilities and support capital improvement projects. These shutdowns involve a high level of planning and coordination within Metropolitan, as well as with member agencies, other affected organizations, contractors, and the community. These shutdowns are scheduled to ensure that major portions of the distribution system are not out of service at the same time. Operational flexibility within Metropolitan's system and the cooperation of member agencies allow shutdowns to be successfully completed while continuing to meet all system demands.

Metropolitan's Infrastructure Reliability Strategy helps to ensure long-term reliable performance of the system in an efficient and cost-effective manner. Infrastructure reliability is addressed through three programs: the Maintenance Management Program, the Infrastructure Protection Plan, and the Dam Safety Program. The activities performed under these programs allow Metropolitan to extend the life span of its facilities and equipment and improve the overall reliability of the entire conveyance, treatment, and distribution system. In addition, seismic resiliency issues are addressed in the Seismic Risk Assessment and Mitigation Plan, which is included in Appendix 8 to the 2025 UWMP and incorporated herein by reference.

In the event that Metropolitan anticipates that an infrastructure issue is likely to impede or expand Metropolitan's capability to convey, treat, or distribute water during the current year, then the issue would be documented, and the determination of water reliability in the Annual Assessment would be adjusted accordingly.

Other Factors

Water quality is of paramount importance to water supply reliability. Metropolitan owns and operates five water treatment plants. Metropolitan is a national leader in providing safe drinking water that meets increasingly stringent standards, testing for over 400 constituents and performing nearly 250,000 water quality tests annually on samples gathered throughout its distribution system. Metropolitan's Water Quality Laboratory analyzes these samples to ensure that Metropolitan's delivered water meets or surpasses all state and federal drinking water standards. Because treatment to remove specific contaminants can be more costly than measures to protect water at the source, Metropolitan also actively supports improved watershed protection programs for its source waters in the Colorado River and SWP. For the Annual Assessment, any known issues related to water quality will be considered for their potential effects on water supply reliability.

A.4.4. Shortage Levels and Shortage Response Actions

Six Standard Water Shortage Levels

As required by California Water Code Section 10632(a)(3)(A), the WSCP is framed around six standard water shortage levels that correspond to progressive ranges of up to 10, 20, 30, 40, and 50 percent shortages and greater than 50 percent shortages. As shown in Table A.4-5, each of the six shortage levels represents an increasing gap between Metropolitan's estimated core supplies and unconstrained demand as determined in the Annual Assessment. As explained above, shortage percentages will be calculated by dividing the difference between core supplies and unconstrained demand by unconstrained demand. This calculation will be performed separately for anticipated current-year conditions and for assumed dry-year conditions. Shortage levels also apply to catastrophic interruption of water supplies, including, but not limited to, a regional power outage, an earthquake, and other emergency events. The shortage levels are defined in terms of the percent shortfall of supplies against demands.

Shortage Response Actions

California Water Code Section 10632(a)(4) requires the WSCP to specify shortage response actions that align with the defined shortage levels, and include, at a minimum, all of the following:

- Locally appropriate supply augmentation actions
- Locally appropriate demand reduction actions to adequately respond to shortages
- Locally appropriate operational changes
- Additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions (Not applicable to Metropolitan)
- An estimate of the extent to which the gap between supplies and demand will be reduced by implementation of each action.

As indicated in Table A.4-5, shortage responses will be customized to meet the circumstances for the particular shortage. Because circumstances can change at any time, Metropolitan's shortage response actions will be adjusted accordingly throughout the year. To determine specific actions that would be taken at each standard shortage level, Metropolitan will evaluate conditions specific to cost, timing, distribution needs and capabilities, and other variables that include SWP allocation, Colorado River conditions, demand reduction measures, supply program take capacities, and storage balances.

Shortages are characterized not merely by shortfalls in annual core water supplies, but also by the water balances in Metropolitan's storage programs. Thus, a 10 percent shortfall in core supplies could be met entirely with stored water if storage levels are sufficient. If storage levels are already depleted, the same shortfall in core supplies could potentially require a more complex mix of supply augmentation and demand reduction actions. In the most severe situations, shortage allocations to member

agencies through measures such as the WSAP would address any remaining shortages not already mitigated by supply augmentation and lesser demand reduction actions.

Metropolitan has invested extensively in a diverse portfolio of supply sources and system resiliency to prepare for a wide range of possible challenging conditions. Metropolitan follows the principles of its WSDM Plan, which was adopted in 1999 and provides policy guidance for managing regional water supplies to achieve reliability. It identifies a broad sequence of actions during surpluses and shortages to minimize the probability of severe shortages, based on detailed modeling of Metropolitan's existing and expected resource mix. The WSDM Plan recognizes the link between surplus and shortages and integrates planned operational actions with respect to both conditions. The WSDM Plan is included as Attachment A to this document.

Table A.4-5
Shortage Stages and Response Actions

Shortage Stage	Shortage Percentage	Shortage Response	
1	Up to 10%	Take from Storage Execute Flexible Supplies Implement Voluntary Demand Reduction Implement Supply Allocations	• 0 to 100% met by Storage • 0 to 100% met by Flexible Supplies • 0 to 20% of total retail water use met by implementing Communication Plan • 0 to 50% of total base demand met by supply allocation
2	10% to 20%	Take from Storage Execute Flexible Supplies Implement Voluntary Demand Reduction Implement Supply Allocations	• 0 to 100% met by Storage • 0 to 100% met by Flexible Supplies • 0 to 20% of total retail water use met by implementing Communication Plan • 0 to 50% of total base demand met by supply allocation
3	20% to 30%	Take from Storage Execute Flexible Supplies Implement Voluntary Demand Reduction Implement Supply Allocations	• 0 to 100% met by Storage • 0 to 100% met by Flexible Supplies • 0 to 20% of total retail water use met by implementing Communication Plan • 0 to 50% of total base demand met by supply allocation
4	30% to 40%	Take from Storage Execute Flexible Supplies Implement Voluntary Demand Reduction Implement Supply Allocations	• 0 to 100% met by Storage • 0 to 100% met by Flexible Supplies • 0 to 20% of total retail water use met by implementing Communication Plan • 0 to 50% of total base demand met by supply allocation
5	40% to 50%	Take from Storage Execute Flexible Supplies Implement Voluntary Demand Reduction Implement Supply Allocations	• 0 to 100% met by Storage • 0 to 100% met by Flexible Supplies • 0 to 20% of total retail water use met by implementing Communication Plan • 0 to 50% of total base demand met by supply allocation
6	More than 50%	Take from Storage Execute Flexible Supplies Implement Voluntary Demand Reduction Implement Supply Allocations Take from Emergency Storage, if needed	• 0 to 100% met by Storage • 0 to 100% met by Flexible Supplies • 0 to 20% of total retail water use met by implementing Communication Plan • 0 to 50% of total base demand met by supply allocation • Take from emergency storage during a catastrophic event

Supply Augmentation Actions

Generally, Metropolitan's first response to any gap between core supplies and demand is to make optimal use of its supply augmentation options consisting of draws from flexible supply programs and storage reserves listed in Table A.4-6. To supplement its core water supplies from the SWP and Colorado River, Metropolitan has developed and actively manages a portfolio of water supply programs, including water transfer, storage and exchange agreements, the supplies created by which are conveyed through available CRA capacity or the California Aqueduct. Metropolitan pursues voluntary water transfer and exchange programs with other entities to help mitigate supply/demand imbalances and provide additional dry-year supply sources. Metropolitan has also developed significant storage capacity in reservoirs and groundwater banking programs both within and outside of the Southern California region. Actual take capabilities would depend on various factors including water balances, location, and operational constraints.

Flexible Supplies

Metropolitan can augment its core Colorado River supplies through agreements with other agencies that have rights to use such water. Metropolitan determines the delivery schedule of these supplies throughout the year based on changes in the availability of SWP and to a smaller extent the higher priority water use adjustment for Colorado River water.

In addition to the basic SWP contract provisions, Metropolitan has other contract rights that facilitate augmentation of its SWP supply. Each SWP contractor has the right to use the facilities to move water supplies associated with agreements, water transfers, and water exchanges at the incremental cost. Metropolitan utilizes this ability in conveying water obtained through a number of agreements and exchanges with agencies in California's Central Valley, north of the Bay-Delta, and southward to Southern California.

Storage

A key component of Metropolitan's water supply capability is the amount of water in Metropolitan's storage facilities and programs in which surplus amounts of water in normal and wet years are captured until needed to augment core supplies. Metropolitan has developed an extensive storage portfolio made up of units within and outside Metropolitan's service area that includes both dry-year and emergency storage capacity. Such units, totaling approximately 6 MAF, include reservoirs and groundwater storage programs within the service area, and groundwater and surface storage accounts outside the service area delivered through the CRA or SWP. Consistent with the Emergency Storage Objective that was revised in 2019, approximately 750,000 AF of total stored water is emergency storage reserved for use in the event of supply interruptions from earthquakes or similar emergencies.

Table A.4-6
Supply Augmentation Actions: Flexible Supplies and Storage

Source	Flexible Supplies	Storage
Colorado River		Lake Mead Intentionally Created Surplus (ICS) Storage Program Southern Nevada Water Agency Storage and Interstate Release Agreement Desert Water Agency/Coachella Valley Water District Advanced Delivery Account Imperial Irrigation District Storage
State Water Project	SWP Transfers San Bernardino Valley Municipal Water District Program	SWP Carryover DWR Flexible Storage (Castaic Lake and Lake Perris) SWP Banking Programs
In-Region		Diamond Valley Lake Lake Mathews Lake Skinner Conjunctive Use Programs (CUP)

Demand Reduction Actions

Demand reduction actions are extraordinary measures taken to temporarily constrain water demand during a shortage. For the purpose of the WSCP and the Annual Assessment, it is important to separate temporary reductions in demand from baseline conservation as they relate to constrained and unconstrained demands. WSCP demand reduction actions result in constrained demands. Water savings from WSCP demand reduction actions must be factored into estimates of unconstrained demands for Annual Assessment shortage determinations. Intensity of demand reduction measures will vary by the severity of shortage and availability of other cost-effective supply augmentation measures. Early demand reduction actions tend to be voluntary measures that are comprised of outreach and education actions from Metropolitan's WSCP Communication Plan (see following section A.4.5). More severe conditions may necessitate supply allocations to wholesale customers through measures such as the WSAP. Table A.4-7 shows the demand reduction measures available to Metropolitan.

Table A.4-7
Demand Reduction Actions

	Demand Reduction Actions
Voluntary Measures	Implement Communication Plan (May apply to Shortage Levels 1-6, Crisis) • Public information campaigns • Community outreach and media relations • Public opinion research • Interagency and intergovernmental coordination
Mandatory Measures	Implement supply allocation (May apply to Shortage Levels 1-6, Crisis)

Benefits of public information campaigns include rapid implementation and raising public awareness of the severity of the water shortage. For this reason, public information campaigns are included as a Demand Reduction Action in the WSCP. According to the American Water Works Association, water savings from this measure alone range from 5 to 20 percent, depending on the time, money, and effort spent.[2] If public outreach targets between 5 and 10 percent of the population, then demand would be assumed to be reduced by 5 to 20 percent of the 5 to 10 percent. The size of the media campaign is correlated with the number of people being reached.

Implement Communications Plan

Metropolitan's WSCP Communication Plan details Metropolitan's action-oriented strategy for education, outreach, and coordination during each WSCP standard shortage stage and in response to a catastrophic loss of supply. See the following section A.4.5 for the WSCP Communications Plan.

Enhanced Conservation Program

Although not considered as a WSCP demand reduction action because of their limited effect in the immediate term, Metropolitan administers regional conservation programs and co-funds member agency conservation programs designed to achieve greater water use efficiency in residential, commercial, industrial, institutional, and landscape uses. Metropolitan may implement extraordinary measures to temporarily enhance conservation during a shortage which include, but are not limited to, increasing rebates, reducing program eligibility requirements, working with rebate vendors to create in-store marketing and direct outreach to businesses, increasing direct install efforts with member agencies and partners, and working with water retailers and retail customers to develop on-site leak prevention programs. While the savings from conservation programs may not be realized quickly enough to mitigate the need for other shortage response actions, water-efficient device retrofit rebates, landscape conversions, and leak prevention all contribute to ongoing structural water savings. Conservation device

[2] American Water Works Association. 2019. Manual of Water Supply Practices – M60, Second Edition: Drought Preparedness and Response. p. 35

retrofits help to recover storage in future years by lowering demands in all years, not only shortage years.

Water Supply Allocation Plan

Under most conditions, Metropolitan can meet all of its service area's wholesale water needs. However, during severe water shortage situations when public information campaigns and enhanced conservation programs are insufficient to generate the needed demand reduction, Metropolitan may find it necessary to temporarily limit and allocate supplies to its member agencies. Metropolitan's WSAP allocates Metropolitan's water supplies among its member agencies, based on the principles contained in the WSDM Plan, to mitigate drawdowns from water storage reserves. The WSAP was originally approved by Metropolitan's Board in February 2008 and has been implemented three times since its adoption, most recently in April 2015. The WSAP provides a formula for equitable distribution of limited water supplies. If needed, a WSAP action is typically considered for Board approval in the month of April, with implementation beginning in the following July. This allows Metropolitan's member agencies time to prepare and to adjust their estimates for Metropolitan's current year supply for their own WSCP Annual Assessments.

The WSAP allocation is a costly shortage response action that places acute burdens upon member agencies and the public. Other shortage response actions are generally preferred to the extent practicable. Metropolitan's overall strategy considers WSAP allocations to be a fallback option to address any remaining shortages when supply augmentation actions and other demand management measures are insufficient to meet demand reduction objectives. For reference, the WSAP is included as Attachment B to this document.

Emergency Water Conservation Program

In April 2022, Metropolitan's Board declared a Water Shortage Emergency Condition for Metropolitan's SWP-dependent area and adopted a framework for a new program called the Emergency Water Conservation Program (EWCP). The EWCP preserved supplies by reducing non-essential uses of water delivered to the SWP-dependent area. Six member agencies were affected by the EWCP in 2022, serving approximately six million people. The EWCP began implementation on June 1, 2022, and was authorized through June 30, 2023. The EWCP allowed two paths for compliance involving either enforced restrictions on outdoor watering or adherence to the volumetric limits subject to monetary penalties per acre-feet for using SWP water over the limits. The first compliance path required member agencies to restrict outdoor irrigation to one day per week beginning June 1, 2022. The second path gave member agencies discretion to comply with monthly volumetric limits directly and to tailor their water management responses appropriately to their local circumstances. Due to improved water supply conditions in 2023, the EWCP was rescinded in March 2023.

Operational Changes

During shortage conditions, operations may be affected by supply augmentation or demand reduction responses. For example, Metropolitan may temporarily alter maintenance cycles, defer planned system outages, and adjust the flow and routing of

water through its system to more effectively distribute available supply across the service area, including areas that are currently only able to be served by SWP water supplies.

Because of the extensive and complex nature of Metropolitan's conveyance and distribution system and the varying levels of local supplies available among each of the member agencies, any supply-related shortage response actions triggered under the WSCP would be carefully chosen to optimally match available resources with specific localized demands by the member agencies.

Metropolitan's diversified portfolio of water supplies presents operational opportunities and challenges during droughts. Because water resources available to the Metropolitan service area come from three geographically distinct regions – Northern California, the Colorado River, and local resources – a relatively dry year affecting one of these three regions can be offset by relatively abundant supplies from the other two regions. For example, a year of ample precipitation within Metropolitan's service area tends to depress demand and enhances local water resources, further reducing demands on imported supplies. A wet year in the Sacramento-San Joaquin watersheds increases the SWP allocation, facilitating reduced diversions from the Colorado River in favor of storing supplies in Lake Mead or in the Desert Water Agency/Coachella Valley Water District Advanced Delivery Account. Conversely, a shortfall on the SWP may require system operational modifications to maximize Colorado River diversions and the delivery of Colorado River supplies to areas normally served with SWP supplies.

Additional Mandatory Prohibitions (not applicable)

California Water Code Section 10632(a)(4)(D) calls for "additional, mandatory prohibitions against specific water use practices that are in addition to state-mandated prohibitions and appropriate to the local conditions" to be included among the WSCP's shortage response actions. However, this item is not applicable to Metropolitan. As a regional wholesaler, Metropolitan does not dictate or control the end uses of water by retail consumers.

Shortage Response Action Effectiveness

As shown in Table A.4-5, WSCP shortage response actions will be implemented to reflect the overall conditions facing Metropolitan and the resources available in that given year. Supply augmentation actions consisting of stored water and as-needed flexible supplies are expected to address between 0 to 100 percent of anticipated shortages for any shortage stage, depending on availability of those supplies; in lesser WSCP shortage stages, it is likely that shortages can be completely addressed through supply augmentation.

Efficacy of demand reduction efforts is difficult to estimate or predict, but water savings are a function of the extent to which public information campaigns reach water users and the degree of consumer response to those messages. Given the estimate of between 5 to 20 percent effectiveness described above, in concept, up to 20 percent of retail demands could be reduced if a successful media campaign reached and influenced the entire service area population. Consistent with the WSCP Communications Plan in the following section A.4.5, anticipated shortages will involve

an appropriately-sized outreach campaign to address the targeted demand reduction, which depends on the combined effectiveness of other shortage response actions.

As shown in Table A.4-8 below, the WSAP is designed to reduce wholesale demands by up to approximately 50 percent of the WSAP's calculated base demand. The WSAP contains 10 levels of allocation, and each level is approximated to generate an additional 5 percent reduction from base demands. Table A.4-8 gives examples of estimated savings by each WSAP level using a hypothetical base demand of 1.8 MAF. Actual reductions and base demands are based on a formula that includes various factors such as actual local supply production, population growth, and conservation. The WSAP is expected to address the shortage not met by other shortage response actions. In rare cases where system supplies are unable to meet location-specific demands, such as in 2022-2023, when there was insufficient SWP system water to meet SWP-dependent demands, a region-wide allocation through the WSAP may not be appropriate. In such cases, Metropolitan may consider other measures, such as the EWCP, to address the specific problem.

Table A.4-8
Water Supply Allocation Plan Levels

WSAP Level	Approximate Percent Reduction	Example Base Demand	Estimated Demand Reduction
1	5%	1.8 MAF	90,000 AF
2	10%		180,000 AF
3	15%		270,000 AF
4	20%		360,000 AF
5	25%		450,000 AF
6	30%		540,000 AF
7	35%		630,000 AF
8	40%		720,000 AF
9	45%		810,000 AF
10	50%		900,000 AF

Catastrophic Interruption of Water Supplies

Metropolitan's Emergency Storage Objective is a planning estimate that represents the amount of water that Metropolitan would hold in storage for the region in preparation for a catastrophic earthquake that would damage the aqueducts that transport imported water supplies to Southern California, including: the Colorado River Aqueduct, both the East and West branches of the California Aqueduct, and the Los Angeles Aqueduct. Emergency storage allows Metropolitan to deliver reserve supplies to the member agencies to supplement local production. This helps avoid severe water shortages during periods when the imported water aqueducts may be out of service.

The Emergency Storage Objective considers a six- and twelve-month outage period for the imported supply aqueducts incorporating latest seismic information and operational

flexibility of Metropolitan's system, a retail water demand cutback ranging from 25 to 35 percent considering the level of conservation that the region achieved during the recent drought, and an aggregated loss of 10 to 20 percent of local supplies accounting for factors that could affect local production during emergency conditions.

In 2019, Metropolitan and its member agencies completed a process to update the Emergency Storage Objective, which was set at 750,000 AF. This level of storage would prevent severe water shortages to the region given new information on expected recovery durations. The emergency storage volume represents a planning estimate for how much water Metropolitan would store for the region in preparation for a catastrophic earthquake or other disaster. It is not intended to set a basis or a policy for allocating or apportioning storage for any individual member agency.

As an additional tool, in July 2019, the Board adopted amendments to Metropolitan's Administrative Code enabling deliveries of member agency water supplies in Metropolitan's system in an emergency. These deliveries are intended to provide Metropolitan's member agencies the ability to deliver member agency water through Metropolitan's system under specific emergency conditions. Emergency deliveries can only be made if Metropolitan is unable to make deliveries to a member agency due to physical damage to Metropolitan's system resulting from a natural disaster or other emergency, and there are no alternate means for Metropolitan or the member agency to provide service to an area without the use of a portion of Metropolitan's system.

Metropolitan's strategy for catastrophic water shortage conditions is further discussed in Appendix 7 to the 2025 UWMP and incorporated herein by reference.

Emergency Freshwater Pathway (Sacramento-San Joaquin Delta)

DWR has estimated that in the event of a major earthquake in or near the Delta, water supplies could be interrupted for up to three years, posing a significant and unacceptable risk to the California business economy. A post-event strategy would provide the necessary water supply protections to avert this catastrophe. Such a plan has been coordinated through DWR, the Army Corps of Engineers, USBR, California Office of Emergency Services, Metropolitan, and the State Water Contractors. Additional information on the creation of an emergency freshwater pathway and other actions in the Delta is included in Section 2.5 of the 2025 UWMP and incorporated herein by reference.

Emergency Response Plans

Metropolitan maintains an Emergency Response Plan (ERP) that meets the requirements of the American Water Infrastructure Act of 2018. This plan was certified with the Environment Protection Agency (EPA) in 2019, and it was certified again in September 2025. The ERP is updated periodically and provides guidance on how Metropolitan activates and operates its Emergency Operations Center (EOC), Incident Command Posts (ICPs) and Duty Officer program. Metropolitan's EOC follows the Standardized Emergency Management System (SEMS) model, and the ICPs use the Incident Command System (ICS) to manage local incident responses. The plan utilizes a multi-hazard approach and provides a strategy for various types of incidents. The plan

also includes coordination with outside jurisdictions such as other utilities, cities, counties, state and federal governments.

Seismic Risk Assessment and Mitigation Plan

CWC Section 10632.5 mandates UWMPs to include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities. For Metropolitan, the required assessment and plan are accomplished as part of developing its resilience strategy and are presented in detail in its seismic resiliency reports. This section provides a summary of the various components of Metropolitan's resilience strategy. These components are described in detail in Metropolitan's Seismic Resilience Report First Biennial Report (February 2018) and subsequent updates in 2020 and 2025.

Over its nearly 100-year history, Metropolitan has been proactive in mitigating seismic risks posed to its expansive infrastructure, as well as improving its ability to maintain (or quickly restore) water deliveries following a major earthquake. This ability to mitigate seismic risks and maintain (or quickly restore) water deliveries following a seismic event is referred to as "seismic resilience." Metropolitan's holistic strategy for seismic resilience follows a "defense in depth" multi-layered approach for managing risk. Metropolitan's Seismic Resilience Strategy has three primary objectives:

1. Provide a diversified water supply portfolio, system flexibility, and emergency storage
2. Prevent damage to water delivery infrastructure in probable seismic events and limit damage in extreme events
3. Minimize water delivery interruptions through a dedicated emergency response and recovery organization

Metropolitan's Seismic Resilience Strategy is implemented through four components that encompass the various internal functions that promote Metropolitan's seismic resilience objectives. These components are supplemented by Metropolitan's commitment to inter-agency coordination when preparing and responding to a seismic event and other emergencies.

A.4.5. WSCP Communications Plan

Introduction

From 2020 to 2025, extreme swings in hydrologic conditions were driven by a rapidly changing climate and increasingly unpredictable weather patterns. Metropolitan concentrated on building its conservation and outreach program to emphasize sustained efficiency while celebrating the remarkable water-saving achievements accomplished throughout the region. Messaging has encouraged sustainable, long-term behavioral changes, particularly with regard to outdoor water use. These efforts have helped solidify a conservation ethic across Southern California, supporting a $1.7 billion investment in conservation, recycling and groundwater recovery since 1990. When combined with additional investments in storage, local supply development, and system flexibility, the region is well positioned to withstand future droughts. Still, in response to the challenges of climate change and other adverse supply conditions, increased water

efficiency remains a critical strategy. As those extreme conditions become more prevalent, effective communication strategies and a common understanding of necessary actions between water agencies, the public, elected officials, and other key stakeholders become even more important. These relationships and communication tools must be well established to be successful. To that end, water providers should aim to communicate to customers in the following areas:

1. Actions water providers are taking to plan for and respond to emergency situations – including drought, infrastructure failures, earthquakes, wildfires, and other natural or manmade disasters.
2. Ongoing investments to maintain and upgrade critical infrastructure – to increase resilience, reliability, and flexibility.
3. Status of regional water supply conditions and triggers for WSCP shortage response actions – so customers understand the "why" between critical conservation actions.
4. Where customers can go for updates and reliable information during a water emergency – including websites, social media, hotlines, and community alert systems.

Several factors influence the strategies needed to effectively communicate with the diverse communities and needs of Metropolitan's 5,200 square-mile service area, particularly when there is an urgent need for conservation. As a wholesaler serving 26 member agencies and a region that is home to nearly 19 million people, there is no single communication message or strategy that will effectively reach Metropolitan's diverse audiences. Furthermore, state and local water regulations during periods of drought or supply shortages can result in a broad range of water-saving requirements and goals across the region. Qualitative research from previous droughts has provided valuable insight on attitudes and behaviors toward water conservation, including drought fatigue, water quality concerns, increasing water rates and equity issues. These factors, though inherently complex, are conducive to collaboration that elevates the importance of drought resiliency. This section of the WSCP describes the basic communications strategies needed to help Metropolitan effectively communicate vital information for each of the six standard water shortage levels that represent changes from normal reliability. The six standard water shortage levels depicted in this communications plan correspond to progressively increasing estimated shortage conditions: up to 10, 20, 30, 40, 50, and greater than 50 percent shortage compared to the normal reliability conditions.

Collaboration

Collaboration with its member agencies is central to Metropolitan's outreach plans during drought, water shortages or other demand management periods. Developing and delivering a concise regional message in multiple languages is made possible through consistent coordination with member agencies and their constituents. Metropolitan's External Affairs group regularly engages and interacts with member agency staff in several capacities, including but not limited to the following groups:

- Member agency managers

- Legislative and government affairs representatives
- Water use efficiency/conservation coordinators
- Public information officers
- Education coordinators

In addition to member agency coordination, Metropolitan interacts with agencies and organizations outside of the region, including:

- Department of Water Resources
- State Water Resources Control Board
- Association of California Water Agencies
- California Municipal Utilities Association
- Colorado River Water Users Association
- California Water Efficiency Partnership
- Alliance for Water Efficiency
- Law enforcement and public safety agencies
- Other state and federal agencies

As seen in past droughts, the methods of communication within these groups and the frequency of meetings fluctuate based on the changing needs of our member agencies and their key audiences. Water shortage conditions are ever-evolving—remaining flexible yet focused not only reduces the risk of discordance, but it also ensures key audiences throughout Southern California receive timely, valuable, and cohesive information.

As mentioned, Metropolitan's WSCP includes six levels of potential shortage. The water-saving actions associated with each level of shortage will vary greatly. This section provides an overview of messaging strategies that would be enacted at each level, leading to more focused crisis communication strategies. This plan is adaptable and should be tailored for the needs of each situation. Metropolitan management and/or Board of Directors could also call for specific messaging strategies that address unique shortage scenarios.

Key Audiences

Communicating to stakeholders is essential during normal supply periods and becomes increasingly important during water shortages. Below is a list of key audiences:

- Metropolitan Board
- Metropolitan employees
- Member agencies and their customers
- General public
- State, federal, and local elected officials and their district office staff

- Homeowners and renters
- Multi-family property owners/managers/landlords
- Business associations/chambers of commerce
- Commercial-industrial property owners/managers
- Landscape contractors/suppliers
- Restaurant/hotel industries
- School districts/educators/students
- Building and construction trade associations
- Community/civic leaders
- Land-use agencies
- Environmental groups
- Community-based and non-profit organizations
- Non-English-speaking populations
- Disadvantaged/under-invested communities

Communicating to these audiences requires varying levels of involvement depending on the status of supply conditions. Feedback, research, and leveraging existing relationships are central to an effective communications plan; therefore, Metropolitan's External Affairs and Water Resource Management staff will continue to coordinate closely with member agencies, stakeholders, and governing agencies on an ongoing basis to ensure appropriate messaging is culturally competent and provided in multiple languages to reflect the region's demographics.

