



THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

Committee Item INFORMATION

One Water and Adaptation Committee

7/13/2026 Committee Meeting

6a

Subject

CAMP4W Quarterly Update

Executive Summary

The Climate Adaptation Master Plan for Water (CAMP4W) team made progress this quarter on preparing for an upcoming CAMP4W Member Agency Workshop and the CAMP4W Decision Support Board Workshop and on refining Working Memorandum 11 (attached) and the 2025 CAMP4W Annual Report (forthcoming).

Fiscal Impact

None.

Applicable Policy

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

By Minute Item 52776, dated April 12, 2022, the Board adopted the 2020 Integrated Water Resources Plan Needs Assessment.

By Minute Item 52946, dated August 15, 2022, the Board adopted a resolution affirming Metropolitan's call to action and commitment to regional reliability for all member agencies.

By Minute Item 53381, dated September 12, 2023, the Board approved the use of Representative Concentration Pathway (RCP) 8.5 for planning purposes in the Climate Adaptation Master Plan for Water.

By Minute Item 53630, dated May 14, 2024, the Board concurred with the CAMP4W: Draft Year One Progress Report and Next Steps, with the understanding that staff would provide the Board updated data and other information before consideration and approval of any CAMP4W projects.

By Minute Item 53436, dated April 8, 2025, the Board approved the Climate Adaptation Master Plan for Water Five-year Implementation Strategy.

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

Full Board Workshop on Decision Support is scheduled this fall to inform investment decisions using the CAMP4W decision-making framework.

Details and Background

Upcoming Board Decision Support Workshop

In preparation for the upcoming Board Workshop, staff is holding a series of internal workshops to build consensus and develop a robust and repeatable decision support process. This includes compiling decision support materials and project assessments and meeting with member agencies. The Board Workshop will include a review of water supply reliability signposts and water supply needs, project assessments, details on Pure Water Southern

California and its relationship to other potential investments, funding strategies, and a discussion on potential pathways forward.

Following the upcoming decision on Pure Water Southern California planning and design, staff will provide similar decision support for Sites Reservoir, Drought Mitigation Projects, and other potential investments.

Working Memorandum 11 and Initial Low-Regret Recommendations

Based on Member Agency comments and discussion at the May CAMP4W Subcommittee, staff adjusted Working Memorandum 11 (CAMP4W Assessments, Lessons Learned, and Low-Regret Recommendations), which is attached in both redline and clean formats. (Attachments 1 and 2). Below is the section describing initial low-regret recommendations.

Using the initial CAMP4W Assessments and ongoing planning and development work, staff developed a set of low-regret guiding recommendations that were presented to the CAMP4W Subcommittee in May. Staff's recommendations are not intended to pre-determine future portfolio or project decisions. Rather, the following recommendations are intended to guide and support an adaptive approach to project and portfolio development that helps ensure Metropolitan and its member agencies are prepared as real-world conditions evolve.

Low-regret options are near-term, relatively low-cost actions that can provide significant benefits under multiple future climate scenarios, and in some cases, can also allow for partial investment now, which would inform or prepare for subsequent, and likely more consequential decisions.

Key foundational low-regret recommendations include the following:

- *Operational resilience through increasing capital improvement program investments and supporting robust asset management:* Although traditional refurbishment and replacement projects are not evaluated using the CAMP4W framework, portfolio assessments make clear that future water supply challenges will increase if Metropolitan's baseline of service and reliability deteriorates. Maintaining existing infrastructure and facilities is foundational to maintaining long-term resilience.
- *Improving system flexibility to effectively distribute available supplies:* Developing drought mitigation solutions to achieve equitable supply reliability targets throughout Metropolitan's system remains a near-term priority to address challenges experienced in past severe droughts.