Goals and Objectives

Metropolitan's communications goals are rooted in the following guiding principles:

- Motivate key audiences to:
    - Increase conservation
    - Follow voluntary or mandatory water use guidelines
    - Participate in water-saving incentive programs
    - Encourage family, friends, neighbors, and colleagues to do all the above
- Raise awareness about:
    - Water shortage and/or drought conditions
    - Water sources, supplies, and reserves
    - Local, regional, and state regulations

- Educate key audiences on:
    - Water supply reliability
    - Water infrastructure and delivery
    - Water quality
- Prepare the region for:
    - Varying water supply conditions
    - Escalating supply shortage levels

Standard Communication

Conservation as a way of life remains central to messaging during normal supply conditions. Regional rebate programs, indoor and outdoor water use efficiency, investments to maintain infrastructure, emergency preparedness, local supply programs, water quality, and regional supply reliability are among some of the themes that make up a normal supply period's communications mix to encourage ongoing conservation actions. Below are Metropolitan's communications tools:

- Media relations (news releases and advisories, interviews, op-eds)
- Social media (X, Instagram, Facebook, YouTube, LinkedIn)
- Websites and Blogs
    - mwdh2o.com
    - bewaterwise.com
    - socalwatersmart.com
- Digital, print, and other paid media marketing
- Search engine optimization
- E-newsletters
- Community events
- Education outreach
- Business outreach

Level 1 Communications – up to 10 percent Shortage

This section addresses the communications strategies Metropolitan uses during periods of up to 10 percent water shortage conditions in addition to Metropolitan's ongoing communications efforts:

- Media relations and communications
    - Maintain media relations activities with enhanced communication about the specific need to conserve; provide media with regional water supply conditions and Metropolitan's shortage response action updates:

        - Press releases, advisories, op-eds, and direct outreach to media to drive earned media opportunities
        - Ethnic media outreach in multiple languages
        - Produce and distribute fact-based informational materials such as fact sheets, podcasts, and B-roll video
- Social media
    - Emphasize ways to conserve immediately (shorter showers, less watering, links to tools on bewaterwise.com, etc.), as well as continued promotion of conservation as a way of life initiatives such as regional water use efficiency incentives and other rebate programs, including Metropolitan's Turf Replacement Program:
        - Paid social media boosting to target the Metropolitan's service area
    - Encourage member agency co-branding and messaging continuity:
        - Share social media creative with the Public Information Officer Working Group and conservation coordinators
- Web
    - Establish a SharePoint site for member agencies and the public to download all water supply and conservation materials
    - Update all Metropolitan websites with pertinent conservation and water supply information
    - Provide links to local watering restrictions and conservation efforts
- Member agency coordination
    - Enhance collaboration and communication with member agencies to streamline messaging
    - Involve member agencies in the development of a communications plan
    - Provide regular campaign updates to member agency managers, staff, and board members
    - Provide member agencies with campaign outreach materials (newsletter articles, creative design, bill inserts, etc.) for customization and distribution
- Community outreach
    - Make water supply conditions and conservation messaging a key component of all regular community outreach
    - Conduct additional, specialized outreach to inform non-profit organizations and civic/community leaders about water supply conditions and conservation efforts
        - Community events/webinars
        - Non-profit organization e-newsletters

- Education outreach
    - Update curriculum to reflect the enhanced need to conserve and make water supply conditions and conservation messaging a key component
    - Communicate to K-12 school districts and colleges/universities about the need for increased conservation
    - Provide regional water and environmental education programs with materials addressing the need for increased conservation
- Legislative and government affairs
    - Promote understanding with local, state, and other elected officials in the region about the need to conserve
    - Encourage officials to promote these efforts to constituents

In addition:

- Regularly communicate with the Metropolitan board and employees so they are aware of how Metropolitan is responding and what they can do to support messaging efforts
- Work with member agencies to target key industries or groups to raise awareness about water-use efficiency programs and regional water supply conditions
    - Restaurants
    - Hotels/motels
    - Public agencies
- Research and public opinion
    - Conduct research to gain insights on public opinion, attitudes and beliefs toward conservation and water shortage levels
    - Message testing with key audiences

Level 2 Communications – up to 20 percent Shortage

In a more severe supply shortage or demand management period, Metropolitan will continue actions outlined in Level 1 communications strategies, and add the following efforts, which are designed to address a shortage condition of up to 20 percent under the WSCP:

- Media relations and communications
    - Paid advertising – Execute a multimedia, multilingual regional advertising campaign to reflect a more urgent message emphasizing the need for compliance with mandatory water-use restrictions. Place paid advertisements in the following platforms:
        - Out of Home (billboards, bulletins, bus shelter ads)
        - Radio

        - Television
        - Digital
        - Grassroots
    - Host a press conference to discuss current water shortage conditions, shortage response actions, and outlook
    - Coordinate with other regional or state agencies for greater impact and reach
- Social media
    - Emphasize a clear and practical message conveying mandatory water-use restrictions, drought conditions, and ways to save water
    - Establish more targeted and focused social media advertising strategies – targeted boosting and messaging
- Member agency coordination
    - Meet with member agencies to streamline a more urgent and serious campaign tone
    - Coordinate paid media flights with member agencies to leverage regional exposure and distribution
    - Provide multimedia and multilingual campaign materials for member agency customization
- Community outreach
    - Coordinate with community-based organizations and leaders with higher impact, reach, and credibility
    - Inform, debrief, and prepare community/civic leaders to become water conservation ambassadors in their respective communities
- Legislative and government affairs
    - Increase briefing activity with state and local officials on water supply conditions, shortage response actions, and water conservation advertising campaign

In addition:

- Help prepare and distribute materials about restrictions, ordinances, and guidelines through stakeholder communication channels, including but not limited to:
    - Business organizations
    - Civic organizations
    - Elected officials
    - Building/plumbing/construction associations

  - Building managers
  - Landscape contractors
- Increase outreach efforts to key associations and interest groups throughout the region, emphasizing immediate conservation goals

Level 3 and 4 Communications – up to 30 percent or 40 percent Shortage

In addition to Level 2 communications strategies, the following efforts will address an even more severe shortage of up to 40 percent under the WSCP:

- Media relations and communications
  - Increase media relations activities, with an added emphasis on the severe regional water supply conditions, the shortage response actions triggered or expected to be triggered, and the mandatory need to conserve
  - Host news conference in multiple languages alongside high-level public officials to highlight severity and extreme measures needed
  - Continue the following with greater frequency and stronger, more critical messaging:
    - Paid advertising campaign
    - Press releases, advisories, op-eds, etc.
    - Direct media outreach offering pre-recorded radio and TV interviews
    - Ethnic media outreach in multiple languages
- Social media
  - Messaging shift to reflect severity of supply conditions and shortage response actions triggered or expected to be triggered– conservation is mandatory to maintain day-to-day activity and future supplies, quality of life now being impacted
- Web
  - Make conservation messaging front and center on all websites
- Community Outreach
  - Host a community leader briefing, bringing together representatives from community-based organizations from across the region to learn about the severity of water supply conditions
- Member agency coordination
  - Continue to streamline messaging about WSCP level escalation to ensure message continuity throughout the region
  - Help member agencies address local and mandatory conservation needs
  - Coordinate with member agencies on any updated messages and campaign activities emphasizing extreme actions that must be taken

- Legislative and government affairs
    - Outreach to legislative leadership at state and federal level to raise awareness at high levels

In addition:

- Specialized targeted outreach to:
    - Special interest groups
    - Public agencies
    - County and city departments
- Assess the goals and objectives of regional rebate programs, begin a shift toward immediate water-saving actions
- Research and public opinion
    - Conduct public opinion research studies including focus groups to determine attitudes and beliefs toward extreme conservation levels to effectively communicate severity of supply conditions and the mandatory need to conserve

Level 5-6 Communications – 50 percent Shortage or more

The severity of this level of the WSCP calls for immediate, extreme conservation measures, and a focus on water use for health and safety only. As with previous levels, communications strategies at this level of the WSCP incorporate and build upon ongoing efforts.

Key Communications Strategies

- Consider establishing a Joint Information Center (JIC) to pool crisis communications among emergency responders and affected local, state, and federal agencies
- Consider hosting employee town halls to provide updates on the situation
- Produce and distribute fact-based informational materials such as fact sheets, podcasts, and B-roll video
- Host a press conference to announce the severity of water shortage level and shortage response actions triggered or anticipated to be triggered, in conjunction with regional and/or state emergency response and public health authorities
- Emphasize work being done by Metropolitan and its member agencies to alleviate the impacts of such a severe shortage
- Focus on the need for residential and commercial customers across the region to do their part to get through the crisis situation
- Offer vulnerable populations increased assistance, in coordination with regional emergency response teams

- Keep the media and key stakeholders informed with frequent supply condition reports
- Shift from traditional advertising campaign efforts to emergency and crisis communication approach
- Messaging is no longer conservation-focused, begin shift to crisis response communications protocols

Crisis Communications – Catastrophic Shortage

In the event of a catastrophic shortage due to an infrastructure failure and/or natural disaster, Metropolitan will enact its crisis communications plan in accordance with local, regional, state, and federal emergency response guidelines that ensure a coordinated effort and effective response. This plan utilizes the Standard Emergency Management System, the Incident Command System and the National Incident Management System.

Strategic Message Development

In an emergency, communications messages will be created in a complex environment in which the tensions of multidirectional information flows must be balanced with the need for strategic message development.

Message Dissemination

Communication efforts will center on the core identified tasks: providing information to the public and external audiences. Information dissemination tools include:

- Website (mwdh2o.com, bewaterwise.com)
- Social Media (X, Facebook, Instagram, YouTube)
- MetAlert Emergency Notification System + RSS Feeds
- Internal memos to the workforce
- Press Releases and statements
- Participation in joint information centers
- For localized emergencies: community bulletin boards, NextDoor

Information Dissemination

- Public Information
    - Activate and manage the mechanisms for responding to public requests for information via social media, telephone, in writing, or by e-mail
    - Prepare Metropolitan's telephone operators for responding to and monitoring calls related to emergency incidents; brief them and provide scripts on how to respond to questions and where to direct calls for other requests
    - Respond to media inquiries and prepare subject matter experts to participate in media interviews and press conferences

  - Monitor news media and work with editors/producers to correct any inaccuracies, as necessary
  - Work with subject matter experts to create situation-specific talking points, fact sheets, Q&A documents, and updates
  - Respond to requests and inquiries from special interest groups
  - Oversee and manage Metropolitan's emergency response website if needed, in addition to mwdh2o.com, social media, telephone, and public email correspondence response systems; establish and maintain links to other emergency response websites
  - Manage the development and testing of messages and materials for cultural and language requirements of special populations
  - Post updates on social media channels. Monitor and respond to comments as needed/appropriate
- Member agencies, partnering agencies, and elected/legislative officials
  - The Public Information Officer (PIO) or Crisis Communications Team will communicate, as needed, with the PIOs for member agencies and other partnering agencies
  - Help organize and facilitate official meetings and briefings to provide information and receive input from member agencies, other partners, or stakeholders
  - Notify legislative/elected officials as needed

A.4.6. Legal Authorities

This section describes the legal authorities that empower Metropolitan to implement and enforce its shortage response actions. Metropolitan is a wholesale water provider organized as a cooperative of 26 voluntary members. Metropolitan was formed pursuant to the Metropolitan Water District Act, Statutes 1969, chapter 209, as amended, codified at California Water Code, Appendix Section 109 (the "MWD Act"). Pursuant to the MWD Act, Metropolitan has the express and implied statutory authority to "[p]rovide, sell, and deliver water at wholesale for municipal and domestic uses and purposes," among other powers. (MWD Act, §§ 120, 130.) To accomplish the provision of water, Metropolitan is also expressly authorized to promote and implement conservation programs, including during times of water shortage. (MWD Act, § 130.5.)

Metropolitan also has authority under the California Water Code to implement supply shortage programs. (Cal. Water Code, §§ 350-359, 375-378.) For example, Section 375(a) of the Water Code provides:

> *Notwithstanding any other provision of the law, any public entity which supplies water at retail or wholesale for the benefit of persons within the service area or area of jurisdiction of the public entity may, by ordinance or resolution adopted by a majority of the members of the governing body after holding a public hearing upon notice and making appropriate findings of necessity for the adoption of a water conservation program, adopt and enforce a water conservation program to reduce the quantity of water used by those persons for the purpose of conserving the water supplies of the public entity.*

Cal. Water Code, § 375(a). Water Code Section 375(b) also provides the authority for pricing to encourage water conservation.

> *With regard to water delivered for other than agricultural uses, the ordinance or resolution may specifically require the installation of water-saving devices that are designed to reduce water consumption. The ordinance or resolution may also encourage water conservation through rate structure design.*

Metropolitan's Board of Directors has approved many policies and rules, codified in Metropolitan's own Administrative Code, which further provide Metropolitan the authority to ensure the availability of its water during times of shortages. For example, Administrative Code Section 3107 requires that any territory annexed to Metropolitan comply with Metropolitan's water use efficiency guidelines.

The Board has also ratified various policies and rules to implement a Water Supply Allocation Plan (WSAP) to address shortage conditions. Metropolitan's WSAP provides a standardized methodology for allocating supplies during times of shortage. The WSAP is authorized pursuant to the following Board actions:

- By Minute Item 43514, dated April 13, 1999, the Board adopted the WSDM Plan.
- By Minute Item 44005, dated June 17, 2000, the General Manager has the authority to reduce Interim Agriculture Water Program deliveries up to 30 percent prior to imposing any mandatory allocation under the WSDM Plan.
- By Minute Item 47393, dated February 12, 2008, the Board adopted the WSAP.

- By Minute Item 48376, dated August 17, 2010, the Board approved adjustments to the WSAP.
- By Minute Item 48803, dated September 12, 2011, the Board approved adjustments to the WSAP.
- By Minute Item 74526, dated February 11, 2014, the Board adopted the Water Supply Alert Resolution.
- By Minute Item 49979, dated December 9, 2014, the Board approved adjustments to the WSAP.
- By Minute Item 52802, dated April 26, 2022, the Board declared a Water Shortage Emergency Condition, authorized the Emergency Water Conservation Program, and expressed support for the Governor's Executive Order N-7-2.
- By Minute Item 52946, dated August 16, 2022, the Board adopted a resolution committing to regional reliability for all member agencies.

In addition to the statutes and other legal authorities set forth above, Metropolitan is empowered to implement and enforce its shortage response actions pursuant to various resolutions. For example, on May 11, 2021, Metropolitan's Board voted to adopt Metropolitan's 2020 UWMP and authorized its submittal to the State of California as stated in Resolution 9279. Metropolitan's 2020 UWMP contains Metropolitan's December 2014 WSAP in Appendix 4. Metropolitan's 2020 UWMP also describes in Section 2.4 Metropolitan's WSAP and WSDM Plan, which guides Metropolitan's planning and operations during both shortage and surplus conditions. Similarly, on May XX, 2026, Metropolitan's Board voted to adopt Metropolitan's UWMP and this WSCP as stated in Resolutions XXXX and XXXX, respectively. These two Resolutions authorize Metropolitan to implement and enforce its shortage response actions contained in the WSCP, which was attached as Appendix 4 to the 2025 UWMP.

Additionally, numerous agreements allow Metropolitan to take its core supplies and shortage response actions. Core supplies and supply augmentation actions are authorized by the agreements shown in 2025 UWMP Appendix 3: Justifications for Supply Projections, which include:

Colorado River Supplies

- 1931 Seven Party Agreement dated August 18, 1931
- Metropolitan's 1930, 1931, and 1946 water delivery contracts with the Secretary of the Interior
- Consolidated Decree of the Supreme Court of the United States in *Arizona v. California*
- 2003 Quantification Settlement Agreement (QSA) and related agreements
- 2005 Settlement Agreement with the Quechan Indian Tribe
- 2007 Colorado River Interim Guidelines for Lower Basin Shortages and the Coordinated Operations for Lake Powell and Lake Mead

- 1988 IID-Metropolitan Conservation and Use of Conserved Water Agreement
    - 1989 Approval Agreement
    - 1989 Supplemental Approval Agreement
- August 2004 Forbearance and Fallowing Program Agreement with PVID
    - Landowner Agreements for Fallowing in PVID
- 2003 Delivery and Exchange Agreement between Metropolitan and Coachella Valley Water District
- 2004 Storage and Interstate Release Agreement among Metropolitan, the Colorado River Commission of Nevada, Southern Nevada Water Authority, and the United States
- 2007 Lower Colorado Water Supply Project Contract among the United States, the City of Needles, and Metropolitan
- 2007 Lower Colorado River Basin Intentionally Created Surplus Forbearance Agreement among the Arizona Department of Water Resources, PVID, IID, the City of Needles, CVWD, Metropolitan, SNWA, and the Colorado River Commission of Nevada
- 2007 California Agreement for the Creation and Delivery of Extraordinary Conservation Intentionally Created Surplus among Metropolitan, PVID, IID, CVWD, and the City of Needles
- 2007 Agreement among the United States, the Colorado River Commission of Nevada, and the SNWA for the Funding and Construction of the Lower Colorado River Drop 2 Storage Reservoir Project
- 2007 Delivery Agreement between the United States and Metropolitan
- 2008 Metropolitan Notice of Election to Participate as a Party to the Drop 2 Funding Agreement
- 2009 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, and the Central Arizona Water Conservation District for a Pilot Project for Operation of the Yuma Desalting Plant
- 2010 Yuma Desalting Plant Pilot Project Delivery Agreement between the United States and Metropolitan
- 2012 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, and the Central Arizona Water Conservation District for a Pilot Program for the Conversion of Intentionally Created Mexican Allocation to Intentionally Created Surplus
- 2012 Interim Operating Agreement for Implementation of Minute No. 319 of the International Boundary and Water Commission
- 2012 Lower Colorado River Basin Forbearance Agreement for Binational Intentionally Created Surplus

- 2012 Binational ICS Delivery Agreement
- 2013 Agreement between Metropolitan and IID Regarding Binational Intentionally Created Surplus
- 2015 Amendment 1 to the California Agreement for the Creation and Delivery of Extraordinary Conservation Intentionally Created Surplus
- 2017 Agreement among the United States, Metropolitan, the Colorado River Commission of Nevada, SNWA, IID, and the Central Arizona Water Conservation District for a Pilot Program for the Conversion of Mexico's Water Reserve to Binational ICS
- 2017 Interim Operating Agreement for Implementation of Minute No. 323
- 2017 Binational ICS Agreement
- 2017 Binational ICS Delivery Agreement
- 2019 Lower Basin Drought Contingency Plan
- December 2021 Agreement for the Implementation of a Pilot Seasonal Land Fallowing Program with the Quechan Indian Tribe of the Fort Yuma Indian Reservation.
    - Agreements for Seasonal Fallowing on Tribe-leased lands (Farmer Fallowing Agreements for the Quechan Pilot)
- December 2023 First Amendment to the Agreement for the Implementation of a Pilot Seasonal Land Fallowing Program with the Quechan Indian Tribe of the Fort Yuma Indian Reservation.
- Agreement Relating to Supplemental Water among The Metropolitan Water District of Southern California, the San Luis Rey Settlement Parties, and the United States
- 2003 Amended and Restated Agreement between The Metropolitan Water District of Southern California and the San Diego County Water Authority for the Exchange of Water.
- 1998 Agreement between Imperial Irrigation District and San Diego County Water Authority for Transfer of Conserved Water.
- 2003 Allocation Agreement among the United States, CVWD, IID, SDCWA, Metropolitan, and the San Luis Rey Settlement Parties.
- 2003 Colorado River Water Delivery Agreement: Federal Quantification Settlement Agreement.

State Water Project Supplies

- 1960 Contract between the State of California and The Metropolitan Water District of Southern California for a Water Supply
- Port Hueneme Water Agency Annexation: By Minute Item 41728, dated January 9, 1996, Metropolitan's Board adopted Resolution 8487 granting the concurrent annexation of Annexation No. 32 to Calleguas Municipal Water District and The

Metropolitan Water District of Southern California, and fixing Metropolitan's terms and conditions for the annexation

- 1996 Sublease Agreement between the Port Hueneme Water Agency and Metropolitan
- 1967 and 1983 Water Exchange Contract and Agreements with Desert Water Agency and Coachella Valley Water District
- 1984 Advance Delivery Agreement with Desert Water Agency and Coachella Valley Water District
- The 2003 Exchange Agreement with Desert Water Agency and Coachella Valley Water District
- November 2012 Letter Agreement with Coachella Valley Water District
- 2019 Amended and Restated Agreement for Exchange and Advance Delivery with Desert Water Agency and Coachella Valley Water District
- 1997 Arvin-Edison/Metropolitan Water Management Agreement
- 1998 Turn-in/out Construction and Maintenance Agreement between DWR, Kern County Water Agency, Arvin-Edison, and Metropolitan
- 1998-2002 Water Delivery and Return Agreements with DWR, Kern County Water Agency, Arvin-Edison, and Metropolitan
- 2004 Point of Delivery Agreement with DWR, Kern County Water Agency, and Metropolitan
- 2004 Introduction of Water into the California Aqueduct with DWR, Kern County Water Agency, and Arvin-Edison
- 2007 First Amended and Restated Agreement Between Arvin-Edison Water Storage District and The Metropolitan Water District of Southern California for a Water Management Program
- 2000 Coordinated Operating Agreement between Metropolitan and San Bernardino Valley Municipal Water District
- 2001 Coordinated Operating Agreement between Metropolitan and San Bernardino Valley Municipal Water District
- 2019 Board Approval of the High Desert Water Bank Agreement with Antelope Valley East Kern Water Agency
- 2001 Kern Delta/Metropolitan Principles of Agreement
- 2002 Kern Delta and Metropolitan Boards of Directors Approval
- 2007 DWR-Yuba County Water Agency Purchase Agreement
- 2007 DWR-Metropolitan Yuba Dry Year Program Participation Agreement
- 2014 Amended DWR-Metropolitan Yuba Dry Year Program Participation Agreement

- 2019 Amended and Restated Agreement Among The Metropolitan Water District of Southern California, Coachella Valley Water District, and Desert Water Agency for the Exchange and Advance Delivery of Water
- 2020 Amended DWR-Metropolitan Yuba Dry Year Program Participation Agreement
- 2021 Coordinated Operating Agreement. The Coordinated Operating Agreement between Metropolitan and San Bernardino Valley District was approved by Metropolitan's Board in March 2021. The agreement will terminate on December 31, 2035 unless there is an extension of the SWP Contract.
- 2026 Amended DWR-Metropolitan Yuba Dry Year Program Participation Agreement

In-Region Storage and Supplies

- November 1974 Memorandum of Understanding and Agreement on Operation of Lake Skinner
- November 1994 Memorandum of Understanding on Operation of Domenigoni Valley Reservoir (now known as Diamond Valley Lake)
- Elderberry Forebay Contract for Conditions for Use
- June 2002 Division of Safety of Dams Certificate of Approval
- October 1991 Final EIR for the Eastside Reservoir Project (Diamond Valley Lake)
- 1995 amendment to Metropolitan's SWP contract to include Article 54, "Usage of Lakes Castaic and Perris"
- November 1974 Memorandum of Understanding and Agreement on Operation of Lake Skinner
- June 2002 Division of Safety of Dams Certificate of Approval
- Principles for groundwater storage adopted by the Metropolitan Board in January 2000
- Resolution for Proposition 13 Funds adopted by the Metropolitan Board in October 2000
- Agreement executed with the DWR for Interim Water Supply Construction Grant Commitment Safe Drinking Water, Clean Water, Watershed Protection and Flood Protection (Proposition 13, Chapter 9, Article 4) providing for Metropolitan to administer $45 million in state Proposition 13 grant funds for groundwater reliability programs; October 2000
- Agreement executed for Chino Basin Programs, June 2003, amended in May 2004, August 2004, August 2005, May 2008, March 2009, September 2009, July 2010, and January 2015
- Agreement executed for Upper Claremont Basin Groundwater Storage Program, September 2005, amended in April 2008
- Agreement executed for Elsinore Basin Conjunctive Use Program, December 2006, amended in May 2008

These agreements are described in more detail in Appendix 3 to Metropolitan's 2025 UWMP.

If necessary, Metropolitan shall declare a water shortage emergency in accordance with CWC Chapter 3 (commencing with Section 350) of Division 1. In addition, Metropolitan shall coordinate with any city or county within which it provides water supply services for the possible proclamation of a local emergency, as defined in Section 8558 of the Government Code.

A.4.7. Financial Consequences of and Responses for Drought Conditions

A water shortage may be created by a reduction in water supply, an increase in water demand, or a combination of both. Metropolitan's shortage response actions include supply augmentation, demand management, and operational flexibility, all of which could impact Metropolitan financially. For example, exercising the options to take water from supply augmentation programs may increase costs. Similarly, operational changes could result in higher system costs and lower revenues from on-system hydropower generation, and an increase in conservation and outreach efforts would also increase costs. On the other hand, if core supplies from the SWP or the Colorado River were reduced, variable power costs to move water into the service area would likely decrease. Additionally, effective demand management during shortages tends to decrease Metropolitan's water sales when effective, thereby potentially reducing revenue for Metropolitan. From these various financial effects, there is a potential for expenditures exceeding revenues more than budgeted, thereby requiring unanticipated draws from reserves.

Variation in the amount of revenues is already part of Metropolitan's financial planning. Revenues vary according to regional weather and the availability of statewide water supplies. In dry years, local demands increase, and Metropolitan may receive higher than anticipated revenues due to increased sales volumes. In contrast, in wet years, demands decrease, and revenues drop due to lower sales volumes. In addition, statewide supply shortages such as those in 2009, 2015, and 2022 also affect Metropolitan's revenues. Such revenue surpluses and shortages could cause instability in water rates. To mitigate this risk, Metropolitan maintains financial reserves, with a minimum and target balance, to stabilize water rates during times of reduced water sales. The reserves hold revenues collected during times of high water sales and are used to offset the need for revenues during times of low sales. Metropolitan's practice of using reserves to buffer unexpected increases or decreases in budgeted revenue also applies to unexpected expenditure increases or decreases resulting from shortage responses.

Metropolitan uses its financial reserves to mitigate the impacts of water shortages. This policy applies to each of the six shortage levels described in this WSCP. Financial reserves create a buffer to reduce the financial impact of the water shortage. Other mitigation actions such as reducing operations and maintenance expenses, deferring capital projects, and rates/charges increases are part of Metropolitan's biennial budget and rate design cycle, are not used routinely to mitigate financial impacts of water shortage response actions.

Metropolitan's reserve policy provides for a minimum reserve requirement and target amount of unrestricted reserves at June 30 of each year. Funds in excess of the target amount are to be utilized for capital expenditures in lieu of the issuance of additional debt, or for the redemption, defeasance or purchase of outstanding bonds or commercial paper as determined by the Board. However, if the fixed charge coverage ratio (the amount necessary to cover all fixed costs) is at or above 1.2, amounts over the minimum may be expended for any lawful purpose of Metropolitan, as determined by the Board. Therefore, unrestricted reserves are intended to be available to address

Metropolitan's shortage response actions, as well as the consequences of those actions, so long as its fixed charge coverage ratio is at or above 1.2.

A.4.8. WSCP Adoption and Refinement Procedures

WSCP Public Notice and Adoption

Metropolitan provided notice of the availability of the draft 2025 UWMP (including Appendix 11) and WSCP, and notice of the public hearing to consider adoption of both plans in accordance with CWC Sections 10621(b) and 10642, and Government Code Section 6066, and Chapter 17.5 (starting with Section 7290) of Division 7 of Title 1 of the Government Code. The public review drafts of the 2025 UWMP and the WSCP were posted prominently on Metropolitan's website, mwdh2o.com, on February 6, 2026, more than 60 days in advance of the public hearing on April 13, 2026. The notice of availability of the documents was sent to Metropolitan's member agencies, as well as to cities and counties in Metropolitan's service area. In addition, a public notice advertising the public hearing in English and Spanish was published in 11 Southern California newspapers. The notification in English language newspapers was published on February 23, 2026 and March 2, 2026. The notification was published on February 23, 26, 27, 2026 and March 2, 5, 6, 2026 in Spanish language newspapers, satisfying the requirement for non-English language notification. Copies of: (1) the notification letter sent to the member agencies, cities and counties in Metropolitan's service area, and (2) the notice published in the newspapers are included in the 2025 UWMP Section 5. Table 5-3 in the 2025 UWMP provides a list of participating member agencies and other appropriate agencies that Metropolitan coordinated with in its regional planning, as well as the cities and counties that were notified about the preparation of its 2025 UWMP and WSCP. In addition, the list of newspaper publications is included in Table 5-4.

Metropolitan held the public hearing for the draft 2025 UWMP and draft WSCP on April 13, 2026, at the Board's One Water and Adaptation Committee meeting. On May XX, 2026, Metropolitan's Board determined that the 2025 UWMP and the WSCP are consistent with the MWD Act and accurately represent the water resources plan for Metropolitan's service area. In addition, Metropolitan's Board determined that Appendix 11 to both the 2015 UWMP and the 2020 UWMP includes all of the elements described in Delta Plan Policy WR P1, Reduce Reliance on the Delta Through Improved Regional Water Self-Reliance (Cal. Code Regs. tit. 23, § 5003) which need to be included in a water supplier's UWMP to support a certification of consistency for a future covered action. As stated in Resolutions XXXX, XXXX, and XXXX, the Board adopted the 2025 UWMP and the WSCP and authorized their submittal to the State of California. Copies of Resolutions XXXX, XXXX, and XXXX are included in the 2025 UWMP Section 5, and Resolution XXXX for the WSCP is attached to this WSCP as Attachment C.

Submission and Availability of 2025 UWMP and WSCP

In fulfillment of CWC Sections 10632(c) and 10645(a) and (b), Metropolitan's final 2025 UWMP and its WSCP were posted on the mwdh2o.com website in May 2026, following their adoption by the Metropolitan board. This satisfies the requirement to make the plans available for public review and to make the WSCP available to Metropolitan's customers (which are its member agencies).

In fulfillment of CWC Sections 10632(c), 10635(c) and 10644(a)(1), Metropolitan also mailed copies of the final 2025 UWMP and WSCP (in electronic pdf format) to the

California State Library and all cities and counties within Metropolitan's service area within 30 days of Board adoption.

In June 2026, in fulfillment of CWC Section 10621(f) and Sections 10644(a)(1), (2), and (b), Metropolitan's final 2025 UWMP and WSCP were electronically submitted to the State of California through DWR's WUE data website https://wuedata.water.ca.gov/secure/.

WSCP Reevaluation and Improvement Procedures

The WSCP will be periodically re-evaluated to ensure that its shortage risk tolerance is adequate and the shortage response actions are effective and up to date based on lessons learned from implementing the WSCP. The WSCP may be revised and updated during the UWMP update cycle to incorporate updated and new information. For example, new supply augmentation actions may be added, and actions that are no longer applicable for reasons such as program expiration may be removed. However, if revisions to the WSCP are warranted before the UWMP is updated, the WSCP will be updated outside of the UWMP update cycle. In the course of preparing the Annual Assessment each year, Metropolitan staff will routinely consider the functionality of the overall WSCP and will prepare recommendations for Metropolitan's Board of Directors if changes are found to be needed.

ATTACHMENTS

Attachment A – Water Surplus and Drought Management Plan

Attachment B – Water Supply Allocation Plan

Attachment C – WSCP Resolution XXXX

ATTACHMENT A

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

WATER SURPLUS AND DROUGHT MANAGEMENT PLAN

REPORT NO. 1150

AUGUST 1999

ACKNOWLEDGMENTS

The consensus reached in the Water Surplus and Drought Management Plan would not have been possible without the dedication and participation of the Rate Refinement Process Workgroup, comprises made by the General Manager, staff from Metropolitan's member agencies, Metropolitan staff, and the dedication and work of the consultants.

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ATTACHMENT A

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ATTACHMENT A

WATER SURPLUS AND DROUGHT MANAGEMENT PLAN

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

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EXECUTIVE SUMMARY

INTRODUCTION

The Water Surplus and Drought Management (WSDM) Plan for the Metropolitan Water District of Southern California (Metropolitan) is a ten-year plan that will be used to direct Metropolitan's resource operations to help attain the region's 100% reliability goal. The WSDM Plan recognizes the interdependence of surplus and shortage actions and is a coordinated plan that utilizes all available resources to maximize supply reliability. The overall objective of the WSDM Plan is to ensure that shortage allocation of Metropolitan's imported water supplies is not required.

The central effort in developing the WSDM Plan was a participatory process involving Metropolitan and its member agencies. Metropolitan staff and member agency representatives coordinated the Plan's development during a series of meetings of the Rate Refinement Team.

To lay a foundation for the WSDM Plan, participants in the Rate Refinement Process developed a set of proposed WSDM Principles and Implementation Goals which were subsequently adopted by the Metropolitan Board of Directors in September 1998. These Principles and Implementation Goals outline fundamental policies for guiding surplus and shortage management and establish a basis for dealing with shortages in an equitable and efficient manner.

WSDM PRINCIPLES AND IMPLEMENTATION GOALS

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 periods of shortage.

Supporting Principles

- Maintain an ongoing coordinated effort among Metropolitan and its Member Agencies to encourage efficient water use, develop cost-effective local resource programs, and inform the public on water supply and reliability issues

- Encourage local and regional storage during periods of surplus and use of storage during periods of shortage

- Manage and operate Metropolitan's regional storage and delivery system in coordination with local facilities to capture and store surplus water in local groundwater and surface reservoirs

- Arrange for secure sources of additional water from outside the region for use during periods of shortage

- 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

WSDM Plan Implementation Goals

- Avoid mandatory import water allocations to the extent practicable

- Equitably allocate imported water on the basis of agencies' needs

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

  - Impact on retail consumers and economy
  - Reclamation/Recycling
  - Conservation
  - Population and economic growth
  - Investment in local resources
  - Change and/or loss of local supply
  - Participation in Metropolitan's Non-firm (interruptible) programs
  - Investment in Metropolitan's facilities

- Encourage storage of surplus supplies to mitigate shortages and improve water quality

SURPLUS AND SHORTAGE ACTIONS

The region's ability to implement a long-term WSDM Plan results from the significant investments Metropolitan and its member agencies have made in a variety of resources since 1991. These additional resources include increased local conservation and water recycling, improvements in the reliability of imported supplies, increased regional storage, and increased conjunctive use groundwater programs. Together these improvements allow a comprehensive approach to water management.

The growing variety of resources available to the region is transforming Metropolitan from an agency with relatively modest storage capacity to one that will have storage sufficient to manage many shortages without impacts to its member agencies or retail customers. To attain this level of reliability, all storage programs and facilities, along with conservation, recycling, and other programs, must be managed as an integrated set of regional resources. To accomplish this, the WSDM Plan establishes the linkage between surplus and shortage resource management actions.

When imported supplies exceed projected demands for imported water within Metropolitan's service area, Metropolitan can operate available storage facilities to maximize the benefits of stored water to its member agencies. A number of factors affect Metropolitan's ability to divert surplus water into storage. Some of these factors include facility outages, system capacity, water quality (including requirements for managing total dissolved solids), and varying supply and demand patterns. The WSDM Plan provides a description of storage options available to Metropolitan and a framework for storing water in these programs and facilities when surplus supplies are available.

Except in severe or extreme shortages (defined in the Introduction) or emergencies, Metropolitan's resource management will allow shortages to be mitigated without impacting retail Municipal and Industrial (M&I) customers. A list of resource management actions and their descriptions are provided

below. This list emphasizes critical storage programs and facilities, and conservation programs that make up part of Metropolitan's response to shortages. The order in which these actions are presented does not imply the exact operational management of resources that would occur during a shortage, rather it represents a general framework and guide. In fact, several actions are likely to be taken concurrently. Many factors will dictate the exact order in which these actions will be taken during shortages. One action, however, will have an assigned prioritization: the curtailment of Full Service (firm) deliveries will be last. The following summarizes the drought actions:

- Draw on storage in the Eastside Reservoir Project
- Draw on out-of-region storage in Semitropic and Arvin-Edison
- Reduce/suspend long-term seasonal and groundwater replenishment deliveries
- Draw on contractual groundwater storage programs in the region
- Draw on State Water Project (SWP) terminal reservoir storage (per Monterey Agreement)
- Call for extraordinary drought conservation and public education
- Reduce Interim Agricultural Water Program (IAWP) deliveries
- Call on water transfer options contracts
- Purchase transfers on the spot market
- Implement the allocation of Metropolitan's imported supplies to its member agencies

For the ten-year period addressed by the WSDM Plan, 1999-2008, the majority of shortage contingencies will be managed by withdrawals from storage, groundwater management and options transfers. Shortages managed using these actions would not impact the quantity of water delivered to member agencies for consumptive uses. In fact, when coupled with other drought actions such as extraordinary conservation and reduction of agricultural deliveries, it is fully expected that an allocation of firm imported water supplies will not be necessary during the next ten years. Under this worse-case scenario, an approach to allocate Metropolitan's firm imported water supplies in a fair and equitable manner will be developed.

The overall policy objective of the allocation method will be to minimize the impacts to any one agency and the region as a whole. To meet that objective, the method of allocating firm imported supply will account for:

- Each agency's demands on Metropolitan,
- Each agency's local resources
- Each agency's total retail demands.

The WSDM Plan allocation method would address each of these supply and demand components and account for each agency's conservation and recycled water programs. A pricing structure will be coupled with the WSDM allocation method to accomplish two goals:

- Encourage conservation and water recycling
- Ensure that the regional impact of the shortage is as small as possible

To provide as much water as possible without changing wholesale prices, the allocation of all available supplies will be made at the prevailing rates for firm deliveries. In order to encourage conservation to the level of allocation, the rate for agency usage from 100-102% of its allocation will be the Full Service rate plus $175. Usage above 102% of allocated supply will be charged at three times the Full Service rate. Any substantial change in Metropolitan's water rate structure may require these rates to be revised.

During severe or extreme shortage conditions, public outreach will play a critical role in shaping consumer response. Public information campaigns will send clear signals if extraordinary drought conservation is required. An effective public information campaign requires a joint effort among Metropolitan and its member agencies. Under this Plan, the administration of the Public Information and Government Affairs program will be the responsibility of a Drought Program Officer (DPO). The DPO will be responsible for integrating the various activities in these areas, coordinating efforts with Metropolitan's Board of Directors and member agencies, and designing the region-wide messages for the general public and various target audiences. Important constituencies are residential users, industrial and institutional users, business interests, agricultural users, elected officials, officials of various agencies such as the Department of Water Resources, and the media.

INTEGRATED RESOURCES MANAGEMENT

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 trader shortage scenarios based on historical hydrologic 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. When do various pieces of information about the supply/demand balance become more certain? When should this information impact policy-making and trigger various resource actions? The WSDM Plan addresses these questions and the actual implementation of the Plan during a shortage.

Appendix A of this report provides a ten-year simulation of projected demands and supplies showing an example of how the region can maintain 100% reliability.

INTRODUCTION

The Metropolitan Water District of Southern California (Metropolitan) provides water to a service area covering approximately 5,200 square miles. Over 16.5 million people live within the service area, which supports a $500 billion economy. Metropolitan provides supplemental supplies to twenty-seven member agencies, both retail and wholesale agencies, who in turn provide water to over three hundred cities and local agencies providing supplies at the retail level. In recent years Metropolitan supplemental deliveries have accounted for about one-half to two-thirds of the region's total water demands. With supplies from its Colorado River Aqueduct (CRA) and the State Water Project (SWP), Metropolitan delivers water for municipal and industrial (M&I) uses, agricultural uses, and augmentation of local storage.

As part of the implementation of the regional Integrated Resources Plan (IRP), Metropolitan and its member agencies have developed the Water Surplus and Drought Management (WSDM) Plan for Southern California. This ten-year plan will direct Metropolitan's resource operations to help attain the region's 100% reliability goal. Over this ten-year period, the WSDM Plan will be updated to account for changes impacting supplies from the Colorado River and California's Bay-Delta. In the past, Metropolitan has developed drought management plans that simply addressed shortage actions and primarily focused on issues of short-term conservation and allocation of imported water. The WSDM Plan recognizes the interdependence of surplus and shortage actions and is a coordinated plan that utilizes all available resources to maximize supply reliability. The overall goal of the WSDM Plan is to ensure that shortage allocation of Metropolitan's imported water supplies is no---At required.

Because it addresses both surplus and shortage contingencies, the WSDM Plans draws clear distinctions among the terms *surplus, shortage, severe shortage,* and *extreme shortage.*

***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 and local facilities for storage.*

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

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

ATTACHMENT A

WSDM PRINCIPLES AND IMPLEMENTATION GOALS

The central effort in developing the WSDM Plan was a participatory process involving Metropolitan and its member agencies. Metropolitan staff and member agency representatives coordinated the Plan's development during a series of meetings of the Rate Refinement Team and the Integrated Resources Planning Workgroup. To lay a foundation for the WSDM Plan, participants in the Rate Refinement Process developed a set of "WSDM Principles and Implementation Goals."

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  - Population and economic growth
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  - Participation in Metropolitan's Non-firm (interruptible) programs
  - Investment in Metropolitan's facilities.

- Encourage storage of surplus supplies to mitigate shortages and improve water quality

REGIONAL RESOURCES AND DEMANDS

Southern California receives its water supplies from a variety of different sources, both local to the region and imported from outside the region. These sources are summarized below.

Local Supplies

Local supplies include groundwater pumping of local aquifers, surface reservoir production, recycled water, and supplies imported through wheeling arrangements or through the Los Angeles Aqueduct, which is owned and operated by the City of Los Angeles. Local supplies have, in the past, provided as much as 2.1 million acre-feet (maf) of water to meet the region's water demands. By far the largest component of local supplies is groundwater pumping, providing over 75% of historical local supplies.

Colorado River Supplies

The distribution and management of Colorado River water is governed by a complex body of laws, court decrees, compacts, agreements, regulations, and an international treaty collectively known as the "Law of the River." Metropolitan's entitlement is established by the fourth and fifth priorities of California's Seven Party Agreement, included in Metropolitan's 1931 and 1946 contracts with the Secretary of the Interior. These priorities provide 550,000 acre-feet (af) per year and 662,000 af per year, respectively. In addition, Metropolitan holds a surplus water contract for delivery of 180,000 af. The physical capacity of the CRA is slightly in excess of 1.3 maf per year, based on a pumping capacity of 1,800 cubic feet per second (cfs). Metropolitan's long-held objective is to maximize the availability of Colorado River water, up to the maximum capacity of the CRA, subject to environmental, contractual, legal, political, financial, and institutional constraints. A California 4.4 Plan is being developed among California parties that will help ensure that full CRA deliveries are maintained, while addressing the concerns of the other Colorado River basin states that rely on the river. The California 4.4 Plan includes core transfers (such as the IID/MWD conservation agreement and the proposed IID/SDCWA transfer), system conservation (such as the lining of the All American Canal), offstream storage (such as the Arizona groundwater storage program), dry year option transfers (such as PVID land fallowing), and river re-operations.

State Water Project

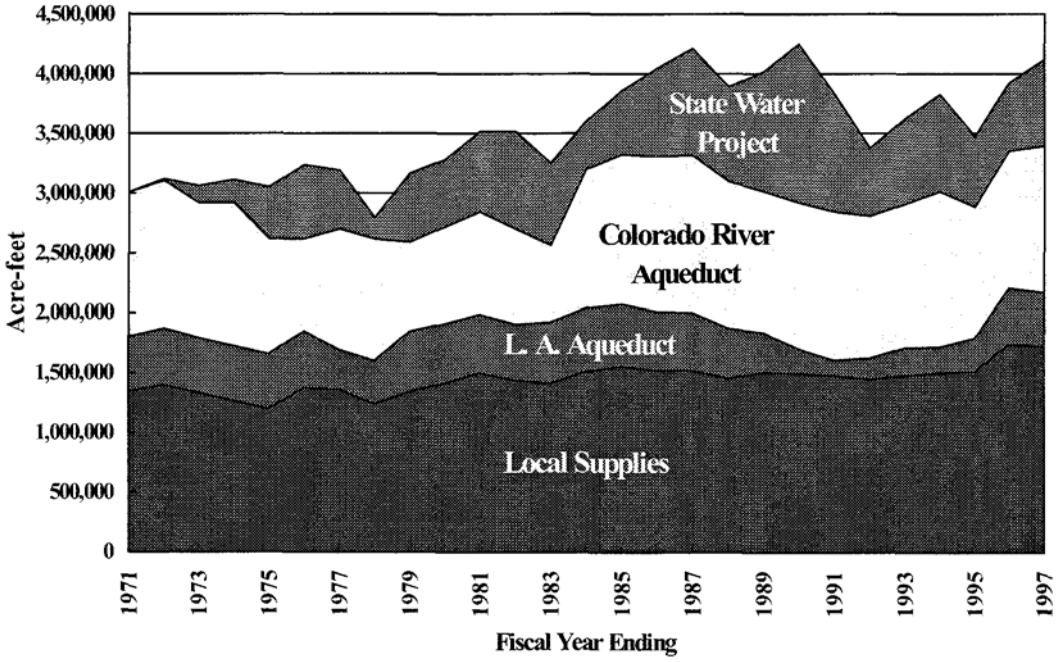
Metropolitan is one of 29 water agencies that have contracted with the State of California, through the Department of Water Resources (DWR), for water deliveries from the SWP system. Metropolitan's contracted entitlement is for 2.01 maf per year, or about 48 percent of the total contracted entitlement of 4.2 maf per year. SWP deliveries to Metropolitan are made via the SWP's California Aqueduct.

Initial SWP facilities, completed in the early 1970's, have produced average supply yields adequate to meet just over half of the total contracted entitlement. While it was intended that additional SWP facilities would be constructed as SWP contractor demands increased up to their contracted entitlements, few facilities have been constructed since that time.

The SWP obtains its supplies primarily from the Sacramento River Basin. About half of the total supply diverted from the Delta for the SWP is regulated flow from the Feather River (a tributary to the Sacramento River), while the other half is unregulated flow from runoff downstream of Sacramento River reservoirs and from other rivers that flow into the Delta. The Sacramento River watershed is subject to wide annual variations in total runoff. The Sacramento River Index (SRI), which measures runoff in the watershed, has averaged about 18 maf per year over the last 90 years. However, runoff varies widely from year to year. For example, the SRI measured 7.8 mafin 1994 and 32.5 mafin 1995.

Figure 1 shows the historical total regional supply production by type. As shown in Figure 1, water supplies were as high as 4.25 mafin 1990 and within two years dropped to 3.4 mar, a 20% decrease.

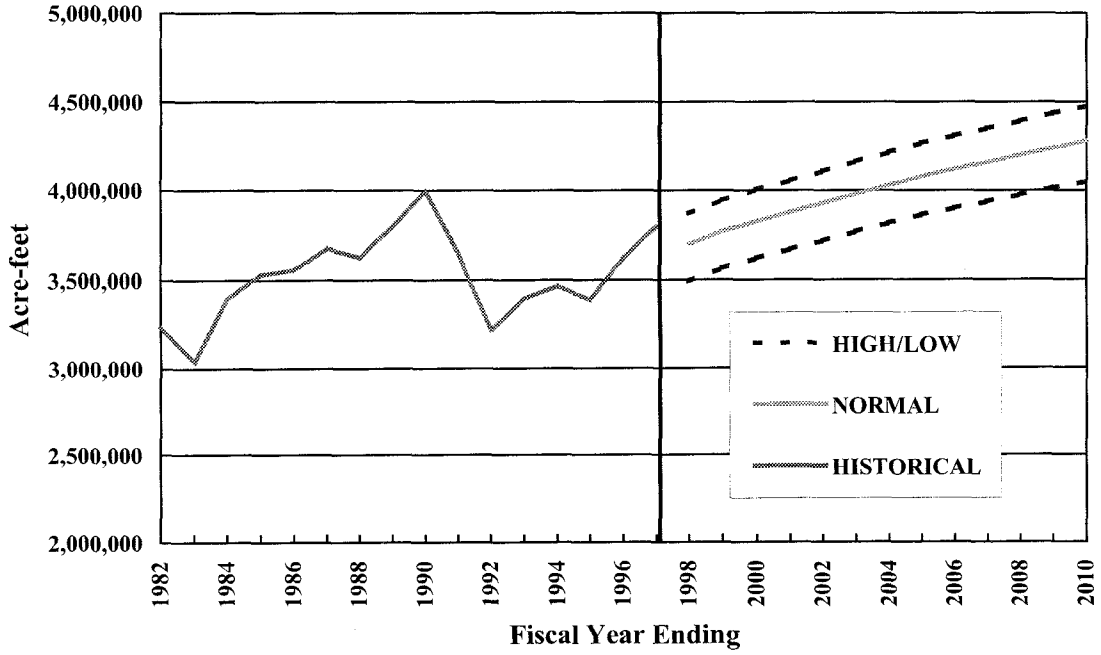
Figure 1. Historical Supply Production by Type of Supply



RETAIL DEMANDS

From 1982 through 1995, the region experienced retail water demands averaging 3.5 mar. In dry years retail demands are approximately 5 to 7% greater than normal years, while demands in wet years are about 6 to 8% below normal demands. Under normal weather conditions, assuming full implementation of conservation best management practices, total regional retail demands are projected to increase from about 3.7 mar in 1997 to almost 4.3 mar in 2010. Without conservation, demands in 2010 would be about 10 to 12% greater than projected. Increases in retail demand are driven by demographics and economics, including changes in population, housing, employment, and income. Figure 2 shows the historical and projected retail demands in Metropolitan's service area.

Figure 2. Regional Retail Water Demands



The historical variability in demands from 1982 to 1997 is mainly due to weather and the economy. In 1983, extreme wet weather caused a significant drop in retail demands. During the period from 1985 to 1990, hot and dry weather coupled with a strong economy resulted in increased demand from 3.5 maf to 4.0 maf, a 14% increase. In 1991, the 5th year of a prolonged drought, conditions forced many communities to implement mandatory supply reductions. These mandatory reductions coupled with extraordinary drought conservation caused a 10 to 15% decrease in retail demands for the region. In addition, the period between 1992 and 1995 was very wet (with the exception of 1994, which was dry), and was a period of severe economic recession. Southern California alone lost some 700,000 jobs from 1990 through 1995. The combination of wet weather, economic recession, and conservation resulted in demands decreasing by over 17%.

DEMANDS ON METROPOLITAN

For many member agencies, Metropolitan's water deliveries represent a supplemental supply. Most member agencies have local water supplies, but agencies differ in how much their supplies alone can meet their respective retail demands. Local supplies are often base-loaded (maximized subject to various constraints) and purchases from Metropolitan are used to meet remaining demands. In addition, to meeting consumptive demands, Metropolitan's deliveries are used to replenish local groundwater and surface reservoirs. To project demands on Metropolitan, projections of member agency's retail water demands and local water supplies are made. Local supplies are then subtracted from retail demands to get consumptive demands on Metropolitan. A projection of Metropolitan's long-term seasonal and replenishment deliveries are made based on safe groundwater yield and weather/hydrology.

Metropolitan forecasts its demands for three different broad categories: Full Service, Seasonal (reservoir storage and groundwater replenishment delivered for shift or long-term storage purposes and sold at a discount), and Agricultural (deliveries of water sold at a discount for agricultural use). Overall, demands on Metropolitan can vary -+ 11 to 18% from normal conditions due to weather and hydrology.

The following four figures show historical and projected demands on Metropolitan by category. Figure 3 shows Basic Water Deliveries, Figure 4 shows Seasonal Water Deliveries, Figure 5 shows Interim Agricultural Water Program (IAWP) Deliveries, and Figure 6 shows Total Water Deliveries for Metropolitan.

Figure 3. MWD Basic Water Deliveries

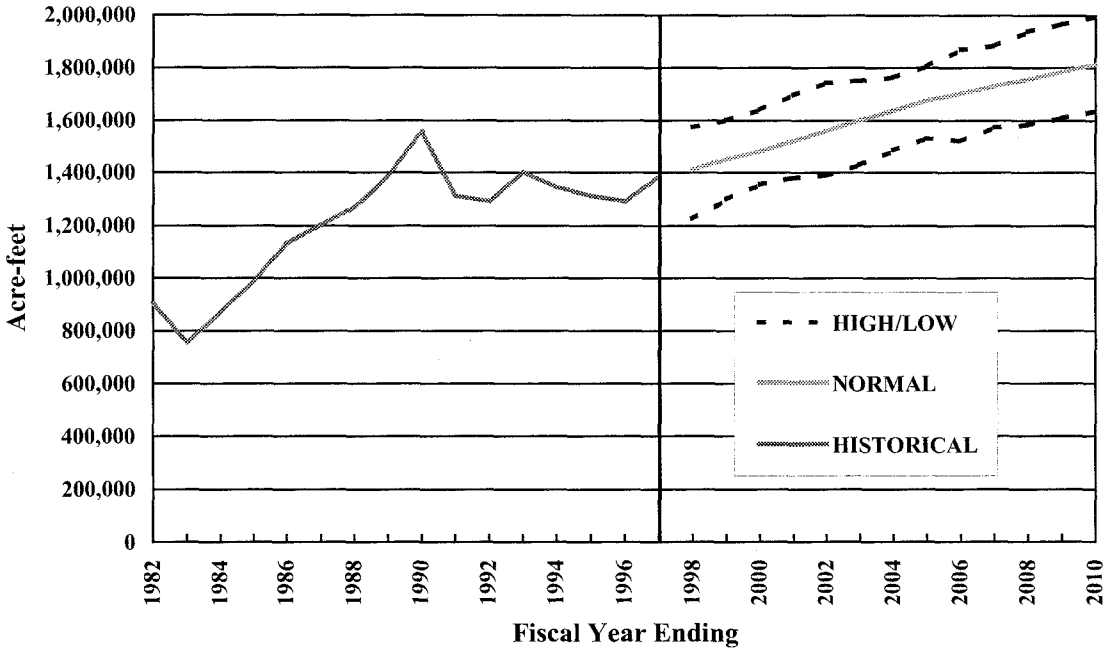


Figure 4. MWD Seasonal Water Deliveries

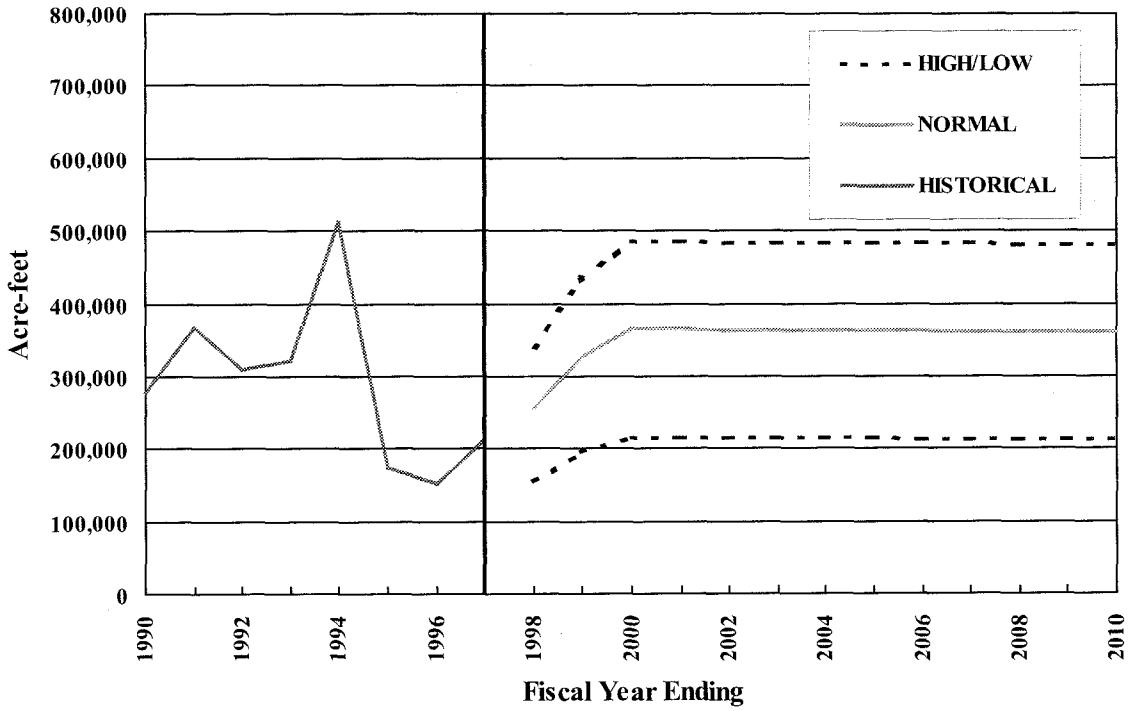


Figure 5. MWD Interim Agricultural Water Program (IAWP) Deliveries

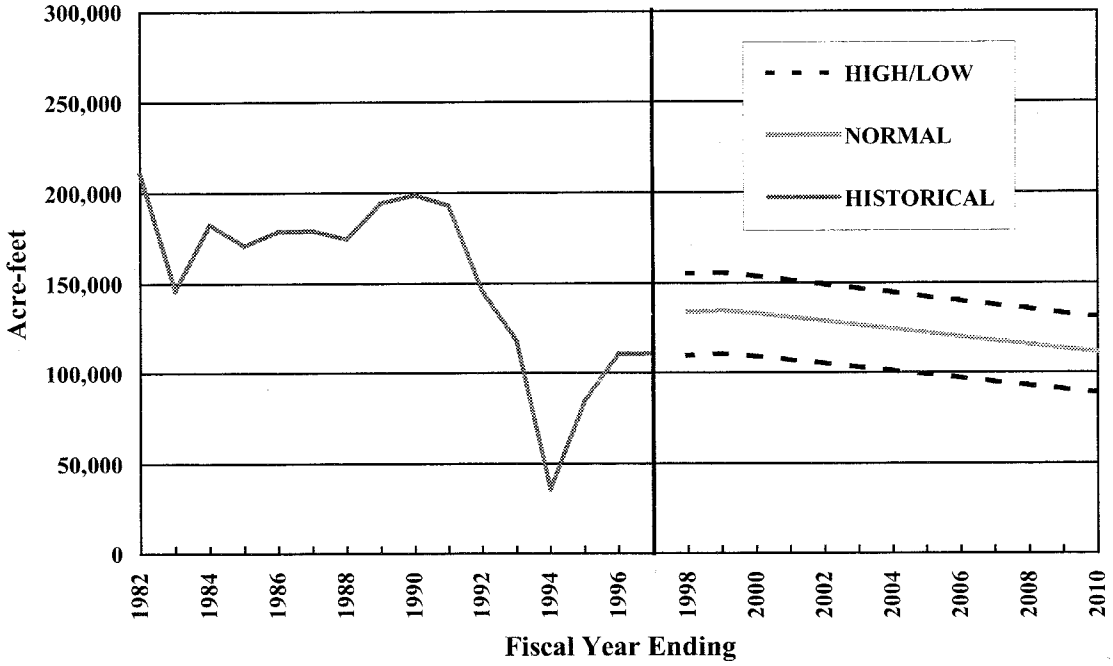
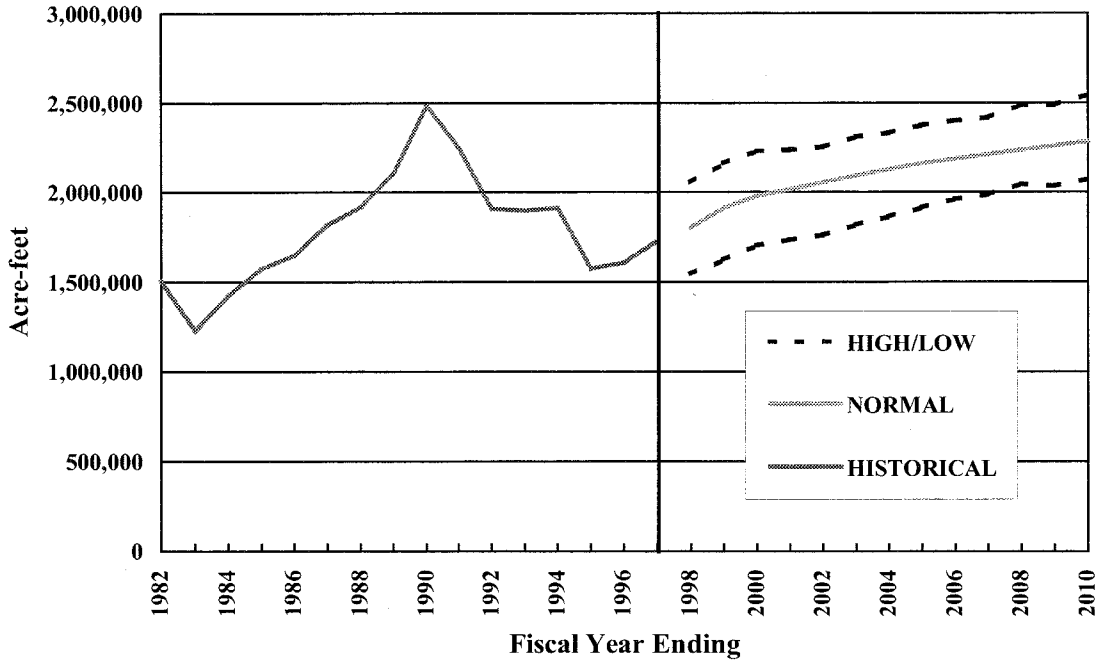


Figure 6. MWD Total Water Deliveries



INTEGRATED RESOURCES PLANNING

To ensure supply reliability under various drought conditions, Metropolitan and its member agencies developed an Integrated Resources Plan (IRP). The IRP, adopted by Metropolitan's Board of Directors in January 1996 and periodically updated, guides Metropolitan's resource and capital improvements investments. The region's ability to develop a long-term WSDM Plan results from the significant investments Metropolitan and its member agencies have made in resources since 1991. To date, these investments include:

- Local supplies: Metropolitan co-funded over 23 local projects and 200 conservation programs that will yield a total of 160,000 af per year.

- **Colorado River Aqueduct:** Metropolitan developed transfers and storage programs to help ensure a full aqueduct. The landmark Metropolitan/Imperial Irrigation District Conservation Program (IID), will result in a savings of 107,000 af per year. Storage programs in Arizona and California, combined with the IID savings, yield a total of 280,000 af of annual core, dry year options, and storage supply.

- **State Water Project:** Metropolitan and other parties negotiated the Bay-Delta Accord and the Monterey Amendment. The Bay-Delta Accord and subsequent efforts will increase the reliability of Metropolitan's entitlement deliveries. The Monterey Amendment provides access to 220,000 af of SWP storage.

- **In-Basin Storage:** Metropolitan is constructing the Eastside Reservoir Project, with 800,000 af of storage (400,000 af of which is emergency storage for use in case of facility failure as a result of earthquake or other event).

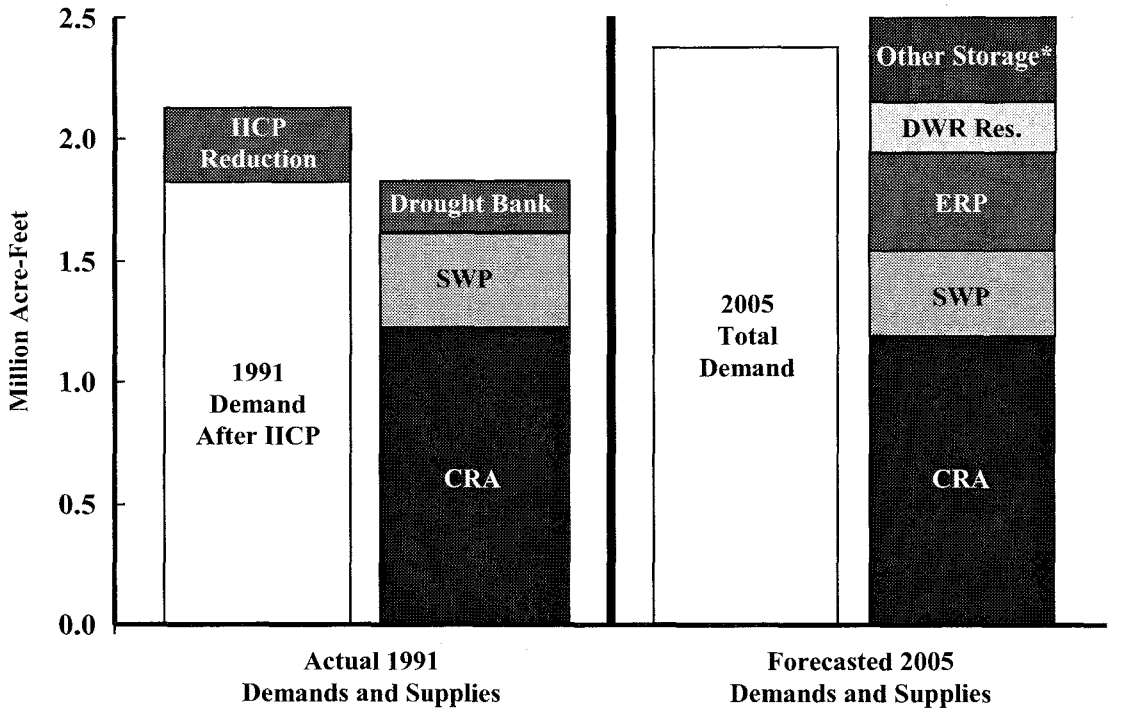
- **Groundwater Conjunctive Use Storage:** Metropolitan developed a conjunctive use storage program in the North Las Posas Basin in Ventura County with an anticipated capacity of 210,000 af and a dry-year withdrawal rate of up to 70,000 af.

- **Transfers and Storage:** Metropolitan developed the Semitropic Storage Program, with 350,000 af of storage and dry-year withdrawals averaging about 60,000 af. Metropolitan also approved the Arvin-Edison Storage and Transfer Program, with 250,000 af of storage and dry-year withdrawals averaging about 70,000 af. Metropolitan is also exploring storage and transfer programs with the Coachella Valley Water District and the Cadiz Land Company.

As a result of these investments, it is anticipated that Metropolitan and its member agencies will be 100% reliable over the next 10 years even under a repeat of the 1991 drought condition. Figure 7 compares actual Metropolitan demands and supplies during 1991 (the last year in a multiyear severe drought) and projected demands and supplies in year 2005 (assuming a repeat of 1991 conditions). In 1991, the region faced shortages that required Metropolitan to allocate water under the Incremental Interruption and Conservation Plan (IICP). The reduction in deliveries came after demands had already been reduced as a result of local conservation. In addition, water had to be purchased from the Governor's drought emergency water bank. By the year 2005 with the investments made to date,

Metropolitan's additional water supplies will be more than adequate to meet demands under a repeat of the 1991 drought event--even with increased demands due to growth.

Figure 7. Historical and Projected Metropolitan Supplies and Demands Under Drought Conditions



*** Groundwater management, Semitropic Storage Program, and Arvin-Edison Storage Program**

SURPLUS AND SHORTAGE RESOURCE ACTIONS

Metropolitan's investments in water resources, facilities, and programs has transformed it from an agency with relatively modest storage capacity to one that will have storage sufficient to manage many shortages without negative impacts to its member agencies or retail customers. To attain this level of reliability, storage programs and facilities, along with conservation, recycling, and other programs, must be managed as an integrated set of regional resources. To accomplish this, the WSDM Plan recognizes the linkage between surplus and shortage resource management actions.

SURPLUS ACTIONS

The combination of Metropolitan's regional storage facilities, such as Lake Mathews, Lake Skinner, the future Eastside Reservoir Project, and the storage capacity available to Metropolitan in Castaic Lake and Lake Perris as a result of the Monterey Amendment, allows Metropolitan great flexibility in managing its water resources. The development of storage programs both outside and within the service area provides even greater flexibility in storing surplus water. Each of the storage facilities and programs plays an important role in achieving Metropolitan's reliability goal.

When imported supplies exceed projected demands for imported water within Metropolitan's service area, Metropolitan can operate storage facilities to maximize stored water to benefit its member agencies. A number of factors affect Metropolitan's ability to divert surplus water into storage. Some of these factors include facility outages, system capacity, water quality (including requirements for managing total dissolved solids), and varying supply and demand patterns. This section provides a description of storage options available to Metropolitan and a framework for storing water in these programs and facilities when surplus supplies are available.

Storage of Colorado River Supplies

Metropolitan has participated in a number of programs to maximize the reliability of supplies from the Colorado River. The landmark Metropolitan/Imperial Irrigation District Conservation Program will result in a savings of 107,000 af per year. These supplies will increase the reliability of Metropolitan's entitlement of Colorado River water. Other programs yield shortage benefits by increasing amounts of water stored for use during shortages. Between August 1992 and July 1994, Metropolitan and the Palo Verde Irrigation District conducted a Test Land Fallowing Program. Approximately 20,000 acres of farmland in the Palo Verde Valley were not irrigated, saving 186,000 af of water which was stored in Lake Mead for later use by Metropolitan. With Arizona and Nevada water agencies, Metropolitan is participating in a Central Arizona Groundwater Storage Demonstration Program that has encouraged the storage of water. To date, 139,000 af of supplies have been stored in groundwater basins in Central Arizona. The Desert Coachella program is an exchange and storage program with agencies situated along the Colorado River Aqueduct. Metropolitan releases Colorado River water for storage in the Coachella Groundwater Basin. Metropolitan then exchanges these supplies for the

participating agencies' SWP supplies. These programs serve as models for future programs that could increase the reliability of Colorado River supplies. Metropolitan continues to explore other possible options that would increase the reliability of supplies. The California 4.4 Plan is being developed among California parties to increase storage programs for Colorado River supplies. In addition to core transfers and conservation programs, the California 4.4 Plan includes offstream storage (such as the Arizona groundwater storage program), dry year option transfers (such as PVID land fallowing), and river re-operations. These programs, in conjunction with favorable supply determinations by the Secretary of Interior, will ensure the highest possible reliability of Colorado River supplies.

In addition to the programs mentioned above, the Colorado River system itself contributes to the high reliability of Metropolitan's Colorado River supplies. Currently, the average Colorado River runoff exceeds basin-wide demands by over 1.0 maf per year. The Colorado River system also contains a great deal of reservoir storage capacity. The total storage capacity in the Colorado River Basin is approximately 60 maf, almost four times the Colorado River's average annual flow. For much of 1997, system storage levels were at 80% or more of total capacity. These factors allow the Bureau of Reclamation, operators of the Colorado River system, to store significant supplies for use during shortages.

Storage of State Water Project Supplies

Total storage capacity is a critical factor in comparing the operations of the Colorado River system with the SWP. On average, both systems have similar amounts of water available on an annual basis. The SWP's watersheds in the Sacramento River Basin have produced about 18 maf per year over the long term, as represented by the Sacramento River Index (SRI.) Long-term runoff on the Colorado River has averaged more than 16 maf annually since 1906. However, the ability to carry over unused water from a wet year for use in a dry year differs substantially between the two systems. State Water Project storage facilities have storage capacity of about 4.5 maf, while system storage in the Colorado River Basin totals nearly 60 maf. This gives the operators of the Colorado River reservoirs much more flexibility in storing unused water from a wet year for use in a subsequent dry year.

When water from the SWP cannot be put to immediate use in Metropolitan's service area, the water may be stored for future use. Provided storage capacity is available, the water may remain in either Oroville Reservoir (as SWP storage for delivery to all contractors the following year) or San Luis Reservoir (as carryover storage assigned to Metropolitan). Through the carryover storage program, as amended by the Monterey Amendment, Metropolitan can place a maximum of 200,000 af per year of allocated supplies in SWP surface reservoirs. The program also allows for carryover storage in non-project facilities, including surface reservoirs and groundwater basins. In the case of carryover storage in San Luis Reservoir, SWP supplies allocated to but unused by a contractor may, under certain conditions, be assigned as carryover if storage capacity is available at the end of the calendar year. However, carryover water stored for a contractor has lower priority than storage of SWP water and consequently "spills" first as San Luis Reservoir fills.

Also, in a wet year such as 1995, low demands may allow DWR to operate San Luis Reservoir nearly full, eliminating any possibility of contractor carryover storage into the following year. As a result, carryover storage on the SWP may not be possible, and even when possible, is subject to spilling.

Due to these carryover storage limitations, Metropolitan has invested a great deal to expand its ability to store surplus SWP supplies. Metropolitan has entered into a number of water transfer and storage agreements. The Semitropic Water Banking and Exchange program allows Metropolitan to store up to 350,000 afin the groundwater basin underlying the Semitropic Water Storage District. The storage and withdrawal capacities of the program are shared with other participants in the storage program, with Metropolitan's share equaling 35%. Dry-year withdrawals will average about 60,000 af.

Metropolitan and the Arvin-Edison Water Storage District have developed a program that allows Metropolitan to store water in the groundwater basin in the Arvin-Edison service area. The program would allow the storage and withdrawal of 250,000 af of supplies over the next 25430 years. Dry-year withdrawals will average about 70,000 af.

Storage in Regional Facilities

In addition to the storage of Colorado River and SWP supplies outside the region, Metropolitan has established a number of programs for storing supplies within the region. Metropolitan owns and operates two main surface reservoirs, Lake Mathews and Lake Skinner, which have a combined storage of about 226,000 af. Only a small portion of this capacity is available for shortages, with the balance being used to regulate flows in Metr0Politan's delivery system. The Eastside Reservoir Project, currently under construction, will have a total capacity of 800,000 af, with approximately 400,000 af of operational drought and seasonal storage and 400,000 af of emergency storage. Through the Monterey Amendment, Metropolitan obtained the fight to use up to 220,000 af of water stored in the SWP terminal reservoirs. However, withdrawals from these terminal reservoirs must be replaced within five years.

Metropolitan and its member agencies have established the cyclic storage program to increase storage in groundwater basins within the service area. Regional groundwater basins offer an economical way for Metropolitan to improve supply reliability by storing water within the service area. This makes water readily accessible in times of need, either in emergency situations or during shortages. Some limitations are imposed by the fact that such water can generally only be used through pumping from the groundwater basin by an overlying member agency or local agency. Storage in groundwater basins takes place either by direct replenishment (spreading or injection), or through in-lieu means. Spreading (or injection) is desirable because direct measurement of the amount of stored water is a relatively simple, verifiable transaction. The main disadvantage to direct spreading is that spreading can occur only under certain conditions. For example, spreading cannot occur when spreading facilities are being used to capture local storm runoff for flood control purposes, or when the amount of local runoff precludes the need

for imported water to replenish the basins. Also, spreading basins require frequent maintenance to assure maximum efficiency. These and other conditions can limit the ability to deliver water for spreading at a time when surplus supplies are available.

In-lieu replenishment allows most member agencies to participate in groundwater replenishment without needing direct access to replenishment facilities. Their wells, in effect, become their replenishment facilities. Both direct and in-lieu replenishment from 1986 through 1990 served the region well during the critical drought years from 1991 through 1993.

The overall objective of the various storage programs is to maximize the availability of imported water during times of need by storing surplus water in a strategic manner and utilizing the storage available within the region. Many factors affect the availability of storage capacity and Metropolitan's ability to move water to and from various facilities. After reviewing the full range of shortage actions available to Metropolitan, a framework for prioritizing the full range of surplus and shortage actions will be presented.

In addition to pricing incentives used to encourage local agencies to store water in groundwater basins, Metropolitan has developed a conjunctive use contractual storage program with the Calleguas MWD in the North Las Posas Basin. Metropolitan will fund the construction of wells which will be called upon to meet demands during dry years. This program will yield a dry year supply of about 70,000 af.

SHORTAGE ACTIONS

Except in severe or extreme shortages or emergencies, Metropolitan's management of available resources will allow shortages to be mitigated without negatively impacting retail M&I demands. Below is a list of drought actions that will be taken during periods of shortage. The goal of these actions is to avoid, to the extent practicable, the allocation of Metropolitan's firm supplies. The order in which these actions are presented does not imply the exact operational management of resources that would occur. In fact, several actions are likely to be taken concurrently. Many factors dictate the particular order in which actions will be taken during an actual shortage, although it is clear that the last action will be the curtailment of firm deliveries to the member agencies.

- Draw on storage in the Eastside Reservoir Project
- Draw on out-of-region storage in Semitropic and Arvin-Edison
- Reduce/suspend long-term seasonal and groundwater replenishment deliveries
- Draw on contractual groundwater storage programs in the region
- Draw on SWP terminal reservoir storage (per Monterey Agreement)
- Call for extraordinary drought conservation and public education
- Reduce IAWP deliveries
- Call on water transfer options contracts
- Purchase transfers on the spot market
- Implement an allocation of Metropolitan's imported supplies to its member agencies

Even with dedicated programs to meet the reliability goal for the region, proper management and operations of these resources is critical to ensure reliability. The prioritization of both surplus and shortage actions need to account for several important criteria. It is also important to recognize that these criteria will need to be balanced. The criteria include:

Location: Out-of-region storage is more vulnerable than in-basin-storage due to the risks of seismic events. To only maximize out-of-region storage will put reliability at risk.

Take capacity: Surface reservoirs generally have the ability to be filled and drawn down very quickly. Certain groundwater storage programs have limited take capacities--requiring several years at full take capacity to withdraw **all** available storage. Stored water will be balanced so that dry year supplies are maximized.

Cost: Programs vary with respect to their marginal operating costs. Program actions will be taken to maximize supply reliability while minimizing cost.

Flexibility: Not all storage programs and transfers offer the same flexibility to Metropolitan. Some programs can only meet specific overlying demands, while others can meet demands anywhere in the system.

DESCRIPTIONS OF RESOURCE ACTIONS

Draw on storage in the Eastside Reservoir Project: Withdrawals from the Eastside Reservoir Project would provide a flexible supply for meeting a shortage. Eastside Reservoir Project supplies can be drawn upon quickly. The amount of water drawn from the Eastside Reservoir Project before exercising other shortage actions will depend on the severity of the shortage and the overall condition of other resources available to Metropolitan.

Draw on out-of-region storage in Semitropic and Arvin-Edison programs: Out-of-region programs such as Semitropic and Arvin-Edison provide cost-effective shortage supplies. These supplies also provide flexibility, as they can be distributed as effectively as any SWP supplies coming into Metropolitan's service area. Exercising these programs relatively early in the order of actions reduces the risk of leaving supplies out-of-region. Based upon the ratio of storage capacity to take capacity, these programs will generally provide supplies over several years. This provides the rationale for calling on these programs relatively early in a shortage.

Reduce Long-Term Seasonal and Replenishment Deliveries, and call on cyclic storage accounts: Certain interruptible supply programs provide benefits during shortage. Reducing deliveries to interruptible programs established for storage purposes, while continuing expected levels of groundwater production, allows limited supplies to go toward meeting direct consumptive uses. In addition, calling on cyclic storage accounts can extend the replenishment needs for several years. Most replenishment supplies would be expected to be interruptible for a minimum of two years before agencies would be allowed to claim a local supply adjustment on such supplies. Some programs have longer interruption requirements. For example, most Groundwater Recovery Programs are governed by contracts that require supply production through a three-year interruption in service.

Draw on contractual groundwater storage programs: In-region contractual groundwater programs provide cost-effective supplies that would be drawn upon during shortages. These programs are also

limited by their take capacities and generally have several years of withdrawals in storage. For this reason, these programs might be called upon before withdrawing heavily from surface reservoir storage.

Draw on SWP terminal reservoir storage: The storage available in the SWP terminal reservoirs provides a flexible and cost-effective shortage supply. Supplies withdrawn from this program must be replaced within five years of withdrawal. For this reason, the storage in these reservoirs would be reserved for more serious shortage conditions and would be utilized after the programs and facilities listed above were used to meet the shortage.

Call for extraordinary drought conservation: Voluntary conservation programs have historically been effective in reducing water demand during drought. However, voluntary conservation programs are not without impact to the retail customer and can be perceived as a failure of water agencies to properly plan for shortages. Therefore, the call for extraordinary drought conservation will only be taken with the consent of Metropolitan's Board of Directors.

Reduce agricultural deliveries: The Interim Agricultural Water Program (IAWP) offers interruptible water to southern California's agricultural industry at discounted rates. These supplies will be interrupted as part of Metropolitan's shortage actions. Metropolitan will work with IAWP participants to provide as much advance warning of interruption as possible. The IAWP reflects current policies toward agricultural water users. The policies underlying this program are due to be reviewed during the ten-year period of the WSDM Plan. The WSDM Plan will be changed accordingly.

Call on water transfer option contracts: Transfer options programs provide cost-effective supplies when the region is faced with reducing deliveries to meet consumptive demands. These programs might also be used to increase storage levels in Metropolitan storage facilities. Replenishment of these facilities reduces the risk of leaving available supplies outside the region and helps to protect the region during extended shortages.

Purchase transfers on the spot market: During the 1987-92 drought, the Drought Water Bank proved to be one mechanism for California to reduce the overall impacts of the shortage. However, the cost of spot market supplies may cause Metropolitan to use them as a last increment of supply before the region implements reductions in M&I deliveries. It is likewise possible that availability and cost will make spot market options more favorable under certain conditions. If this occurs then spot market supplies will be sought prior to calls on option transfers. However, participation in the spot market may be restricted to those agencies that have already taken significant actions in response to the shortage.

Implement allocation plan: As the final stage in responding to shortages, Metropolitan will implement an allocation plan to deliver reduced supplies to its member agencies. The issues of allocation and the methods of allocation are outlined in the following section.

ALLOCATION OF SUPPLY FOR M&I DEMANDS

The equitable allocation of supplies is addressed by the Implementation Goals established for the WSDM Plan, with the first goal being to "avoid mandatory import water allocations to the extent practicable." The second fundamental goal is to "equitably allocate imported water on the basis of agencies' needs." Factors for consideration in establishing the equitable allocation include retail and economic impacts, recycled water production, conservation levels, growth, local supply production, and participation and investment in Metropolitan's system and programs. In the event of an extreme shortage an allocation plan will be adopted in accordance with the principles of the WSDM Plan.

INTEGRATED RESOURCE MANAGEMENT STRATEGY

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 data. Certain strategies yield high reliability but incur very high costs. This is the case for strategies that utilize relatively costly transfer programs early in a shortage while maintaining high storage levels. If a shortage is short, this results in high transfer costs and shortage storage programs that are not fully utilized. Other strategies draw more heavily on storage early in a shortage and do not use options transfer programs. Later in a shortage, the yields from these transfer programs, combined with low yields from depleted storage facilities, might not make up for continuing or deepening shortages. Overall, such approaches may be inexpensive to pursue at the wholesale level but have high costs associated with retail level impacts. The resource management framework presented results from extensive analysis of various strategies for managing available resources under a variety of surplus and shortage conditions. Although the extent to which various actions are exercised may still vary depending on specific shortage conditions, the ordering presented does reflect Metropolitan's anticipated order of actions during shortages.

RESOURCE MANAGEMENT FRAMEWORK

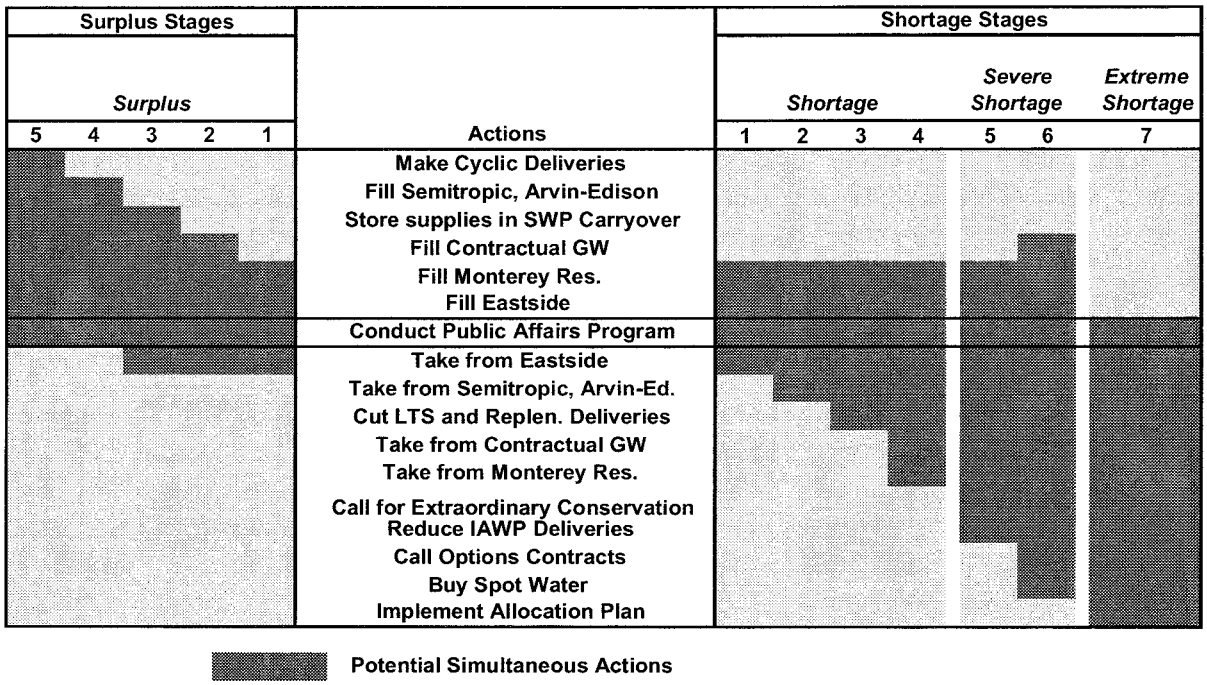
The analysis of surplus and shortage actions yields a water management framework that accounts for the degree or "stage" of surplus and shortage. These stages are defined by parameters such as storage levels and expected SWP supplies. Each stage has associated actions that could be taken as part of the response to prevailing shortage conditions. For example, Surplus Stage 1 might have as associated actions to place water in the highest-priority storage resources. Figure 8 shows the mapping between actions and stages. The darkly shaded diagonal area identifies actions that can be undertaken concurrently, while the lightly shaded areas show actions that will not be taken. For example, Metropolitan will not withdraw water from most storage resources during a surplus.

Figure 8 highlights several aspects of the WSDM Plan's approach to supply management. First and most importantly, it does not dictate a response to shortage or surplus. The framework recognizes the complexity and variety of conditions that could require various responses. Supporting this framework are general "rule curves" that dictate the extent to which particular actions are taken in various stages of surplus or shortage. For example, the rule curves indicate approximately how much water should be taken from the Eastside Reservoir Project before calling on supplies from the Semitropic or Arvin-Edison storage programs. If a shortage were greater than the desired initial withdrawal from the Eastside Reservoir Project, then Stage 2 actions would be taken. The rule curves for a particular resource would take into account shortage stage, monthly delivery requirements, and when various supplies are available.

Surplus and Shortage Stages are determined by the total amount of water that would be stored or produced by exercising the actions in that Stage. Overall storage levels in each stage are determined by the extent to which storage is increased or reduced by earlier actions. Therefore, each Stage is defined by supplies (stored or produced) and an approximate overall level of storage remaining in all resources. Up through Shortage Stage 4, the actions taken will not result in negative impacts to any consumptive uses. Shortage Stages 1 through 4 constitute shortage management without retail level impacts. The conservation efforts and reductions in IAWP deliveries in Shortage Stage 5 will result in retail impacts.

Action by the Metropolitan Board of Directors would be required before actions corresponding to Stages 5, 6, and 7.

Figure 8. Resource Stages and Actions Matrix



The Stages and Actions Matrix (Figure 8) is read from the center moving outward. Moving from the center to the left, are actions that Metropolitan will take during surplus conditions. For instance, in a Stage 3 Surplus, Metropolitan will be adding water to the Eastside Reservoir Project, the Monterey Reservoirs (if any water is due for repayment), Contractual Groundwater Programs, and carryover storage on the State Water Project. Moving from the center to the right are actions that Metropolitan will take during periods of shortage. For instance, in a Stage 3 Shortage, Metropolitan will be pulling water from the Eastside Reservoir Project, the Semitropic and Arvin Edison programs, and interrupting deliveries of Long-Term Seasonal and Replenishment program water. In addition, the Stages and Actions Matrix allows for surplus actions to be taken during shortages and vice versa, but these actions are strictly a result of prudent water management. For example, in a Stage 6 Shortage, Figure 8 shows Metropolitan potentially filling the Eastside Reservoir Project, the Monterey Reservoirs, and contractual groundwater programs while calling on spot transfers and buying spot water. Through these actions Metropolitan will be ensuring that water supply opportunities during a drought are realized--ultimately adding to the drought reserves of southern California.

Figure 8 also highlights the on-going efforts by Metropolitan and its member agencies in the conduct of public outreach and active conservation programs. Through all conditions, effective pubilc outreach and conservation programs are an integral part of Metropolitan's management of resources. In addition to ongoing conservation and water efficiency programs, Stage 5 of the Stages and Actions Matrix calls for participation of the citizens of southern California to take extraordinary conservation measures to cut water demand during droughts.

As with the listing of shortage actions earlier in the report, the Stages/Actions matrix in Figure 8 only highlights certain programs and response actions. However, unlike the discussion of actions earlier, Figure 8 is intended to convey Metropolitan's currently anticipated ordering for those actions listed. As the supply and demand outlooks, programs, and other factors continue to change, the analysis of the ordering of actions will continue during the ten-year period of the WSDM Plan.

SUPPLY CERTAINTY AND THE TIMING OF RESOURCE ACTIONS

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. When do various pieces of information about the supply/demand balance become more certain? When should this information impact policy-making and trigger various resource actions? The WSDM Plan addresses these questions and the actual implementation of the Plan during a shortage.

Figure 9 shows a hypothetical shortage year. With respect to the supply and demand outlook, a typical shortage year will have periods of certainty and stability, and other periods of relative uncertainty and transition. Important supply components--such as the SWP, CRA, Los Angeles Aqueduct (LAA), and local supplies--are closely monitored through the early part of the year. These supplies and demands are fairly well-known through the April-September period. Storage is assessed in the post-summer period and decisions about certain programs, such as long-term (LT) seasonal deliveries could be made at this time.

Figure 9. Water Supply Outlook Throughout the Year

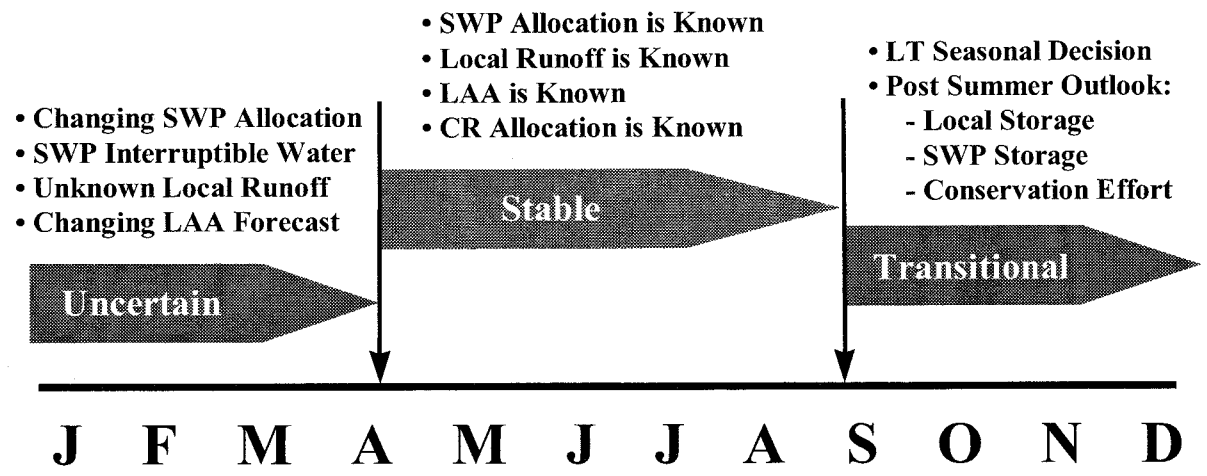
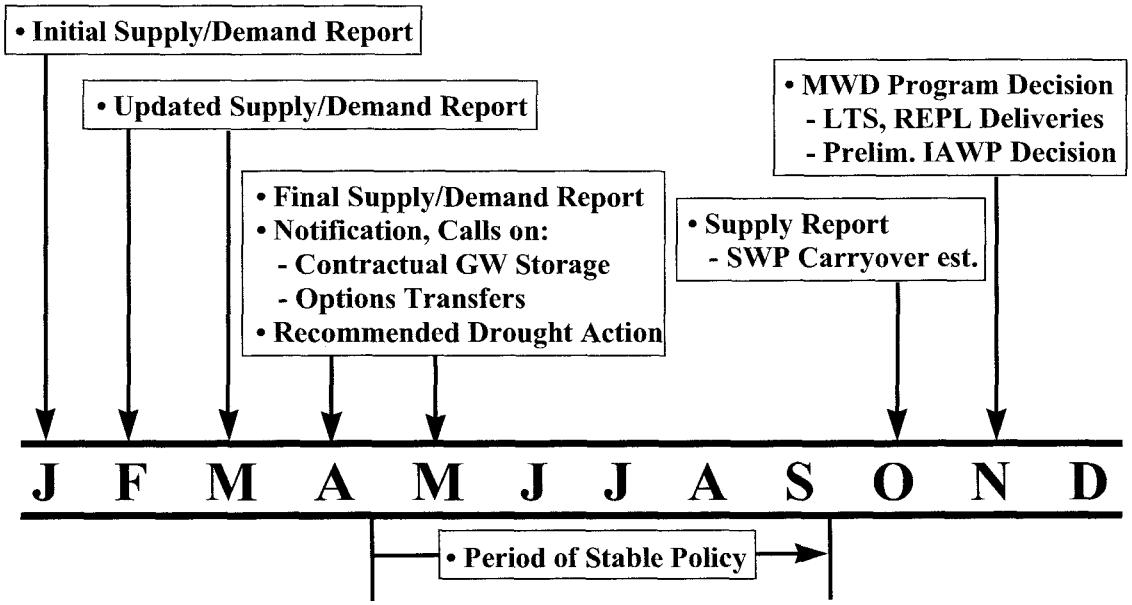


Figure 10 presents the annual schedule for actions taken in response to shortage conditions. Starting in January, an initial supply/demand report will be presented to the Metropolitan Board of Directors. SWP allocations are still only estimates in January and become more certain towards April and May. Demands for Metropolitan deliveries depend in part on how the winter hydrology develops and the condition of local supplies. These factors start to become known during the February-March period and will be reported to the Board in the Supply Report Update. By April-May, the outlook for imported supplies is known to a fairly high degree of certainty and a Final Supply Report will be produced. The May-September period will be one in which the import supply situation does not change drastically and drought policies can be implemented. Demands can be more or less than anticipated as a result of unusually hot or cool weather. At the end of summer, carryover SWP storage will be determined. October through December is a transitional period during which early assessments of available supplies for the following year will be made. During this period, Board actions would determine the management of various Metropolitan programs such as long-term seasonal (LTS) and IAWP deliveries. The following list presents major information and decision points during the year.

Month	Information/Action
January	Initial Supply/Demand Reports
February, March	Updated Supply/Demand Reports
April, May	Final Supply/Demand Report
	Notification on Contractual GW and Options Transfer Programs
	Recommended Drought Actions
May-September	Stable Policy Period
October	Supply and Carryover Storage Report
November	MWD Program Decisions - LT Seasonal, Replenishment, IAWP

Figure 10. One Year of a Hypothetical Shortage - Supply and Demand Reports and Response Actions



PUBLIC OUTREACH AND CONSERVATION

Mechanisms are already in place to implement most of the water management actions and programs that are addressed in the WSDM Plan. Under the majority of supply and demand conditions, the actions of Metropolitan's Board of Directors, the General Manager, the operational activities of Metropolitan, and its member agencies would constitute all actions necessary to mitigate the shortage. Several aspects of the WSDM Plan, however, require additional attention to the administration of programs and actions. In particular, a shortage contingency requires special programs in the areas of public and governmental affairs and conservation. Metropolitan maintains an on-going public information program to encourage efficient water use. Public outreach programs are conducted at all times under both surplus and shortage conditions (see Figure 8). The actions discussed in this section constitute special actions in times of shortage.

During shortage conditions, public outreach will play a critical role in shaping consumer response. Public information campaigns need to send clear signals if extraordinary drought conservation is to achieve needed reductions in demands. Given Metropolitan's diverse set of customers and the varying impacts that shortages can have on different consumer groups, an effective public information campaign will require a joint effort among Metropolitan and its member agencies. Under this Plan, the administration of the Public Information and Government Affairs programs will be the responsibility of a Drought Program Officer (DPO). The DPO will be responsible for integrating the various activities in these areas, coordinating efforts with Metropolitan's Board of Directors and member agencies, and designing the region-wide messages for the general public and various target audiences. Important constituencies that have been identified in the process are residential users, business interests, agricultural users, elected officials, officials of various agencies (such as the Department of Water Resources), and the media.

Many conservation programs, such as Metropolitan's ultra-low flush toilet rebate program, are driven by member agency requests. Based on history, Metropolitan expects member agency requests to increase during droughts. Metropolitan is committed to increasing overall conservation program funding to meet member agency requests during droughts and attain higher levels of savings. These programs will be implemented by Metropolitan and member and local agency conservation staff. As many of the short-term conservation objectives during a shortage would be dependent upon an effective public information program, the Drought Program Officer will also be responsible for monitoring the effectiveness of the augmented conservation programs. A monthly conservation reporting process will be implemented. Quarterly estimates of regional conservation will be developed to track the progress of various actions in mitigating the shortage.

APPENDIX A: RESOURCE AND STORAGE SIMULATION

The Water Surplus and Drought Management Plan (WSDM Plan) uses the Stages and Actions Matrix (Figure 8) as a guide for the operation of storage and transfers for the next ten years, 1999-2008**.** Metropolitan asserts that the investments that Metropolitan and its member agencies have made in water supply and storage, managed in a coordinated manner as presented in the WSDM Plan, will be sufficient to assure that retail firm water demands will be met 100% of the time through the year 2008. Metropolitan performed an extensive analysis of projected water demands, current and expected water supplies, along with hydrologic variations to support this assertion. Appendix A presents a summary of this analysis which includes statistical probabilities of actions under the WSDM Plan and two illustrative examples of how supply resources may be used in the future under worst-case drought events. Although the WSDM Plan is intended to be in effect through 2008, for the purposes of analysis the planning horizon was extended through 2010.

The WSDM Plan seeks to define the operational envelope for the Metropolitan system into the near future. Although the WSDM Plan only looks out ten years, it nonetheless involves the operation of some storage and water transfer projects that have not yet become fully operational. This makes the estimation of storage and transfers operations difficult. Compounding this problem is the lack of certainty around future demands, economic conditions, or even the weather over the next ten years. To manage these uncertainties, Metropolitan has developed a computer based simulation model called the Integrated Resources Planning Simulation Model or IRPSIM.

IRPSIM uses a modeling method known as sequentially indexed monte-carlo simulation. Simply put, the model looks at projected regional retail demand and supplies of water over the next twelve years and adjusts each, up or down, based on an assumed pattern of future weather. For instance, if Metropolitan expected the weather over the next twelve years (1999-2010) to be the same as the last twelve years (1987-1998), then IRPSIM would adjust the projected 1999 demands and supplies based on the historical 1987 hydrology, and adjust the projected 2000 demands and supplies using the historical 1988 hydrology, and so on. One obvious drawback to this approach is that Metropolitan does not know what future weather will be. Therefore, Metropolitan runs the models over and over again until all recorded hydrologies, 70 in all, have been tried. In this way, Metropolitan can look at probabilistic results of being in shortage year by year through 2010.

Although the projections of water supplies used in this analysis required certain assumptions to be made, they were based on most likely or probable outcomes. In most cases, projected water supplies represented projects that are currently operational, under construction, or in the final stages of negotiations. The following represents a summary of these assumptions:

- Local recycling and groundwater recovery: assumes currently operational projects with expected increases in supply yield as demand increases

- Conjunctive use groundwater storage: assumes Las Posas (under final stages of construction) and implementation of similar programs which are under negotiation (such as Raymond, Orange, and Chino Basins)

- Semitropic and Arvin-Edison storage: assumes use of both programs which are operational with water already stored

- Eastside Reservoir Project: assumes use of non-emergency storage from the reservoir currently under construction and an initial fill projected to start in approximately one year

- The Monterey Reservoirs: assumes use of State Water Project terminal reservoir supplies, Castaic and Perris Reservoirs, per the Monterey Amendment

- Colorado River Aqueduct: assumes a full aqueduct through the implementation of the California Plan (including lining of All American and Coachella canals, SD/IID water transfer/exchange, conjunctive use off-aqueduct storage, and river re-operations)

- State Water Project: assumes continuance of Bay-Delta Accord (with only current facilities)

One way of viewing the result of Metropolitan's WSDM Plan analyses is by summary statistics. Table A- 1 gives the probabilities of shortage actions over the next twelve years.

Table A-1. Probability of Shortage Stage[1] by Forecast Year

1999	13%	13%	11%	7%	3%	0%	O%
2000	13%	13%	11%	9%	3%	O%	0%
2001	19%	17%	13%	10%	6%	O%	0%
2002	19%	17%	13%	10%	4%	1%	0%
2003	19%	19%	14%	11%	4%	0%	0%
2004	20%	19%	16%	13%	4%	0%	0%
2005	21%	19%	17%	13%	6%	O%	O%
2006	21%	19%	19%	13%	6%	0%	0%
2007	23%	20%	19%	13%	4%	0%	0%
2008	26%	21%	19%	16%	6%	1%	0%
2009	26%	24%	19%	17%	6%	1%	0%
2010	26%	26%	19%	19%	6%	1%	O%

Table A-1 can be read in one of two ways, by column or row. The Stage 7 column indicates that there are no historical weather conditions that require allocation over the next twelve years. This is the single most important conclusion of the WSDM Plan analysis. The Stage 6 column indicates that only in a few years--2002, and 2008 through 2010--would Metropolitan need have a need for option or spot transfer water. Read by row, Table A-1 indicates that in the year 2008 there is a 21% likelihood of taking some water from the Eastside Reservoir Project, a 19% likelihood of taking water from Semitropic or Arvin-Edison storage programs, a 17% likelihood of interrupting long-term seasonal and replenishment deliveries for two years, and so on. It should be noted that these probabilities represent the best current estimates by Metropolitan, but are based entirely on historical weather conditions. Conditions that fall outside of historical ranges, either in duration or severity, are not represented by this data.

Another way to view the WSDM Plan analysis is by observing the operation of a single hydrology. Table A-2 provides an example of resource operations for the period 1999 through 2010 assuming a repeat of the 1923 through 1934 hydrology. The table provides descriptions of hydrologic conditions to aid in understanding the example.

[1] Stage 1 consists of withdrawal from the Eastside Reservoir Project. Stage 2 consists of the above plus withdrawals from the Semitropic and Arvin-Edison water storage and transfer projects. Stage 3 consists of the above plus an interruption of Long-Term Seasonal and Replenishment discount water. Stage 4 consists of the above plus withdrawal from contractual groundwater programs and the Monterey Reservoirs. Stage 5 consists of the above plus a call for extraordinary drought conservation and interruption in agricultural discount water. Stage 6 consists of the above plus calls on option contract water and purchases of water on the open market. Stage 7 consists of the above plus allocation of remaining shortages. For a full description of stages and action, see Surplus and Shortage Resource Actions section and Figure 8 above.

For instance, 1923 was considered to be a dry year in southern California (defined as less than 9 inches of rain at the Los Angeles Civic Center) and is categorized by the California Department of Water Resources (DWR) as a below normal year for State Water Project deliveries. In this example, 1923 weather increases southern California's demand for water and decreases imported State Water Project supplies. The Colorado River Aqueduct supplies are influenced by yet another hydrologic indicator, but for the next ten year Metropolitan expects the Aqueduct to be full.

Table A-2 indicates that retail water demands in 1999, assuming a 1923 hydrology, will be 3.979 million acre-feet (maf). Adding expected long-term seasonal and replenishment demands of 0.165 maf gives a regional total water demand of 4.144 maf. After subtracting local supplies of 2.192 maf, which are also adjusted for 1923 weather, Metropolitan expects to see a demand of 1.952 maf. In 1999, under a 1923 hydrology, Metropolitan expects to see 2.954 maf of supply. This is enough to meet all expected demands and put over 1.0 maf into storage.

The 1923 through 1934 hydrology is significant because it starts and ends dry with little recovery in the middle. However, even in these most adverse conditions the actions proposed by the WSDM Plan provides the region with enough water to avoid shortage allocation. Again the most important result of this example is read from the last line, which indicates that there are no remaining shortages through 2008

Table A-3 provides a second example of using the 1980 through 1991 hydrology. This hydrology contains the most significant drought in recent record, ending with a critically dry year on the State Water Project that is expected to yield a mere 0.389 maf. However, even under these conditions the WSDM Plan provides a method to avoid firm water allocation.

The analyses performed using the prioritized action of the Stages and Actions Matrix support Metropolitan's assertion that water supply reliability can be attained through the use of regional storage, interruption of discounted water supplies, and transfers. And, through the implementation of the WSDM Plan, Metropolitan does not expect to allocate firm water deliveries for at least the next ten years.

ATTACHMENT A

Table A-2. A Simulation of Water Supplies and Demands 1923-1934 Hydrology

Forecast Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Hydrology Year	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
Hydrologic Conditions												
Southern California Year Type	Dry	Dry	Dry	Wet	Wet	Dry	Dry	Normal	Wet	Normal	Wet	Normal
Sacramento River Index D1630 Year Type	Below Normal	Critically Dry	Dry	Dry	Wet	Above Normal	Critically Dry	Dry	Critically Dry	Dry	Critically Dry	Critically Dry
Demands												
Retail Demand	3.979	4.152	4.149	4,018	4.005	**4.249**	4.237	4.223	4.280	4.280	4.407	4.500
Long-term/Replenishment Demand	0.165	0.182	0.226	0.188	0.149	0.176	0,213	0.203	0.164	0.175	0.141	0.163
Total Demand	4.144	4.334	4.375	4.205	4.154	4.425	4.450	4.426	4,443	4.455	4.548	4,663
Local Supplies												
Groundwater Production	1.529	1.545	1.537	1.288	1.299	1.575	**1.568**	1.434	1.307	1.439	1.318	1.454
L. A. Aqueduct Production	0.383	0,287	0.304	0.316	0.392	0.302	0,245	0.235	0.174	0,324	0.251	0.220
Recycling Production	0.152	0.162	0.174	0.186	0,197	0.207	0.217	0.230	0,242	0.254	0.266	0.277
Surface Production	0,128	0,089	0,076	0.116	0.154	0.147	0.108	0.094	0,133	0,136	0.151	0.145
Total Local Supply	2,192	2.084	2.091	1.905	2,043	2.231	2,139	1.993	1.856	2.153	1.986	2,097
Total MWD Demand	1.952	2.250	2,284	2,300	2.112	2.194	2.311	2.433	2.587	2.302	2.562	2.566
MWD Supply Sources												
Colorado River Aqueduct Supply	1.200	1.200	1.200	1.200	1.200	**1.200**	1.200	1.200	1.200	1.200	1.200	1.200
State Water Project Supply	1.754	0.812	0.783	1.280	1.678	1.438	0,764	1.163	0,589	0.843	0.559	0.620
MWD Cyclic Groundwater Deliveries	0.000	0.060	0.060	0.000	0.000	0,000	0.060	0,060	0.060	0.059	0.000	0.000
Eastside Reservoir	0.000	0.066	0.058	0.000	0.000	0.000	0,060	0.010	0.425	0.023	0.219	0.041
Arvin/Semitropic Groundwater Storage	0.000	0.111	0.115	0,000	0.000	0,000	0,119	0,000	0.115	0.117	0.059	0.041
Longterm Seasonal Demand Cuts	0.000	0,000	0,166	0.000	0.000	0.000	0.153	0.000	0.104	0,116	0.000	0.000
Cyclic Benefits	0.000	0.000	0.000	0.000	0.000	0.000	0,000	0,000	0,000	0,000	0.060	0.060
Contractual Groundwater Storage	0.000	0.000	0.000	0,000	0.000	0.000	0.000	0,000	0.095	0.000	0.095	0.084
DWR Reservoirs (Monterey Agreement)	0.000	0.000	0,000	0.000	0.000	0.000	0.000	0.000	0,000	0,000	0.131	0.088
Voluntary Conservation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0,000	0.000	0.206	0.210
MWD Ag Cuts	0.000	0.000	0.000	0.000	0.000	0,000	0.000	0.000	0.000	0.000	0.033	0.031
Central Valley Transfers	0.000	0.000	0,000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.193
Storage Puts	1.003	0.000	0.097	0.180	0.549	0.438	0.045	0.000	0,000	0.056	0.000	0.000
Remaining Shortage	0,000	0,000	0.000	0,000	0.000	0.000	0.000	0,000	0.000	0.000	0.000	0.000

Table A-3. A Simulation of Water Supplies and Demands 1980-1991 Hydrology

Forecast Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Hydrology Year	1923	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
Hydrologic Conditions												
Southern California Year Type	Wet	Normal	Normal	Wet	Dry	Dry	Wet	Normal	Normal	Dry	Dry	Normal
Sacramento River Index D1630 Year Type	Above Normal	Dry	Wet	Wet	Wet	Dry	Wet	Dry	Critically Dry	Dry	Critically Dry	Critically Dry
Demands												
Retail Demand	3.781	4.170	3.930	3.647	4.308	4.250	4.151	4.281	4.380	4.550	4.663	4.497
Lon£1-term/Replenishment Demand	0.105	0.141	0.171	0.101	0.136	0.187	0.183	0.201	0.191	0.219	0.224	0.214
Total Demand	3.886	4.311	4.101	3.748	4.444	4.437	4.334	4.483	4.572	4.769	4.887	4.712
Local Supplies												
Groundwater Production	1.292	**1.440**	**1.381**	1.248	1.546	1.565	1.275	1.413	1.438	1.588	1.600	1.446
L. A. Aqueduct Production	0.462	0.372	0.499	0.529	0.516	O.367	0.472	0.400	0.326	0.278	0.213	0.223
Recycling Production	0.152	0.162	0.174	0.186	0.197	0.207	0.217	0.230	0.242	0.254	0.266	0.277
Surface Production	0.225	0.175	0.154	0.194	0.195	0.151	0.115	0.116	0.115	0.081	0.068	0.081
Total Local Supply	2.131	2.149	2.208	2.156	2.455	2.290	2.081	2.159	2.122	2.200	2,146	2.027
Total MWD Demand	1.755	2.162	1.894	1.591	1.989	2.147	2.253	2.324	2.450	2.569	2.741	2.684
MWD Supply Sources												
Colorado River Aqueduct Supply	1.200	1.200	1.200	1,200	1.200	1.200	1.200	1.200	**1.200**	1.200	1.200	1.200
State Water Project Supply	1.561	1.441	1.725	1.886	1.643	1.590	1.441	1.292	0.611	1.285	0.877	0.389
MWD Cyclic Groundwater Deliveries	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.060	0.060	0.060	0.060
Eastside Reservoir	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.199	0.024	0.222	0.209
Arvin/Semitropic Groundwater Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.115	0.000	0.122	0.104
Long-term Seasonal Demand Cuts	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.131	0.000	0.164	0.154
Cyclic Benefits	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Contractual Groundwater Storage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.133	0.000	0.095	0.085
DWR Reservoirs (Monterey Agreement)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.216
Voluntary Conservation	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.235
MWD Ag Cuts	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032
Central Valley Transfers	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Storage Puts	1.006	0.260	0.344	0.240	0.200	0.200	0.388	0.168	0.000	0.000	0.000	0.000
Remaining Shortage	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

ATTACHMENT B

Water Supply Allocation Plan



December 2014 Revision

Metropolitan Water District of Southern California

ATTACHMENT B

Inside cover: Photo courtesy of Cora Edmonds/ArtXchange for the Healing Planet

Water Supply Allocation Plan

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List of Acronyms

AF – Acre-feet
CUP – Groundwater Conjunctive Use Program
CWD – County Water District
DWP – Drought Management Plan
IAWP – Interim Agricultural Water Program Reductions and Rates
IICP – Incremental Interruption and Conservation Plan
IRP – Integrated Resources Plan
GPCD – Gallons per Capita per Day
M&I – Municipal and Industrial
MWD – Municipal Water District
RUWMP – Regional Urban Water Management Plan
SWP – State Water Project
WSAP – Water Supply Allocation Plan
WSDM – Water Surplus and Drought Management

Definitions

Extraordinary Supplies- Deliberate actions taken by member agencies to augment the total regional water supply only when Metropolitan is allocating supplies through the WSAP.

Groundwater Recovery- The extraction and treatment of groundwater making it usable for a variety of applications by removing high levels of chemicals and/or salts.

In-lieu deliveries- Metropolitan-supplied water bought to replace water that would otherwise be pumped from the groundwater basins.

Seawater Barrier- The injection of fresh water into wells along the coast to protect coastal groundwater basins from seawater intrusion. The injected fresh water acts like a wall, blocking seawater that would otherwise seep into groundwater basins as a result of pumping.

Section 1: Introduction

Calendar Year 2007 introduced a number of water supply challenges for the Metropolitan Water District of Southern California (Metropolitan) and its service area. Critically dry conditions affected all of Metropolitan's main supply sources. In addition, a ruling in the Federal Courts in August 2007 provided protective measures for the Delta Smelt in the Sacramento-San Joaquin River Delta which brought uncertainty about future pumping operations from the State Water Project. This uncertainty, along with the impacts of dry conditions, raised the possibility that Metropolitan would not have access to the supplies necessary to meet total firm demands[1] and would have to allocate shortages in supplies to the member agencies.[2]

In preparing for this possibility, Metropolitan staff worked jointly with the member agency managers and staff to develop a Water Supply Allocation Plan (WSAP). The WSAP includes the specific formulas for calculating member agency supply allocations and the key implementation elements needed for administering an allocation should a shortage be declared. The WSAP became the foundation for the urban water shortage contingency analysis required under Water Code Section 10632 and was incorporated into Metropolitan's 2010 Regional Urban Water Management Plan (RUWMP).

Section 2: Development Process

Member Agency Input

Between July 2007 and February 2008, Metropolitan staff worked cooperatively with the member agencies through a series of member agency manager meetings and workgroups to develop a formula and implementation plan to allocate supplies in case of shortage. These workgroups provided an arena for in-depth discussion of the objectives, mechanics, and policy aspects of the different parts of the WSAP. Metropolitan staff also met individually with fifteen member agencies for detailed discussions of the elements of the recommended proposal. Metropolitan introduced the elements of the proposal to many nonmember retail agencies in its service area by providing presentations and feedback to a number of member agency caucuses, working groups, and governing boards. The discussions, suggestions, and comments expressed by the member agencies during this process contributed significantly to the development of this WSAP.

Board of Directors Input

Throughout the development process Metropolitan's Board of Directors was provided with regular progress reports on the status of this WSAP, with oral reports in September, October, and December 2007, an Information Board of Directors Letter with a draft of the WSAP in November 2007, and a Board of Directors Report with staff recommendations in January 2008. Based on Water Planning and Stewardship Committee discussion of the staff recommendations and further review of the report by

[1] Firm demands are also referred to as uninterruptable demands; likewise non-firm demands are also called interruptible demands.
[2] See Appendix A: Metropolitan Member Agencies.

the member agencies, refinements were incorporated into the WSAP for final consideration and action in February 2008. The WSAP was adopted at the February 12, 2008 Board of Directors meeting.[3]

The 12-Month Review Process

When the Board adopted the WSAP in February 2008, the decision specified a formal revisit of the WSAP commencing in February 2010. The scheduled revisit was meant to ensure the opportunity for Metropolitan staff and the member agencies to re-evaluate the WSAP and recommend appropriate changes to the Board of Directors.

In April 2009, the Board voted to implement the WSAP for the first time. The WSAP was implemented at a Level 2 allocation level, and was in effect for the period of July 1, 2009, through June 30, 2010. Since implementation of the 2009/10 WSAP began in July 2009, a number of practical issues relating to the WSAP were identified by staff and the member agencies for further consideration during the 12-Month Review Process. Metropolitan staff engaged with the member agencies in a formal review of the WSAP from January through May 2010. During the review process the member agency managers participated in a series of six workshops. The focus of these workshops was to facilitate in-depth discussion on WSAP-related issues and lessons learned since the WSAP was implemented in July 2009. The proposed adjustments to the WSAP developed during the review process were adopted at the August 17, 2010 Board of Directors meeting[4].

The Three-Year Review Process

The Board action to adopt of the WSAP in February 2008 also directed staff to review the WSAP formula three years after the February 2008 adoption. February 2011 marked the three-year anniversary since the adoption of the WSAP. Similar to the 12-Month Review Process, the purpose of the Three-Year Review Process was to provide an opportunity for Metropolitan staff and the member agencies to re-evaluate the plan and recommend appropriate changes for board consideration.

Metropolitan staff met with the member agencies in a formal review of the WSAP from February through August 2011. Staff and member agency managers participated in a series of eleven workshops. Proposed adjustments to the WSAP developed during the process were adopted at the September 13, 2011 Board of Directors meeting.[5]

[3] A complete listing of member agency meetings and Board of Directors reporting activities is contained in Appendix B: Water Supply Allocation Plan Process Timeline.

[4] A complete listing of member agency meetings and Board of Directors reporting activities is contained in Appendix C: 12-Month Review Process and Results.

[5] A complete listing of member agency meetings and Board of Directors reporting activities is contained in Appendix D: Three-Year Review Process and Results.

2014 Review Process

In 2014, California was challenged with a third year of severe drought.[6] Metropolitan managed its operations through significant use of regional storage reserves. It was anticipated that end of year total dry storage reserves would approach levels similar to those when the WSAP was last implemented in 2009.

Following discussion at the June 2014 Water Planning and Stewardship Committee, Metropolitan staff convened a member agency working group to revisit the WSAP. The purpose of the working group was to collaborate with member agencies to identify potential revisions to the WSAP in preparation for mandatory supply allocations in 2015. There were eight working group meetings and three discussions at the monthly Member Agency Managers' Meetings.

The process focused on three areas of the WSAP: the Base Period, the Allocation Formula, and the Allocation enforcement mechanism. Proposed adjustments to the WSAP developed during the process were adopted at the December 9, 2014 Board of Directors meeting. [7]

[6] The Governor of California proclaimed a State of Emergency due to drought conditions on January 17, 2014 and, on April 24, 2014 issued an Executive Order proclaiming a continued State of Emergency noting drought conditions have persisted for the last three years and authorizing adoption and implementation of emergency regulations.

[7] A complete listing of member agency meetings and Board of Directors reporting activities is contained in Appendix E: 2014 Review Process and Results.

Section 3: Review of Historical Shortage Plans[8]

The WSAP incorporates key features and principles from the following historical shortage allocation plans but will supersede them as the primary and overarching decision tool for water shortage allocation.

Interruptible Water Service Program

As part of the new rate structure implemented in 1981, Metropolitan's Board of Directors adopted the Interruptible Water Service Program (Interruptible Program) which was designed to address short-term shortages of imported supplies. Under the Interruptible Program, Metropolitan delivered water for particular types of use to its member agencies at a discounted rate. In return for this discounted rate, Metropolitan reserved the right to interrupt delivery of this Interruptible Program water so that available supplies could be used to meet municipal and industrial demands.

Incremental Interruption and Conservation Plan

The ability to interrupt specific deliveries was an important element of Metropolitan's strategy for addressing shortage conditions when it adopted the Incremental Interruption and Conservation Plan (IICP) in December 1990. Reductions in IICP deliveries were used in concert with specific objectives for conservation savings to meet needs during shortages. The IICP reduced Interruptible Service deliveries in stages and provided a pricing incentive program to insure that reasonable conservation measures were implemented.

1995 Drought Management Plan

The 1995 Drought Management Plan (DMP) was a water management and allocation strategy designed to match supply and demand in the event that available imported water supplies were less than projected demands. Adopted by the Metropolitan Board of Directors in November 1994, the 1995 DMP was a short-term plan designed to provide for the 1995 calendar year only. The primary objective of the 1995 DMP was to identify methods to avoid implementation of mandatory reductions. The 1995 DMP included various phases and a step-by-step strategy for evaluating supply and demand conditions and utilizing Metropolitan's available options, with the final phase being implementation of the revised IICP.

1999 Water Surplus and Drought Management Plan

Metropolitan staff began work on the Water Surplus and Drought Management (WSDM) Plan in March 1997 as part of the Integrated Water Resources Plan (IRP), which was adopted by Metropolitan's Board of Directors in January 1996. The IRP established regional water resource targets, identifying the need for developing resource management policy to guide annual operations. The WSDM Plan defined Metropolitan's resource management policy by establishing priorities for the use of regional resources to achieve the region's reliability goal identified in the IRP. In April 1999, Metropolitan's Board of Directors adopted the WSDM Plan.

[8] A summary of the key elements in the following allocation plan is found in Appendix F: Summary of Historical Shortage Plans.

The WSDM Plan also included a set of principles and considerations for staff to address when developing specific allocation methods. The WSDM Plan stated the following guiding principle to be followed in developing any future allocation scheme:

> *"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 periods of shortage."*[9]

This principle reflects a central desire for allocation methods that are both equitable and minimize regional hardship to retail water consumers. The specific considerations postulated by the WSDM Plan to accomplish this principle include the following:[10]

- The impact on retail customers and the economy
- Allowance for population and growth
- Change and/or loss of local supply
- Reclamation/Recycling
- Conservation
- Investment in local resources
- Participation in Metropolitan's interruptible programs
- Investment in Metropolitan's facilities.

Section 4: Water Supply Allocation Formula

Based on the guiding principle and considerations described in the WSDM Plan, Metropolitan staff and the member agencies developed a specific formula for allocating water supplies in times of shortage. The formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level, and takes into account growth, local investments, changes in supply conditions and the demand hardening[11] aspects of non-potable recycled water use and the implementation of conservation savings programs. The formula, described below, is calculated in three steps: base period calculations, allocation year calculations, and supply allocation calculations.[12] The first two steps involve standard computations, while the third section contains specific methodology developed for this WSAP.

Base Period Calculations

The first step in calculating a water supply allocation is to estimate water supply and demand using a historical base period with established water supply and delivery data. The base period for each of the different categories of demand and supply is calculated using data from the fiscal years (July through June) ending 2013 and 2014.[13]

[9] WSDM Plan, p. 1. Emphasis added.
[10] WSDM Plan, p. 2.
[11] Demand hardening is the effect that occurs when all low-cost methods of decreasing overall water demand have been applied (e.g., low-flow toilets, water recycling) and the remaining options to further decrease demand become increasingly expensive and difficult to implement.
[12] Detailed operational elements of these objectives and a numerical example are discussed in Appendix G: Water Supply Allocation Formula Example.
[13] Exceptions to this methodology are noted in the descriptions of base period calculations.

Base Period Local Supplies: Local supplies for the base period are calculated using a two-year average of groundwater production, groundwater recovery, Los Angeles Aqueduct supply, surface water production, and other imported supplies. Non-potable recycling production is not included in this calculation due to its demand hardening effect.

Base Period Wholesale Demands: Demands on Metropolitan for the base period are calculated using a two-year average of firm purchases and in-lieu deliveries to long-term groundwater replenishment, conjunctive use, cyclic, and supplemental storage programs.

Base Period Retail Demands: Total retail-level municipal and industrial (M&I) demands for the base period are calculated by adding the Base Period Wholesale Demands and the Base Period Local Supplies. This estimates an average total demand for water from each agency.

Base Period Mandatory Conservation Credit: Metropolitan allows a consultation process that enables member agencies to describe mandatory water use restrictions and/or rationing restrictions that were in place within their service areas during the Base Period. Restrictions may vary among agencies but include restricted water uses, fines, and water budget or penalty based rate structures that are enacted by the governing body of the member agency or retail agency. Following the consultation process, Metropolitan staff will recommend adjustments based on evidence of reduced GPCD. To qualify for an adjustment, GPCD reductions would have to be observed that are beyond those expected from the agency's ongoing conservation efforts and trends.

Allocation Year Calculations

The next step in calculating the water supply allocation is estimating water needs in the allocation year. This is done by adjusting the base period estimates of retail demand for population or economic growth and changes in local supplies.

Allocation Year Retail Demands: Total retail M&I demands for the allocation year are calculated by adjusting the Base Period Retail Demands for baseline inflation and growth.

Baseline Inflation Adjustment: Baseline inflation occurs when non-potable recycling or conservation is developed after the Base Period. The development of these supplies reduces actual demands for water in the Allocation Year. Because non-potable-recycling and conservation are excluded from the WSAP formula, the actual need for water in the Allocation year is overestimated. The Baseline Inflation Adjustment removes increases in non-potable recycling and conservation annually from the Base Period forward to better reflect the true need for water in the Allocation Year.

Growth Adjustment: The growth adjustment is calculated using the estimated actual annual rate of population growth at the county level, as generated by the California Department of Finance, whenever possible. For years without complete data, the growth rate is calculated using an average of the three most recent years available. Growth will be allocated based on historical per capita water use during the Base Period, with a cap equal to Metropolitan's IRP Target for Water Use Efficiency. For

allocation years up to and including 2014, the cap will be 163 GPCD, and for allocation years 2015-2020 the cap will reduce linearly from 163 to 145 GPCD. On an appeals basis, member agencies may request that their adjustment be calculated using member agency level population growth. A weighted combination of actual population and actual employment growth rates may also be requested.

Allocation Year Local Supplies: Allocation Year Local Supplies include groundwater production, groundwater recovery, Los Angeles Aqueduct supply, surface water production, seawater desalination, and other imported supplies. Estimates of Allocation Year Local Supplies are provided by the member agencies upon implementation of a WSAP. If estimates are not provided, Metropolitan will use the sum of the Base Period Local Supplies and Base Period In-Lieu Deliveries as a default. Agencies may provide updated estimates at any time during the Allocation Year to more accurately reflect their demand for Metropolitan supplies.

Extraordinary Supplies: Under the WSAP formula, local supply production in the Allocation Year can either be designated as a "planned" supply, or as an "extraordinary" supply.[14] This is an important designation for a member agency because the two types of supplies are accounted for differently in the WSAP formula. Local supplies classified at Extraordinary Supply are only partially included (scaled depending on the WSAP Level) as local supplies. This has the effect of providing significantly more benefit to the member agency in terms of total water supply that is available to the retail customer.[15]

Allocation Year Wholesale Demands: Demands on Metropolitan for the allocation year are calculated by subtracting the Allocation Year Local Supplies from the Allocation Year Retail Demands.

Water Supply Allocation Calculations

The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. The following table displays the elements that form the basis for calculating the supply allocation. Each element and its application in the allocation formula are discussed below.

Table 1: Shortage Allocation Index

(a) Regional Shortage Level	(b) Wholesale Minimum Percentage	(c) Maximum Retail Impact Adjustment Percentage
1	92.5%	2.5%
2	85.0%	5.0%
3	77.5%	7.5%
4	70.0%	10.0%

[14] Appendix H: Board Policy Principles on Determining the Status of Extraordinary Supply lists the key Board principles used in determining if a supply qualifies as an Extraordinary Supply.
[15] See Appendix G: Water Supply Allocation Formula Example for specific allocation formulae.

5	62.5%	12.5%
6	55.0%	15.0%
7	47.5%	17.5%
8	40.0%	20.0%
9	32.5%	22.5%
10	25.0%	25.0%

Regional Shortage Level: The WSAP formula allocates shortages of Metropolitan supplies over ten levels.

Wholesale Minimum Allocation: The Wholesale Minimum Allocation ensures a minimum level of Metropolitan supplied wholesale water service to each member agency.

Maximum Retail Impact Adjustment: The purpose of this adjustment is to ensure that agencies with a high level of dependence on Metropolitan do not experience disparate shortages at the retail level compared to other agencies when faced with a reduction in wholesale water supplies. The Maximum Retail Impact Percentage is prorated on a linear scale based on each member agency's dependence on Metropolitan at the retail level. This percentage is then multiplied by the agency's Allocation Year Wholesale Demand to determine an additional allocation.

Conservation Demand Hardening Credit: The Conservation Demand Hardening Credit addresses the increased difficulty in achieving additional water savings at the retail level that comes as a result of successful implementation of water conserving devices and conservation savings programs. To estimate conservation savings, each member agency will establish a historical baseline Gallons Per Person Per Day (GPCD) calculated in a manner consistent with California Senate Bill SBx7-7.[16] Reductions from the baseline GPCD to the Allocation Year are used to calculate the equivalent conservation savings in acre-feet. The Conservation Demand Hardening Credit is based on an initial 10 percent of the GPCD-based Conservation savings plus an additional 5 percent for each level of Regional Shortage set by the Board during implementation of the WSAP. The credit will also be adjusted for:

- The overall percentage reduction in retail water demand
- The member agency's dependence on Metropolitan

The credit is calculated using the following formula:

Conservation Demand Harding Credit = Conservation Savings x (10% + Regional Shortage Level Percentage) x (1 +((Baseline GPCD – Allocation Year GPCD)/Baseline GCPD)) x Dependence on MWD Percentage

[16] California Department of Water Resources, February 2011, "Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use. Available at: http://www.water.ca.gov/wateruseefficiency/sb7/docs/MethodologiesCalculatingBaseline_Final_03_01_2011.pdf

This provides a base demand hardening credit equal to 10 percent of conservation savings and increases the credit as deeper shortages occur, which is when conservation demand hardening has a bigger impact on the retail consumer. The credit also increases based on the percentage of an agency's demand that was reduced through conservation. This accounts for increased hardening that occurs as increasing amounts of conservation are implemented. Lastly, the credit is scaled to the member agency's dependence on Metropolitan to ensure that credits are being applied to the proportion of water demand that is being affected by reductions in Metropolitan supply.

Minimum Per-Capita Water Use Credit: This adjustment creates a minimum per capita water use threshold. Member agencies' retail-level water use is compared to two different thresholds. The proposed minimum thresholds are based upon compliance guidelines established under Senate Bill X7-7.

- 100 GPCD total water use
- 55 GPCD residential water use

Agencies that fall below either threshold under the WSAP will receive additional allocation from Metropolitan to bring them up to the minimum GPCD water use level. If an agency qualifies under both thresholds, the one resulting in the maximum allocation adjustment will be given.[17] To qualify for this credit, member agencies must provide documentation of the total agency level population and the percent of retail level demands that are residential; no appeal is necessary.

Total WSAP Allocation: The allocation to an agency for its M&I retail demand is the sum of the Wholesale Minimum Allocation, the Retail Impact Adjustment, the Conservation Demand Hardening Credit, and the Minimum Per-Capita Water Use Credit.[18]

Total Metropolitan Supply Allocations: In addition to the WSAP Allocation described above, agencies may also receive separate allocations of supplies for and seawater barrier and groundwater replenishment demands. Allocations of supplies to meet seawater barrier demands are to be determined by the Board of Directors independently but in conjunction with the WSAP. Separating the seawater barrier allocation from the WSAP allocation allows the Board to consider actual barrier requirements in the Allocation Year and address the demand hardening issues associated with cutting seawater barrier deliveries. According to the principles outlined for allocating seawater barrier demands, allocations should be no deeper than the WSAP Wholesale Minimum Percentage implemented at that time.

The WSAP also provides a limited allocation for drought-impacted groundwater basins based on the following framework:[19]

[17] See Appendix J: Per Capita Water Use Minimum Example for specific minimum per-capita water use credit formulae and example.
[18] See Appendix G: Water Supply Allocation Formula Example for specific allocation formulae.
[19] See Appendix L: Groundwater Replenishment Allocation for more information.

1. Metropolitan staff will hold a consultation with the requesting member agency and the appropriate groundwater basin manager to document whether the basin is in one of the following conditions:
    a. Groundwater basin overdraft conditions that will result in water levels being outside normal operating ranges during the WSAP allocation period; or
    b. Violations of groundwater basin water quality and/or regulatory parameters that would occur without imported deliveries
2. An allocation is provided based on the verified need for groundwater replenishment. The allocation would start with a member agency's ten-year average purchases of imported groundwater replenishment supplies (excluding years in which deliveries were curtailed). The amount would then be reduced by the declared WSAP Regional Shortage Level.

Section 5: WSAP Implementation

The WSAP will take effect if a regional shortage is declared by the Board of Directors. The following implementation elements are necessary for administering the WSAP during a time of shortage. These elements cover the processes needed to declare a regional shortage level as well as provide information pertaining to the allocation surcharge.

Allocation Period

The allocation period covers twelve consecutive months, from July of a given year through the following June. This period was selected to minimize the impacts of varying State Water Project (SWP) allocations and to provide member agencies with sufficient time to implement their outreach strategies and rate modifications.

Setting the Regional Shortage Level

Metropolitan staff is responsible for recommending a Regional Shortage Level for the Board of Directors' consideration. The recommendation shall be based on water supply availability, and the implementation of Metropolitan's water management actions as outlined in the WSDM Plan. Metropolitan staff will keep the Board of Directors apprised to the status of water supply conditions and management actions through monthly reports to the Water Planning and Stewardship Committee. To further facilitate staff in the development of a recommended regional shortage level, member agency requests for local supply adjustments shall be submitted by April 1st.

Metropolitan's Board of Directors, through the Water Planning and Stewardship Committee, is responsible for approving the final Regional Shortage Level at its April meeting. By the April meeting, the majority of the winter snowfall accumulation period will have passed and will allow staff to make an allocation based on more stable water supply estimates. Barring unforeseen large-scale circumstances, the Regional Shortage Level will be set for the entire allocation period, which will provide the member agencies an established water supply level for their planning.

Exit Strategy

While the Board ultimately has discretion to implement or lift and allocation at any point of time during the year; the WSAP includes a two-part exit strategy that is meant to streamline the WSAP implementation decision making process.

- If the Board decides to implement the WSAP, then any current WSAP allocation would remain in place until the end of the Allocation Year.
- If the Board decides not to implement the WSAP, then any current WSAP allocation would be terminated concurrent with the Board decision.

Allocation Appeals Process

An appeals process is necessary for the administration of any changes or corrections to an agency's allocation. Metropolitan's General Manager will designate, subsequent to a declaration of an allocation by the Board of Directors, an Appeals Liaison as the official point of contact for all information and inquiries regarding appeals. All member agency General Managers will be notified in writing of the name and contact information of the Appeals Liaison. Only appeals that are made through the Appeals Liaison and in accordance with the provisions outlined in Appendix N: Allocation Appeals Process will be evaluated. Basis for appeals claims can include but are not limited to:

- Adjusting erroneous historical data used in base period calculations
- Adjusting for population growth rates
- Determining if a local supply qualifies as Extraordinary Supply

Additional details and a checklist for the appeals process are available in Appendix N: Allocation Appeals Process and Appendix O: Appeals Submittal Checklist.

Allocation Surcharge

Member agency allocations are supported by an Allocation Surcharge. The Allocation Surcharge is charged to water use above the Member Agency allocation and is charged in addition to Metropolitan's standard rates for water service. Allocation Surcharges will only be assessed to the extent that an agency's total annual usage exceeds its total annual allocation. Any revenues collected through the Allocation Surcharge will be applied towards Metropolitan's Water Management Fund, which is used to in part to fund expenditures in dry-year conservation. No billing or assessment of allocation surcharges rates will take place until the end of the twelve-month allocation period.

Allocation Surcharge: The application of the Allocation Surcharge structure is a two tier structure that provides a lower level of Allocation Surcharge for minor overuse of allocations and a higher level of Allocation Surcharge for major overuse of allocations. The structure and applicable Allocation Surcharges are listed in Table 2.

Table 2: Allocation Surcharge			
Water Use	**Base Water Rate[20]**	**Allocation Surcharge[21]**	**Total Rate**
100% of Allocation	Tier 1	0	Tier 1
Between 100% and 115%	Tier 1	$1,480	Tier 1 + ($1,480)
Greater than 115%	Tier 1	$2,960	Tier 1 + ($2,960)

Qualifying Income-Based Rate Allocation Surcharge Adjustment:[22] Any Allocation Surcharges incurred by a member agency under the WSAP will be adjusted to reflect the extent to which retail customers within a member agency's service area are served under a "lifeline" or similar qualified discounted rate program based on income or ability to pay ("Income-Based Rate").

Any member agency who is assessed Allocation Surcharges under the WSAP may submit an acre-foot equivalent of water used by retail customers served under a qualifying Income-Based Rate.[23] This amount of water use would be multiplied by the percentage of retail-level reduction in allocation year demand necessary for that member agency to avoid exceeding its WSAP allocation. The monetary amounts resulting from these acre feet are subtracted from the total monetary amounts incurred by an agency for exceeding its allocation. In the case that the monetary amounts associated with the Income-Based Rate are greater than the total Allocation Surcharges an agency incurs, no Allocation Surcharges will be incurred. The end result of this adjustment is that the member agency will not be subject to Allocation Surcharges for the use of water by their retail customers served under a qualifying Income-Based Rate.

Growth Rate Allocation Surcharge Adjustment": In recognition of member agency differences in geography and climate, a Growth Rate Allocation Surcharge Adjustment will be given to any agency that exceeds its WSAP Allocation. The Allocation Surcharge reduction will be based on the difference in acre-feet between the Growth Adjustment applied at Metropolitan's IRP planning goal rate, and the greater of the following:

- The IRP planning goal rate adjusted for the member agency's ETo, or
- The member agency's certified and documented 20x2020 targeted GPCD

If both of these alternatives result in a lower growth adjustment than the IRP planning goal, no Allocation Surcharge reduction will be made.

[20] The base water rate shall be the applicable water rate for the water being purchased. In most cases, it will be the Tier 1 rate (plus Treatment Surcharge for treated water deliveries). However, it is possible that the water being purchased would be in the amount that would put an agency beyond its Tier 1 limit. In that case, the base water rate will be the Tier 2 rate (plus Treatment Surcharge for treated water deliveries).
[21] Allocation Surcharge is applied to water use in excess of an agency's WSAP allocation.
[22] See Appendix K: Qualifying Income-Based Rate Allocation Surcharge Adjustment Example for specific penalty adjustment formulae and example.
[23] Appropriate documentation and certification will be required.

Tracking and Reporting

Subsequent to a declared regional shortage by the Board of Directors, Metropolitan staff will produce monthly reports of each member agency's water use compared to its allocations based on monthly delivery patterns to be submitted by the member agency. In order to produce these reports, member agencies are requested to submit their local supply use on a monthly basis and certify end of allocation year local supply use. These reports and comparisons are to be used for the purposes of tracking and communicating potential underage/overage of an agency's annual allocations.

Key Dates for Water Supply Allocation Implementation

The timeline for implementation of an allocation is shown in Table 3. A brief description of this timeline follows:

January to March: Water Surplus and Drought Management reporting occurs at Metropolitan's Water Planning and Stewardship Committee meetings. These reports will provide updated information on storage reserve levels and projected supply and demand conditions.

April: Member agencies report their projected local supplies for the coming allocation year. This information is incorporated in staff analysis of storage reserves and projected supply and demand conditions in order to provide an allocation recommendation to the Board. Metropolitan's Board will consider whether an allocation is needed. A declaration of an allocation will include the level of allocation to be in effect for the allocation year. Likewise, member agencies will report their projected demands and local supplies needed to meet seawater barrier and groundwater replenishment requirements for the allocation year. Metropolitan's Board will consider whether allocations for seawater barrier demands and groundwater replenishment demands are needed independently from the WSAP allocation decision.**July 1st**: If the Board declared an allocation in April, then it will be effective starting July 1st. The allocation level will be held through June 30th, barring unforeseen circumstances. Member agencies will now be requested to submit their local supply use on a monthly basis and certify end of allocation year local supply use. Local production data must be reported to Metropolitan by the end of the month following the month of use (use in July must be reported by the end of August). This information will be combined with Metropolitan sales information in order to track retail water use throughout Metropolitan's service area. Each month Metropolitan will report on member agency water sales compared to their allocation amounts.

June 30th: The allocation year is complete.

July: Member agency local supplies must be certified for the month of June, the last month of the previous allocation year.

August: Metropolitan will calculate each member agency's total potable water use based on local supply certifications and actual sales data for the allocation year of July through June. Allocation surcharges will be assessed for usage above a given member agency's final adjusted allocation (reflecting the actual local supply and imported water use that occurred in the allocation year).

Table 3: Board Adopted Allocation Timeline					
Year	**Month**	**Year 1 Board Decision**	**Year 1 Allocation Year**	**Year 2 Board Decision**	**Year 2 Allocation Year**
Year 1	January				
	February				
	March				
	April	Declaration *			
	May				
	June				
	July		**Effective Period** Continuous Tracking of Member Agency Local Supply and Imported Water Use		
	August				
	September				
	October				
	November				
	December				
Year 2	January				
	February				
	March				
	April			Declaration *	
	May				
	June				
	July				
	August		Assess		
	September				
	October				
	November				
	December				
Year 3	January				**Effective Period** Continuous Tracking of Member Agency Local Supply and Imported Water Use
	February				
	March				
	April				
	May				
	June				

*Member agency projections of local supplies are due on April 1st to assist Metropolitan staff in determining the need for an allocation in the coming allocation year.

Appendix A: Metropolitan Member Agencies

Table 4: Member Agencies		
City of Anaheim	City of Glendale	City of San Marino
City of Beverly Hills	Inland Empire Utilities Agency	City of Santa Ana
City of Burbank	Las Virgenes MWD	City of Santa Monica
Calleguas MWD	City of Long Beach	Three Valleys MWD
Central Basin MWD	City of Los Angeles	City of Torrance
City of Compton	MWD of Orange County	Upper San Gabriel MWD
Eastern MWD	City of Pasadena	West Basin MWD
Foothill MWD	San Diego CWA	Western MWD
City of Fullerton	City of San Fernando	

Source: http://mwdh2o.com/WhoWeAre/Member-Agencies/

Appendix B: Water Supply Allocation Plan Process Timeline

July 2007

- City of Long Beach Water Department staff briefing
- Member Agency Managers/Member Agency Workgroup meeting
- Northern Managers Group meeting
    - Foothill MWD, City of Pasadena, City of Long Beach, Calleguas MWD, City of Los Angeles, West Basin MWD, City of Burbank, Three Valleys MWD, City of Glendale, Upper San Gabriel MWD

August 2007

- Central Basin MWD staff briefing
- Eastern MWD staff briefing
- San Diego CWA staff briefing
- Member Agency Managers/Member Agency Workgroup meeting
- Western MWD staff briefing
- City of Beverly Hills staff briefing

September 2007

- Member Agency Subgroup meetings
    - MWD of Orange County, San Diego CWA, West Basin MWD, Central Basin MWD
- MWD of Orange County staff briefing
- Member Agency Workgroup meeting
- Member Agency Workgroup meeting
- MWD Board of Directors Oral Report

October 2007

- Inland Empire Utilities Agency staff briefing
- Central Basin MWD Caucus Meeting (included sub-agencies)
- Three Valleys MWD staff briefing
- MWD of Orange County staff briefing
- West Basin MWD staff briefing
- MWD Board of Directors Oral Report

November 2007

- West Basin MWD Caucus Meeting (included sub-agencies)
- West Basin Water Users Association presentation
- Walnut Valley MWD staff briefing (sub-agency of Three Valleys MWD)
- Foothill MWD Managers Meeting (included sub-agencies)
- Central Basin MWD staff briefing
- City of Claremont City Council (sub-agency of Three Valleys MWD)
- MWD Board of Directors Information Letter with Draft Proposal

December 2007

- Northern Managers Group Meeting
- California Department of Public Health staff briefing
- City of Long Beach Water Department staff briefing
- Santa Ana River Watershed Project Authority presentation
- Foothill MWD Managers Meeting (included sub-agencies)
- MWD Board of Directors Oral Report

January 2008

- Northern Managers Group Meeting
- Water Replenishment District Board of Directors presentation
- Three Valleys MWD staff briefing
- Member Agency Conservation Coordinator's Group presentation
- Member Agency Managers/Member Agency Workgroup meeting
- City of Chino Hills presentation (sub-agency of IEUA)
- Member Agency Workgroup meeting
- Hemet/San Jacinto Exchange Club presentation
- MWD Board of Directors Report with Staff Recommended Water Supply Allocation Plan

February 2008

- MWD of Orange County and Irvine Ranch WD staff briefing
- MWD Board of Directors Action Item
- San Gabriel Valley Water Association Meeting
- Orange County Water Policy Meeting
- SCAG Water Policy Task Force Meeting

Appendix C: 12-Month Review Process and Results

January 2010

- WSAP 12-Month Review Process workshop #1
  - Focused discussion of WSAP issues identified by Metropolitan staff and by member agencies since the July 2009 implementation began.

February 2010

- WSAP 12-Month Review Process workshop #2
  - Continuation of focused discussion
- WSAP 12-Month Review Process workshop #3
  - Continuation of focused discussion

March 2010

- WSAP 12-Month Review Process workshop #4
  - Continuation of focused discussion
- MWD Board of Directors information item
  - Review of potential modifications to the WSAP definition of Extraordinary Supply

April 2010

- WSAP 12-Month Review Process workshop #5
  - Recap of identified issues and discussion of Metropolitan staff proposals for adjustments to the WSAP
- Member Agency Managers Meeting
  - Update on the 12-Month Review Process
- WSAP 12-Month Review Process workshop #6
  - Discussion of WSAP issues related to groundwater replenishment
- Member Agency Managers conference call
  - Clarification of WSAP definition for Extraordinary Supply

May 2010

- Member Agency Managers Meeting
  - Discussion of proposed Extraordinary Supply policy principles and WSAP Local Supply certification process.
- Member Agency Managers conference call
  - Discussion of proposed Extraordinary Supply policy principles

June 2010

- MWD Board of Directors action item

July 2010

- MWD Board of Directors information item
  - Review of proposed adjustments to the WSAP developed in the 12-Month Review Process

August 2010

- MWD Board of Directors action item

Resulting Changes

- Removed references to Gains and Losses of Local Supply
    - Removed references in the WSAP to "gains and losses of local supplies" in order to better facilitate the accounting of historical base year and allocation year local supplies. This change did not affect the WSAP formula or allocations.
- Removed references to the Regional Shortage Percentage
    - Removed references to the "Regional Shortage Percentage" in the WSAP to reduce unintended confusion between calculation factors and shortage amounts. This change did not affect the WSAP formula or allocations.
- Included the Retail Impact Adjustment in all shortage levels
    - Included the Retail Impact Adjustment for Regional Shortage Levels 1 and 2. This change results in additional allocations to Metropolitan-dependent agencies under Level 1 and Level 2 regional shortages.
- Revised the accounting of Extraordinary Supplies
    - Revised the methodology for accounting of Extraordinary Supply in the WSAP formula by:
        - Removing the Base Period Local Supply threshold provision,
        - Removing the sliding-scale sharing mechanism from the formula, and
        - Including the full amount of the Extraordinary Supply in the calculation of the Retail Impact Adjustment.
- Included a Minimum Per Capita Water Use Threshold
    - Developed a minimum water use credit based on two GPCD water use thresholds. Member agencies would receive additional Metropolitan allocation for an acre-foot equivalent of GPCD below the minimum threshold. Member agency water use, on a gallon per capita per day (GPCD) basis, is compared to the following minimum thresholds established under Senate Bill X7-7 (Water Conservation Act of 2009)
        - 100 GPCD total use or
        - 55 GPCD residential indoor use
- Excluded Seawater Barrier from the WSAP Formula
    - Excluded seawater barrier supplies from the WSAP Base Period and Allocation Year local supply calculations. This allows the Board to determine allocations for seawater barrier demands separately from the WSAP.

Appendix D: Three-Year Review Process and Results

February 2011

- WSAP 3-Year Review Process workshop #1
  - Review of the existing WSAP policy formula; review of the process timeline; and focused discussion of WSAP issues identified by Metropolitan staff and by member agencies since the WSAP's adoption in February 2008

March 2011

- WSAP 3-Year Review Process workshop #2
  - Discussion of issues related to local supplies and baseline inflation due to adjustments for recycling in the WSAP formula
- WSAP 3-Year Review Process workshop #3
  - Continuation of prior workshop

April 2011

- WSAP 3-Year Review Process workshop #4
  - Discussion of issues and alternatives related to base period selection and baseline inflation in the WSAP formula
- WSAP 3-Year Review Process workshop #5
  - Discussion of recommendations to address baseline inflation in the WSAP formula

May 2011

- WSAP 3-Year Review Process workshop #6
  - Discussion of issues and alternatives for the growth adjustment methodology in the WSAP formula
- WSAP 3-Year Review Process workshop #7
  - Continuation of prior workshop

June 2011

- WSAP 3-Year Review Process workshop #8
  - Continuation of prior workshop, discussion of WSAP implementation exit strategy
- WSAP 3-Year Review Process workshop #9
  - Continuation of exit strategy discussion, discussion of baseline inflation due to conservation and related conservation demand hardening issues

July 2011

- WSAP 3-Year Review Process workshop #9
  - Continued discussion of baseline inflation and conservation issues, and discussion of sharing allocations between agencies with common local resources

August 2011

- WSAP 3-Year Review Process workshop #10
  - Discussion of WSAP Allocation Year timing vs. Tier 1-Tier 2 rate cycle timing, discussion of approaches for encouraging completion of WSAP local supply certifications
- Review WSAP at Member Agency Managers Meeting
  - Discussion of proposed WSAP adjustments to address baseline inflation issues, revise the growth adjustment methodology, and establish a WSAP exit strategy

ATTACHMENT B

September 2011

- MWD Board of Directors action item

Resulting Changes

- Baseline Inflation Adjustment
    - Removed non-potable recycling and conservation from the WSAP baseline
        - Increases in recycling and conservation will be subtracted annually from the Base Period forward
        - The annual population growth rate will be applied after deducting the annual increases in recycling and conservation
        - If an agency ends up in allocation penalty, a penalty reduction will be applied in an amount equal to the Code-Based and rate Structure conservation savings that were removed from the WSAP baseline
- Changed the Growth Adjustment methodology
    - Growth will be allocated at historical per capita rate capped at the 2010 Integrated Water Resource Plan (IRP) Target for Water Use Efficiency
        - For years up to and including 2014, the cap will be 163 GPCD
        - For years 2015-2020, the cap will reduce linearly from 163 to 145 GPCD
    - If an agency exceeds its allocation, a penalty reduction will be applied based on either:
        - The differential Evapotranspiration (ETo) of its service area compared to the MWD average, or
        - Certified and documented 20 x 2020 targeted GPCD
- Exit Strategy
    - Clarified the course of action for an existing WSAP allocation when Metropolitan's Board makes a declaration decision for the following WSAP year
        - If there is an allocation for the next year, then the current allocation stays in place
        - If there is no allocation for the next year, then the current allocation is lifted concurrent with the April decision

Appendix E: 2014 Review Process and Results

July 2014

- WSAP Workgroup Meeting #1
  - First meeting of the 2014 WSAP Review process; review of the existing WSAP policy and formula; review of the process timeline; began discussion of issues related to base period selection
- WSAP Workgroup Meeting #2
  - Discussion of base period selection

August 2014

- WSAP Workgroup Meeting #3
  - Continuation of prior workshop discussion; comparison of base period alternatives

September 2014

- WSAP Workgroup Meeting #4
  - Discussion of a base period proposal; discussion of replenishment issues in the WSAP; discussion of 2015 water supply scenarios
- Review WSAP at Member Agency Managers Meeting
  - Review of WSAP workgroup process; discussion on issues related to base period, demand hardening, and local resources development
- WSAP Workgroup Meeting #5
  - Review of base period recommendation; discussion of issues regarding agencies in mandatory conservation during a base period; discussion on replenishment in the WSAP

October 2014

- WSAP Workgroup Meeting #6
  - Continuation of prior workshop discussion; discussion of alternative methods for conservation demand hardening credit; discussion of new and existing local supplies
- Review WSAP at Member Agency Managers Meeting
  - Review of WSAP workgroup process; discussion of issues related to base period and demand hardening

November 2014

- WSAP Workgroup Meeting #7
  - Review and discussion of issues and potential methods for base period selection and adjustment, replenishment allocation, and conservation demand hardening credit; review of estimated effects of potential WSAP changes at the regional level
- WSAP Workgroup Meeting #8
  - Review of proposed recommendations for the WSAP based on workgroup discussion
- Review WSAP at Member Agency Managers Meeting
  - Review of proposed recommendations for the WSAP based on workgroup discussion

Resulting Changes

- Base Period Update to FY2013 and FY2014
    - Changed the WSAP Base Period from calendar years 2004-2006 to fiscal years ending July 2013 and 2014
    - Mandatory Conservation Adjustment
        - Agencies with mandatory conservation in effect during the base period (FY 2013 and/or FY 2014) may qualify for a demand hardening adjustment, adjustment is subject to a consultation process that includes consideration historical demand and GPCD information

- Modify Conservation Demand Hardening Credit
    - Replaced device calculation-based estimates of conservation savings with a GPCD-based method
        - Conservation savings are calculated by comparing GPCD from a historical baseline to the Allocation Year; the difference is converted to acre-feet using the Allocation Year population.
            - Baseline GCPD is 10-year average ending between 2004 and 2010, with gross water, using gross water use minus non-potable recycled water production and documented historical population
    - Replaced formula for calculating the credit for each Regional Shortage Level
    - Conservation Demand hardening credit will be based on an initial 10 percent of GPCD-based conservation savings plus an additional 5 percent for each level of Regional Shortage; the credit will also be adjusted for the overall percentage reduction in retail water demand and the member agency's dependence on Metropolitan.
- Allocation Surcharge
    - Replaced the WSAP Penalty Rate with an Allocation Surcharge based on the estimated cost of Turf Replacement conservation programs

Appendix F: Summary of Historical Shortage Plans

These five elements incorporated into the WSAP have, in four out of five instances, been used in previous shortage plans. Both the IICP and the 1995 DMP used a historical base period calculation, adjusted for growth, made local supply adjustments, and used conservation hardening credits in their formulations. The retail impact adjustment is the only feature of the WSAP that has not been used historically.

Table 5: Historical Shortage Plan Overview

Plan Element	1991 IICP	1995 DMP	WSAP
Historical Base Period	√	√	√
Growth Adjustment	√	√	√
Local Supply Adjustment	√	√	√
Conservation Hardening Credit	√	√	√
Retail Impact Adjustment			√

Appendix G: Water Supply Allocation Formula Example

The following example gives a step-by-step description of how the formula would be used to calculate an allocation of Metropolitan supplies for a hypothetical member agency. All numbers are hypothetical for the purpose of the example and do not reflect any specific member agency.

Step 1: Calculate Base Period Retail Demand

Base Period Local Supplies: Calculated using a two-year average of groundwater (gw), groundwater recovery (gwr), Los Angeles Aqueduct supply (laa), surface water (sw), seawater desalination (sd), and other non-Metropolitan imported supplies (os). For the purpose of this example, assume that the two year average is 59,000 af.

$$[(gw1+gwr1+laa1+sw1+sd1+os1) + (gw2+gwr2+laa2+sw2+sd2+os2)] \div 2 = 59{,}000 \text{ af}$$

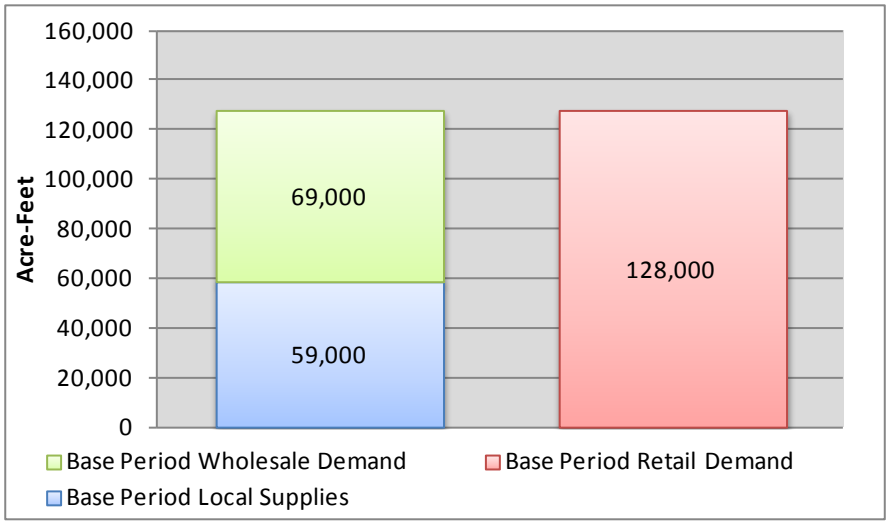
Base Period Wholesale Demands: Calculated using the same two-year time period as the Base Period Local Supplies. The Base Period Wholesale Demands include firm purchases (fp) and in-lieu deliveries to long-term groundwater replenishment (il), conjunctive use (cup), cyclic (cyc), and supplemental storage programs (ss). For the purpose of this example, assume that the two year average is 69,000 af.

$$[(fp^1++il^1+cup^1+cyc^1+ss^1) + (fp^2+il^2+cup^2+cyc^2+ss^2)] \div 2 = 69{,}000 \text{ af}$$

Base Period Retail Demands: Calculated as the sum of the Base Period Local Supplies and Base Period Wholesale Demand.

$$59{,}000 + 69{,}000 = 128{,}000 \text{ af}$$

Figure 1: Base Period Retail Demand Calculation



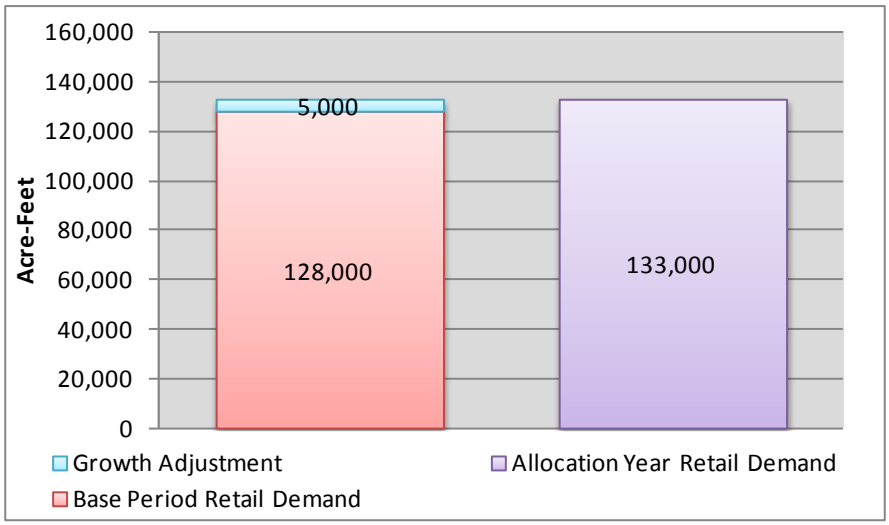
Calculate Adjustment for Base Period Mandatory Rationing (if applicable): The hypothetical agency used in this example is assumed not to qualify for the Base Period Mandatory Rationing Adjustment. A detailed discussion of the adjustment methodology can be found in Appendix I: Base Period Rationing Adjustment Example.

Step 2: Calculate Allocation Year Retail Demand

Allocation Year Retail Demand: Calculated by adjusting the Base Period Retail Demand for any baseline inflation and growth that occurred since the Base Period.

128,000 af + 5,000 af (net adjustment to retail demand) = 133,000 af

Figure 2: Allocation Year Retail Demand Calculation



Step 3: Calculate Allocation Year Wholesale Demand

Allocation Year Local Supplies: Estimates of Allocation Year Local Supplies are provided by the member agencies upon implementation of a WSAP. If estimates are not provided, Metropolitan will use the sum of the Base Period Local Supplies and Base Period In-Lieu Deliveries as a default. Agencies may provide updated estimates at any time during the Allocation Year to more accurately reflect their demand for Metropolitan supplies. For this example assume that the Allocation Year Local Supplies total 65,000 acre-feet.

Allocation Year Local Supplies = 65,000 af

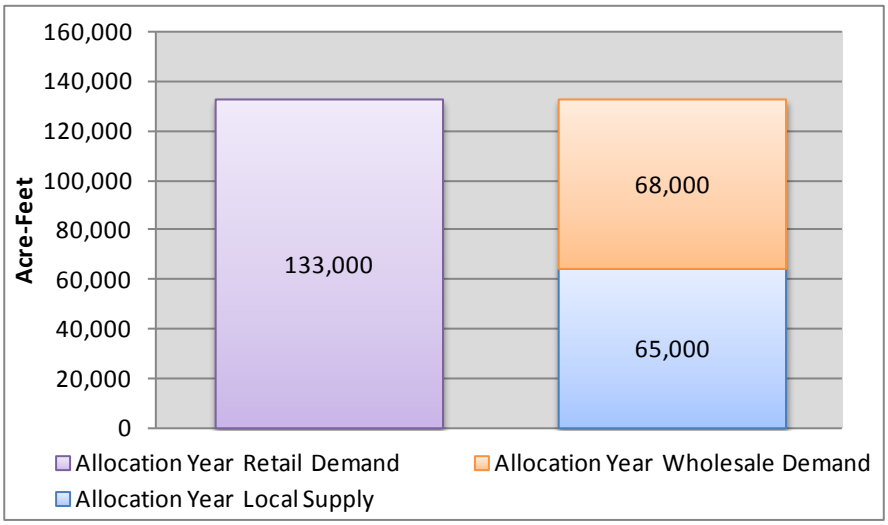
For this example assume also that this agency has an additional 5,000 acre-feet of supplies that meet the determinations for Extraordinary Supply. These supplies are withheld from the allocation formula except for in calculating the Retail Impact Adjustment Allocation.

Extraordinary Local Supplies = 5,000 af

Allocation Year Wholesale Demands: Calculated by subtracting the Allocation Year Local Supplies (65,000 af) from the Allocation Year Retail Demands (133,000 af).

133,000 af - 65,000 af = 68,000 af

Figure 3: Allocation Year Wholesale Demand Calculation



Step 4: Calculate the Wholesale Minimum Allocation

Wholesale Minimum Percentage: Calculate from Table 1 for Regional Shortage Level 4.

Table 1: Shortage Allocation Index		
(a) Regional Shortage Level	(b) Wholesale Minimum Percentage	(c) Maximum Retail Impact Adjustment Percentage
4	70.0%	10.0%

Wholesale Minimum Allocation: Calculated by multiplying the agency's Allocation Year Wholesale Demand (68,000 af) by the Wholesale Minimum Percentage (70%) from the Table 1 for Regional Shortage Level 4.

68,000 af * 70% = 47,600 af

Step 5: Calculate the Retail Impact Adjustment Allocation

Maximum Retail Impact Adjustment Percentage: Calculate from Table 1 for Regional Shortage Level 4.

Retail Impact Adjustment Allocation: Calculated first by determining the agency's dependence on Metropolitan by dividing the Allocation Year Wholesale Demand (68,000 af) minus the Extraordinary Supply (5,000 af) by the Allocation Year Retail Demand (133,000 af) and multiplying by 100.

[(68,000 af - 5,000 af)/ 133,000 af] * 100 = 47%

Next, this percentage dependence on Metropolitan (47%) is multiplied by the Maximum Retail Impact Percentage for Shortage Level 4 (10%).

47% * 10% = 4.7%

This percentage is now multiplied by the Allocation Year Wholesale Demand (68,000 af) for the Retail Impact Adjustment Allocation.

68,000 af * 4.7% = 3,221 af

Step 7: Calculate the Conservation Demand Hardening Adjustment

Calculate Baseline GPCD: To estimate conservation savings, each member agency will establish a historical baseline GPCD calculated in a manner consistent with California Senate Bill SBx7-7, using a 10 or 15-year average ending between 2004 and 2010, using gross water use minus non-potable recycle water production and documented historical population. For this example assume that the Baseline GPCD is 154 GPCD

Baseline GPCD = 154 GPCD

Calculate Allocation Year GPCD: Next, calculate the allocation year GPCD by converting the Allocation Year Retail Demand to GPCD and dividing by the Allocation Year Population from the WSAP. For this example the Allocation Year Retail Demand is 133,000 AF (see Step 2 above) and assume the Allocation Year Population is 905,000 persons. The resulting GPCD is 131 GPCD.

Allocation Year GPCD = 133,000 af/year * 325,851 gallons/af ÷ 365 days/year ÷ 905,000 persons = 131 GPCD

Calculate Reduction in GPCD: Subtract Allocation Year GPCD from Baseline GPCD to determine the GPCD Reduction.

GPCD Reduction = 154 GPCD – 131 GPCD = 23 GPCD

Calculate Conservation Savings: Convert the GPCD Reduction to the equivalent annual conservation savings in acre-feet, using the Allocation Year Population.

$$\text{Conservation Savings} = \frac{(\text{GPCD Reduction}) \times 365 \text{ days/yr} \times \text{Population})}{325{,}851 \text{ gallons/af}}$$

Conservation Savings = 23 x 365 x 905,000 ÷ 325,851 = 23,316 af

Multiply by Regional Shortage Level Percentage: Multiply the Conservation Savings by 10 percent plus an additional 5 percent for each level of Regional Shortage (see Step 4 above). This example assumes a Regional Shortage Level of 4. This scales the hardening credit by the level of regional shortage, thereby increasing the credit as deeper shortages occur when demand hardening has a larger impact on the retail consumer.

23,316 af x (10% + (4 x 5%) = 6,995 af

Multiply by Conservation Savings Percentage: Next, multiply by the percentage of an agency's demand that was reduced through conservation. This scales the hardening by the total percentage reduction to recognize that increased hardening occurs as increasing amounts of conservation are implemented.

Conservation Savings Percentage = 1 + ((Baseline GPCD – Allocation Year GPCD)/Baseline GPCD)

Conservation Savings Percentage = 1+ ((154 GPCD – 131 GPCD)/154 GPCD) = 115%

6,995 af x 115% = 8,044 af

Multiply by Dependence on MWD: Next, multiply by the agency's percentage dependence on MWD as shown in Step 5 above. This scales the credit to the member agency's dependence on MWD to ensure that credits are being applied to the proportion of water demand that is being affected by reductions in MWD's supply. For this example, dependence on MWD is 47%.

8.044 af x 47% = 3,781 af

Summary: The Conservation Demand Hardening Adjustment calculation is summarized by the following formula:

Conservation Demand Hardening Adjustment = Conservation Savings x (10% + Regional Shortage Level %) x (1+Conservation%) x Dependence on MWD %

Conservation Demand Hardening Adjustment = 23,316 af x (10% + (4 x 5%)) x (115%) x (47%) = 3,781 af

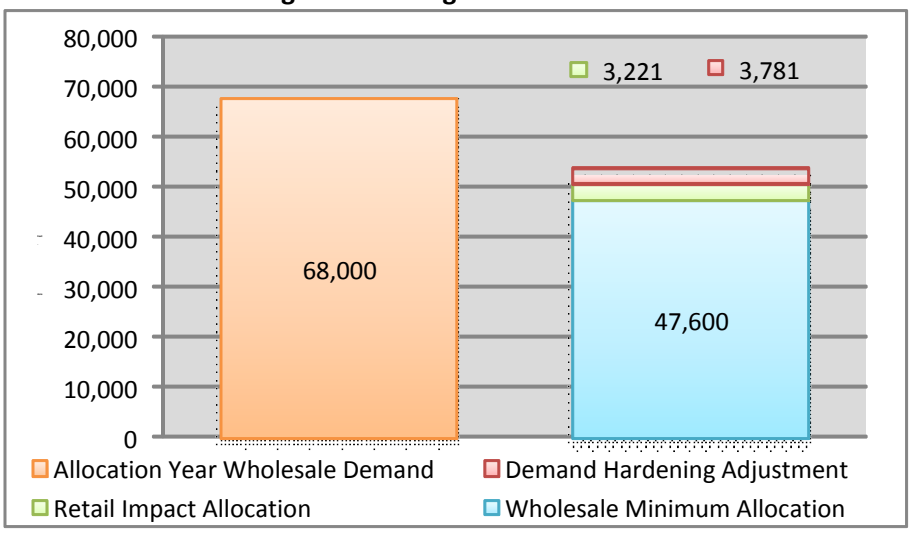
Step 8: Calculate the Low Per-Capita Adjustment Allocation: The hypothetical agency used in this example is assumed not to qualify for the Low Per-Capita Adjustment. A detailed discussion and example of the Low Per-Capita Adjustment calculation can be found in Appendix J: Per Capita Water Use Minimum Example.

Step 9: Calculate the total WSAP Allocation

WSAP Allocation: Calculated by adding the Wholesale Minimum Allocation (47,600 af), the Maximum Retail Impact Adjustment (3,221 af), the Demand Hardening Adjustment (3,781 af), and the Low Per-Capita Adjustment (0 af).

47,600 af + 3,221 af + 3,781 af + 0 af = 54,602 af

Figure 4: WSAP Allocation Regional Shortage Level 4



Step 10: Calculate total retail level reliability

Retail level reliability: Calculated by adding the WSAP Allocation (54,602 af), the Allocation Year Local Supply (65,000 af) and the Extraordinary Local Supply (5,000 af) and dividing by the Allocation Year Retail Demand (133,000 af).

(54,602 af + 65,000 af + 5,000 af) ÷ 133,000 af = 93.7%

Total Metropolitan Supply Allocations: In addition to the WSAP Allocation described above, agencies may also receive separate allocations of supplies for groundwater replenishment and seawater barrier demands. More information on the groundwater replenishment allocation is located in Appendix L: Groundwater Replenishment Allocation.

Appendix H: Board Policy Principles on Determining the Status of Extraordinary Supply

At the June 8, 2010 Water Planning and Stewardship Committee meeting Metropolitan's Board of Directors adopted the following policy principles to guide staff in determining the Extraordinary Supply status of future member agency supply programs.

No Negative Impacts to Other Member Agencies

A potential Extraordinary Supply for a member agency should not decrease the amount of Metropolitan water supply that would be available to the other member agencies in a WSAP. Programs that utilize Metropolitan supplies as a primary or in-lieu source or as a means of payback or future replenishment may have the effect of decreasing supplies, available to other agencies, if designated as Extraordinary Supply.

Provides Supply in Addition to Existing Regional Supplies

A potential Extraordinary Supply should provide a water supply that increases the overall water supplies that are available to the region in a WSAP. A program that is designed to move existing regional supplies from year to year would not qualify.

Specifically Designed Program or Supply Action

A potential Extraordinary Supply must be intentionally created and operated to provide additional supply yield. Normal variations in existing and planned local supply programs would not qualify.

Intended for Consumptive Use in a WSAP

A potential Extraordinary Supply should be designed with the primary intention to deliver water supply to a member agency only at a time when Metropolitan is allocating supplies. Programs designed to deliver water on a regular basis would not qualify. Exceptions for reasonable use of a supply program for emergency or other extenuating local circumstances should be considered.

Fully Documented Resource Management Actions

A potential Extraordinary Supply should have a full description as to the source, transmission, distribution, storage, and delivery of the water supply.

These principles are intended to identify deliberate actions taken by member agencies to augment supplies only when Metropolitan is allocating supplies through the WSAP. Production from existing local supplies, programs that are operated on an ongoing basis, and incidental increases in water supply would not qualify as Extraordinary Supply. The intent of the Extraordinary Supply designation is to recognize programs and actions that are additive to the total regional water supply as the region continues to confront the water supply challenges from drought and regulatory conditions. To that end, any supply actions taken after the initial implementation of the WSAP in July 2009 that utilize Metropolitan supplies either as a primary source, or to refill or replenish an incurred obligation or deficit at a future date would not qualify as Extraordinary Supply.

Appendix I: Base Period Mandatory Rationing Adjustment

Agencies that were under mandatory water use restrictions during the Base Period may have water use that is lower due to the mandatory actions already taken. Without adjusting for this, those agencies could be required to enforce even higher levels of restrictions under an allocation than those agencies that had not started mandatory restrictions.

To qualify for a Base Period Mandatory Rationing Adjustment, the member agency must provide Metropolitan staff with the following information:

- Time period when the mandatory conservation was in effect; it must be in effect during the Base Period
- A statement, with documentation, of how drought restrictions comply with the following Mandatory Conservation qualifications:
    - Governing Body-authorized or enacted
    - Includes mandatory demand reduction actions, restrictions or usage limitations including penalty-backed water budgets
    - Enforced by assessing penalties, fines, or rates based upon violating restrictions or exceeding usage limitations
- If the agency in question is a retail subagency, then the retailer's base period water demands during the Base Period in order to determine proportion to the member agency's total demand
- Historical data to construct GPCD base and trend for the consultation

Calculating the Base Period Rationing Adjustment involves following steps:

- Use the Baseline GPCD 10 or 15-year period selected by member agency for the Conservation Demand Hardening Adjustment calculation.
- Interpolate from the GPCD value of the midpoint of the Baseline GPCD period to the average GPCD of the two years preceding the agency's mandatory conservation
- Extrapolate to the WSAP Base Period (FY2013 and FY2014)
- Calculate the difference between estimated and observed GPCD for FY2013 and FY2014
- Convert to Acre-Feet and add to the member agency's Base Period Retail Demands

Appendix J: Per-Capita Water Use Minimum Example

This adjustment creates a minimum per capita water use threshold. Member agencies' retail-level water use under the WSAP is compared to two different thresholds. The minimum water use levels are based on compliance guidelines for total and residential water use established under Senate Bill X7-7.

Total Retail Level Use: 100 GPCD
Residential Retail Level Use: 55 GPCD

Agencies that fall below either threshold under the WSAP would receive additional allocation from Metropolitan to bring them up to the minimum GPCD water use level. To qualify for this credit, member agencies must provide documentation of the total agency level population and the percent of retail level demands that are residential; no appeal is necessary.

The following example gives a step-by-step description of how the Low Per-Capita Water Use Adjustment would be calculated for a hypothetical member agency. All numbers are hypothetical for the purpose of the example and do not reflect any specific member agency. This example was calculated using the following assumptions:

Allocation Year Retail Demand: 50,000 acre-feet
Allocation Year Local Supplies: 25,000 acre-feet;
Allocation Year Wholesale Demand: 25,000 acre-feet
Base Period Conservation: 5,000 acre-feet
Agency Population: 375,000
Percent of Retail Demands that are Residential: 60%

Step 1: Calculate Total Retail-Level Allocation Year Supplies

Table 6 shows the Allocation Year Local Supply, WSAP Allocation, and the total Allocation Year Supplies for the example agency at each Regional Shortage Level. The WSAP Allocation was calculated using the methodology detailed in Appendix G: Water Supply Allocation Formula Example and the assumptions listed above.

Table 6: Total Retail Level Allocation Year Supplies			
Regional Shortage Level	**Allocation Year Local Supply**	**WSAP Allocation**	**Total Allocation Year Supply**
1	25,000	23,594	48,594
2	25,000	22,188	47,188
3	25,000	20,781	45,781
4	25,000	19,375	44,375
5	25,000	17,969	42,969
6	25,000	16,563	41,563
7	25,000	15,156	40,156
8	25,000	13,750	38,750
9	25,000	12,344	37,344
10	25,000	10,938	35,938

Step 2: Calculate the Equivalent Total and Residential GPCD

The next step is to calculate the equivalent water use in gallons per capita per day (GPCD) for the Total Allocation Year Supply. The following equation shows the GPCD calculation under Regional Shortage Level 10.

35,938 af * 325,851 gallons ÷ 375,000 people ÷ 365 days = 85.6 GPCD

The residential per-capita water use is calculated in the same manner. Based on the assumption that 60% of the agency demands are residential, the following equation shows the residential GPCD calculation under Regional Shortage Level 10.

35,938 af * 60% * 325,851 gallons ÷ 375,000 people ÷ 365 days = 51.3 GPCD

Step 3: Compare the Total and Residential GPCD to the Minimum Water Use Thresholds

The next step is to compare the total GPCD water use to the 100 GPCD total water use threshold. In a Regional Shortage Level 10, the WSAP results in an allocation that is 14.4 GPCD below the minimum threshold.

100 GPCD – 85.6 GPCD = 14.4 GPCD

Likewise the residential GPCD water use is compared to the 55 GPCD residential water use threshold.

55 GPCD – 51.3 GPCD = 3.7 GPCD

Step 4: Determine the Allocation Adjustment in Acre-Feet

The final step is to calculate the acre-foot equivalent of the GPCD that fell below the minimum threshold. In a Regional Shortage Level 10, the adjustment provides 6,068 acre-feet of additional allocation to the agency; the results for Shortage Levels 1-10 are shown in Table 7.

14.4 GPCD ÷ 325,851 gallons * 375,000 people * 365 days = 6,068 acre-feet

Table 7: Total Per-Capita Water Use Adjustment				
Regional Shortage Level	**Allocation Year Supply**	**Equivalent GPCD**	**GPCD Below Threshold**	**Allocation Adjustment**
1	48,594	115.7	0	0
2	47,188	112.3	0	0
3	45,781	109.0	0	0
4	44,375	105.6	0	0
5	42,969	102.3	0	0
6	41,563	98.9	1.1	443
7	40,156	95.6	4.4	1,849
8	38,750	92.3	7.7	3,255
9	37,344	88.9	11.1	4,662
10	35,938	85.6	14.4	6,068

Again, this step is repeated for the residential water use. In a Regional Shortage Level 10, the adjustment provides 1,540 acre-feet of additional allocation to the agency; the residential water use results for Regional Shortage Levels 1-10 are shown in Table 8.

3.7 GPCD ÷ 325,851 gallons * 375,000 people * 365 days = 1,540 acre-feet

Table 8: Residential Per-Capita Water Use Adjustment				
Regional Shortage Level	**Allocation Year Supply**	**Equivalent GPCD**	**GPCD Below Threshold**	**Allocation Adjustment**
1	29,156	69.4	0	0
2	28,313	67.4	0	0
3	27,469	65.4	0	0
4	26,625	63.4	0	0
5	25,781	61.4	0	0
6	24,938	59.4	0	0
7	24,094	57.4	0	0
8	23,250	55.4	0	0
9	22,406	53.3	1.7	697
10	21,563	51.3	3.7	1,540

Agencies that fall below either threshold under the WSAP would receive additional allocation from Metropolitan to bring them up to the minimum GPCD water use level. If an agency qualifies under both thresholds, the one resulting in the maximum allocation adjustment would be given. Under this example the agency would receive 6,068 acre-feet of additional allocation in a Regional Shortage Level 10.

Appendix K: Qualifying Income-Based Rate Allocation Surcharge Adjustment Example

The following example provides a step by step description of how the qualifying income-based rate allocation surcharge adjustment is calculated. To qualify for this adjustment, member agencies must provide documentation showing the amount of retail demands that are covered by a qualifying income-based rate; no appeal is necessary.

The following list summarizes the allocation year demands, local supplies, and allocation as calculated in Appendix G: Water Supply Allocation Formula Example for a hypothetical agency under a Level 4 Regional Shortage. For detailed instructions on how to calculate these figures, reference Appendix G: Water Supply Allocation Formula Example.

Allocation Year Retail Demand: 133,000 acre-feet
Allocation Year Local Supplies: 68,000 acre-feet;
Level 4 WSAP Allocation: 52,735 acre-feet

Step 1: Allocation Surcharge Calculation

(a) **Water Use above Allocation:** The first step in calculating the income-based rate Allocation Surcharge adjustment is to calculate the agency's total Allocation Surcharge under the WSAP. If the agency did not incur any Allocation Surcharge from the allocation year, the income-based rate allocation surcharge adjustment would not apply. For the purpose of this example, the agency used 61,000 acre-feet of MWD supplies in the allocation year. This represents 8,265 acre-feet of use above the water supply allocation.

WSAP Allocation	52,735 af
Actual MWD Water Use	61,000 af
Use Above WSAP Allocation	8,265 af

(b) **Total Allocation Surcharge:** In this example the agency used 115.7% of its water supply allocation. 7,910 of the 8,265 acre-feet of use above the allocation would be assessed the Allocation Surcharge at an amount of $1,480 per acre-foot and 354 of the 8,265 acre-feet of use above the allocation would be assessed the Allocation Surcharge at an amount of $2,960.

Between 100% and 115% of Allocation	7,910 af	$1,480/af	$11,706,800
Greater than 115% of Allocation	354 af	$2,960/af	$1,047,840
Total	8,265 af		$12,754,640

Step 2: Effective Income-Based Rate Cutback

(a) **Calculate Retail Cutback:** The second step in calculating the income-based rate allocation surcharge adjustment is to calculate the amount of supply cutback that would have been expected from qualifying income-based rate customers under the WSAP. Using the water supply allocation that was calculated above, the total retail level impact on the agency can be

determined. In this example the agency receives a retail level cutback of 15,265 acre-feet, or 11.5% of their retail level demand.

WSAP Allocation + Allocation Year Local Supplies	117,735 af
Allocation Year Retail Demand	133,000 af
Effective Cutback	**15,265 af (11.5%)**

(b) Income-based Rate Customer Retail Cutback: To calculate the effective income-based rate cutback, the amount of demand covered by a qualifying income-based rate is multiplied by the effective retail level cutback. For this example assume that the agency has 10,000 acre-feet of qualifying demands.

Qualifying Income-Based Rate Demand	10,000 af
Effective Cutback Percentage	11.5%
Effective Income-Based Rate Cutback	**1,148 af**

(c) Income-based Rate Cutback Allocation Surcharge: Once the effective cutback has been calculated, the amount of Allocation Surcharge that is associated with qualifying income-based rate customers can be determined.

Between 100% and 115% of Allocation	794 af	$1,480/af	$1,175,120
Greater than 115% of Allocation	354 af	$2,960/af	$1,047,840
Total	**1,148 af**		**$2,222,960**

(d) Adjusted Allocation Surcharge Calculation: Finally, the Allocation Surcharge attributable to qualifying income-based rate customers is subtracted from the total Allocation Surcharge that was calculated above to determine the qualifying income-based rate adjusted allocation surcharge. In the case that the monetary amounts associated with the Income-Based Rate are greater than the total amounts an agency incurs, no Allocation Surcharge will be incurred.

Total Allocation Surcharge	$12,754,640
Qualifying Income-Based Rate Allocation Surcharge	$2,222,960
Qualifying Income-Based Rate Adjusted Allocation	**$10,531,680**

Appendix L: Groundwater Replenishment Allocation

Groundwater basins help provide vital local supplies that can buffer the region from short-term drought impacts. Longer droughts can result in reductions to the many sources of water that replenish groundwater basins, resulting in lower basin levels and potential impacts to the overlying consumptive demands. Limited imported deliveries under these conditions may help avoid impacts to the basins that may be drawn out of their normal operating range or subject to water quality or regulatory impacts. To this end, Metropolitan provides a limited allocation for drought impacted groundwater basins based on the following framework:

a) Staff hold a consultation with qualifying member agencies who have taken groundwater replenishment deliveries since 2010 and the appropriate groundwater basin managers to document whether their basins are in one of the following conditions:
    i. Groundwater basin overdraft conditions that will result in water levels being outside normal operating ranges during the WSAP allocation period; or
    ii. Violations of groundwater basin water quality and/or regulatory parameters that would occur without imported deliveries.
b) Provide an allocation based on the verified need for groundwater replenishment. The allocation would start with a member agency's ten-year average purchases of imported groundwater replenishment supplies (excluding years in which deliveries were curtailed). The amount would then be reduced by the declared WSAP Regional Shortage Level (5 percent for each Regional Shortage Level).
c) Any allocation provided under this provision for drought impacted groundwater basins is intended to help support and maintain groundwater production for consumptive use. As such, a member agency receiving an allocation under this provision will be expected to maintain groundwater production levels equivalent to the average pumping in the Base Period. Any adjustments to a member agency's M&I allocation due to lower groundwater production would be reduced by deliveries made under this provision.
d) Agencies for which this allocation does not provide sufficient supplies for the needs of the groundwater basin may use the WSAP Appeals Process to request additional supply (subject to Board approval). The appeal should include a Groundwater Management Plan that documents the need for additional supplies according to the following tenets:
    i. Maintenance of groundwater production levels;
    ii. Maintenance of, or reducing the further decline of, groundwater levels;
    iii. Maintenance of key water quality factors/indicators;
    iv. Avoidance of permanent impacts to groundwater infrastructure or geologic features; and
    v. Consideration of severe and/or inequitable financial impacts.

Final amounts and allocations will be determined following the consultations with groundwater basin managers and member agencies.

Appendix M: Water Rates, Charges, and Definitions

Table 9: Water Rates and Charges Dollars per acre-foot (except where noted)			
Rate	**Effective 1/1/2014**	**Effective 1/1/2015**	**Effective 1/1/2016**
Tier 1 Supply Rate	$148	$158	$156
Tier 2 Supply Rate	$290	$290	$290
System Access Rate	$243	$257	$259
Water Stewardship Rate	$41	$41	$41
System Power Rate	161	$126	$138
Tier 1	$593	$582	$594
Tier 2	$735	$714	$728
Treatment Surcharge	$297	$341	$348
Full Service Treated Volumetric Cost			
Tier 1	$890	$923	$942
Tier 2	$1,032	$1,055	$1,076
Readiness-to-Serve Charge (millions of dollars)	$166	$158	$153
Capacity Charge (dollars per cubic foot second)	$8,600	$11,100	$10,900

Definitions:

(1) **Tier 1 Supply Rate -** recovers the cost of maintaining a reliable amount of supply.
(2) **Tier 2 Supply Rate** - set at Metropolitan's cost of developing additional supply to encourage efficient use of local resources**.**
(3) **System Access Rate** – recovers a portion of the costs associated with the delivery of supplies.
(4) **System Power Rate** – recovers Metropolitan's power costs for pumping supplies to Southern California.
(5) **Water Stewardship Rate** – recovers the cost of Metropolitan's financial commitment to conservation, water recycling, groundwater clean-up and other local resource management programs.
(6) **Treatment Surcharge** – recovers the costs of treating imported water.
(7) **Readiness-to-Serve Charge -** a fixed charge that recovers the cost of the portion of system capacity that is on standby to provide emergency service and operational flexibility.
(8) **Capacity Charge** – the capacity charge recovers the cost of providing peak capacity within the distribution system.

Source: http://www.mwdh2o.com/WhoWeAre/Management/Financial-Information

Appendix N: Allocation Appeals Process

Step 1: Appeals Submittal

All appeals shall be submitted to the Appeals Liaison in the form of a written letter signed by the member agency General Manager. Each appeal must be submitted as a separate request, submittals with more than one appeal will not be considered. The appeal request is to include:

- A designated member agency staff person to serve as point of contact.
- The type of appeal (erroneous baseline data, loss of local supply, etc.).
- The quantity (in acre-feet) of the appeal.
- A justification for the appeal which includes supporting documentation.

A minimum of 60 days are required to coordinate the appeals process with Metropolitan's Board process.

Step 2: Notification of Response and Start of Appeals Process

The Appeals Liaison will phone the designated member agency staff contact within 3 business days of receiving the appeal to provide an initial receipt notification, and schedule an appeals conference. Subsequent to the phone call, the Liaison will send an e-mail to the Agency General Manager and designated staff contact documenting the conversation. An official notification letter confirming both receipt of the appeal submittal, and the date of the appeals conference, will be mailed within 2 business days following the phone contact

Step 3: Appeals Conference

All practical efforts will be made to hold an appeals conference between Metropolitan staff and member agency staff at Metropolitan's Union Station Headquarters within 15 business days of receiving the appeal submittal. The appeals conference will serve as a forum to review the submittal materials and ensure that there is consensus understanding as to the spirit of the appeal. Metropolitan staff will provide an initial determination of the size of the appeal (small or large) and review the corresponding steps and timeline for completing the appeals process.

Steps 4-7 of the appeals process differ depending upon the size of the appeal

Small Appeals

Small appeals are defined as those that would change an agency's allocation by less than 10 percent, or are less than 5,000 acre-feet in quantity. Small appeals are evaluated and approved or denied by Metropolitan staff.

Step 4: Preliminary Decision

Metropolitan staff will provide a preliminary notice of decision to the member agency within 10 business days of the appeals conference. The preliminary decision timeline may be extended to accommodate requests for additional information, data, and documentation. The Appeals Liaison will mail a written letter to the member agency staff contact and General Manager, stating the preliminary decision and the rationale for approving or denying the appeal.

Step 5: Clarification Conference

Following the preliminary decision the Appeals Liaison will schedule a clarification conference. The member agency may choose to decline the clarification conference if they are satisfied with the preliminary decision. Declining the clarification conference serves as acceptance of the preliminary decision, and the decision becomes final upon approval by Metropolitan's executive staff.

Step 6: Final Decision

Metropolitan staff will provide a final notice of decision to the member agency within 10 business days of the clarification conference, pending review by Metropolitan's executive staff. The Appeals Liaison will mail a written letter to the member agency staff contact and General Manager, stating the final decision and the rationale for the decision. A copy of the letter will also be provided to Metropolitan executive staff.

Step 6a: Board Resolution of Small Appeal Claims

Member agencies may request to forward appeals that are denied by Metropolitan staff to the Board of Directors through the Water Planning and Stewardship Committee for final resolution. The request for Board resolution shall be submitted to the Appeals Liaison in the form of a written letter signed by the member agency General Manager. This request will be administered according to Steps 6 and 7 of the large appeals process.

Step 7: Board Notification

Metropolitan staff will provide a report to the Board of Directors, through the Water Planning and Stewardship Committee, on all submitted appeals including the basis for determination of the outcome of the appeal.

Large Appeals

Large appeals are defined as those that would change an agency's allocation by more than 10 percent, and are larger than 5,000 acre-feet. Large appeals are evaluated and approved or denied by the Board of Directors.

Step 4: Preliminary Recommendation

Metropolitan staff will provide a preliminary notice of recommendation to the member agency within 10 business days of the appeals conference. The preliminary decision timeline may be extended to accommodate requests for additional information, data, and documentation. The Appeals Liaison will mail a written letter to the member agency staff contact and General Manager, stating the preliminary recommendation and the rationale for the recommendation. A copy of the draft recommendation will also be provided to Metropolitan executive staff.

Step 5: Clarification Conference

Following the preliminary recommendation the Appeals Liaison will schedule a clarification conference. The member agency may choose to decline the clarification conference if the satisfied with preliminary recommendation. Declining the clarification conference signifies acceptance of the preliminary recommendation, and the recommendation becomes final upon approval by Metropolitan's executive staff.

Step 6: Final recommendation

Metropolitan staff will provide a final notice of recommendation to the member agency within 10 business days of the clarification conference, pending review by Metropolitan executive staff. The Appeals Liaison will mail a written letter to the member agency staff contact and General Manager, stating the final recommendation and the rationale for the recommendation. A copy of the final recommendation will also be provided for Metropolitan executive review.

Step 7: Board Action

Metropolitan staff shall refer the appeal to the Board of Directors through the Water Planning and Stewardship Committee for approval.

Appendix O: Appeals Submittal Checklist

Appeal Submittal

- ☐ Written letter (E-mail or other electronic formats will not be accepted)
- ☐ Signed by the Agency General Manager

Mailed to the appointed Metropolitan Appeals Liaison

Contact Information

- ☐ Designated staff contact
  - o Name
  - o Address
  - o Phone Number
  - o E-mail Address
- ☐ General Manager
  - o Name
  - o Address
  - o Phone Number
  - o E-mail Address

Type of Appeal

- ☐ State the type of appeal
  - o Erroneous historical data used in base period calculations
    - Metropolitan Deliveries
    - Local Production
    - Growth adjustment
    - Conservation savings
  - o Exclusion of physically isolated areas
  - o Extraordinary supply designation
  - o Groundwater Replenishment Allocation
  - o Base Period Mandatory Rationing Adjustment
  - o Other

Quantity of Appeal

- ☐ State the quantity in acre-feet of the appeal

Justification and Supporting Documentation

- ☐ State the rationale for the appeal
- ☐ Provide verifiable documentation to support the stated rationale
  - o Examples of verifiable documentation Include, but are not limited to:
    - Billing Statements
    - Invoices for conservation device installations
    - Basin Groundwater/Watermaster Reports
    - California Department of Finance economic or population data
    - California Department of Public Health reports

ATTACHMENT C

Resolution XXXX

**RESOLUTION
OF THE BOARD OF DIRECTORS
OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
ADOPTING THE WATER SHORTAGE CONTINGENCY PLAN**

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, a water shortage contingency plan; an

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting such Water Shortage Contingency Plans;

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers to conduct an annual water supply and demand assessment (Annual Assessment) each year and to include in their water shortage contingency plans the procedures they use to conduct the Annual Assessment;

WHEREAS, the procedures used to conduct an Annual Assessment include, but are not limited to, the written decision-making process that an urban water supplier will use each year to determine its water supply reliability;

WHEREAS, The Metropolitan Water District of Southern California's (Metropolitan's) water shortage contingency plan provides that by June of each year, Metropolitan staff will present a completed Annual Assessment for approval by Metropolitan's Board of Directors or by the Board's authorized designee with expressly delegated authority for approval of Annual Assessment determinations;

and

WHEREAS, the Board of Directors of The Metropolitan Water District of Southern California has duly reviewed, discussed, and considered such Water Shortage Contingency Plan and has determined the Water Shortage Contingency Plan to be consistent with the Urban Water Management Planning Act and to be an accurate representation of the planned actions during shortage conditions for The Metropolitan Water District of Southern California.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of The Metropolitan Water District of Southern California that, on May XX, 20XX, this District hereby adopts this Water Shortage Contingency Plan for submittal to the State of California and expressly authorizes the General Manager of The Metropolitan Water District of Southern California to approve the Annual Assessment each year.

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of a resolution adopted by the Board of Directors of The Metropolitan Water District of Southern California, at its meeting held on May XX, 20XX.

_____
Secretary of the Board of Directors of
The Metropolitan Water District of
Southern California

Attachment 3
Resolution Adopting the 2025 Urban Water Management Plan

Resolution XXXX

RESOLUTION
OF THE BOARD OF DIRECTORS
OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
ADOPTING THE 2025 URBAN WATER MANAGEMENT PLAN

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, an urban water management plan every five years;

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting such urban water management plans; and

WHEREAS, the Board of Directors of The Metropolitan Water District of Southern California has duly reviewed, discussed, and considered Metropolitan's 2025 Urban Water Management Plan and has determined the 2025 Urban Water Management Plan to be consistent with the Urban Water Management Planning Act and to be an accurate representation of water resources planning for The Metropolitan Water District of Southern California.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of The Metropolitan Water District of Southern California that, on May 12, 2026, this District hereby adopts this 2025 Urban Water Management Plan for submittal to the State of California.

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of a resolution adopted by the Board of Directors of The Metropolitan Water District of Southern California, at its meeting held on May 12, 2026.

_____
Secretary of the Board of Directors
of The Metropolitan Water District
of Southern California

Attachment 4
Resolution Adopting the 2025 Water Shortage Contingency Plan

Resolution XXXX

RESOLUTION
OF THE BOARD OF DIRECTORS
OF THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
ADOPTING THE 2025 WATER SHORTAGE CONTINGENCY PLAN

WHEREAS, the Urban Water Management Planning Act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare and adopt, in accordance with prescribed requirements, a water shortage contingency plan;

WHEREAS, the Urban Water Management Planning Act specifies the requirements and procedures for adopting such water shortage contingency plans; and

WHEREAS, the Board of Directors of The Metropolitan Water District of Southern California has duly reviewed, discussed, and considered Metropolitan's updated Water Shortage Contingency Plan and has determined the Water Shortage Contingency Plan to be consistent with the Urban Water Management Planning Act and to be an accurate representation of the planned actions during shortage conditions for The Metropolitan Water District of Southern California.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of The Metropolitan Water District of Southern California that, on May 12, 2026, this District hereby adopts this update of its Water Shortage Contingency Plan for submittal to the State of California.

I HEREBY CERTIFY that the foregoing is a full, true and correct copy of a resolution adopted by the Board of Directors of The Metropolitan Water District of Southern California, at its meeting held on May 12, 2026.

_____
Secretary of the Board of Directors
of The Metropolitan Water District
of Southern California