Low-regret activity and action recommendations:

- *Planning and development of new supply and storage projects:* Planning and design of projects less vulnerable to a changing climate helps prepare Metropolitan for future decision-making. Initiating or continuing the planning and design of these project types now is critical to ensure these options exist as conditions change. Development of relatively low-cost projects and programs that provide benefits across a range of future scenarios will also be continued.
- *Imported supply resilience:* Climate stressors and regulatory uncertainty impact the reliability of the State Water Project and the Colorado River Aqueduct. Investments in watershed protection, nature-based solutions and flexible imported supply strategies (e.g., rotational fallowing programs) may help retain water supply, build resilience and deliver meaningful co-benefits.
- *Enhanced flexible supply opportunities:* Tools (e.g. Local Supply Exchange Program), partnerships (e.g. water transfers) and strategic water efficiency programs that can quickly activate water savings and/or additional supplies are critical for flexibility and adaptation to extreme events and can also provide meaningful co-benefits to partners and member agencies.

At this initial stage of CAMP4W implementation, low-regret activities are more focused on evaluation and planning/design rather than on portfolio and/or project implementation. This aligns with Metropolitan's adaptive management strategy, which emphasizes incremental decisions that allow for course correction over time.

To balance the risks of over- and under-investment during times of uncertainty, it remains imperative to continue advancing low-regret activities and initial actions, including relatively low-cost projects that can address near-term reliability gaps and help meet CAMP4W time-bound targets.

CAMP4W Annual Report and RCP 8.5

Staff presented an update on Annual Report data including water supply signposts, time-bound targets and implementation highlights at the May CAMP4W Subcommittee. The Annual Report is an important component of CAMP4W's adaptive management approach. For example, signposts help track how conditions evolve over time to inform adaptive planning and decision-making.

One area of considerable discussion at the CAMP4W Subcommittee was Metropolitan's use of Representative Concentration Pathway (RCP) 8.5 in the signpost for climate change. In September 2023, the Board approved the use of RCP 8.5 for planning purposes in the Climate Adaptation Master Plan for Water. At the time, the use of RCP 8.5 was consistent with water and energy utility best practices and was the recommended approach of the California Governor's Office of Planning and Research. Incorporating this direction was also consistent with the underlying assumptions of Scenarios C and D in Metropolitan's 2020 Integrated Resources Plan (IRP) Needs Assessment, which were developed in consultation with an expert panel and based on the Intergovernmental Panel on Climate Change Assessment Reports (and corresponding global climate models) using the most recent projections available at the time.

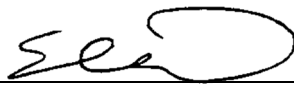
The Board's decision to use RCP 8.5 for planning purposes was also predicated on Metropolitan applying an adaptive management and iterative approach in CAMP4W to systematically reevaluate underlying assumptions and needs. Recent advances in climate science and emissions projections indicate that alternative scenario frameworks may provide a more representative basis for evaluating future climate risks. Thus, as part of Metropolitan's ongoing commitment to using the best available science to inform long-term planning, staff is reevaluating the use of the RCP 8.5 emissions scenario within the IRP Needs Assessment and CAMP4W.

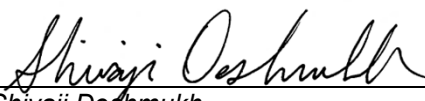
Next Steps

- Finalize the 2025 CAMP4W Annual Report.
- Continue internal alignment and collaboration to ensure CAMP4W decision support materials reflect the breadth of staff expertise.
- Work with member agencies on the development of information to support Board decision-making.
- Prepare for Fall Board CAMP4W Workshop.

Timing and Urgency

Quarterly update.


Elizabeth K. Crosson
Chief Sustainability, Resilience, and
Innovation Office
6/29/2026
Date


Shivaji Deshmukh
General Manager
6/29/2026
Date

Attachment 1 – Working Memorandum 11 (redline)

Attachment 2 – Working Memorandum 11 (final)

Climate Adaptation Master Plan for Water (CAMP4W)

WORKING MEMORANDUM 11

CAMP4W ASSESSMENTS, LESSONS LEARNED, AND LOW REGRET RECOMMENDATIONS

~~June~~May 2026

1 Introduction

Extreme weather has become an ongoing reality in California and across the Western United States, offering a continued and evolving preview of the challenges ahead as climate change drives increasing “weather whiplash”. This is putting mounting pressure on water and power management within the region. In response, the Board directed staff to integrate water resources, climate, and financial planning into a Climate Adaptation Master Plan for Water (CAMP4W), and in October 2023, chartered a Joint Task Force of Board Members and Member Agency Managers to facilitate the development of CAMP4W in a timely and transparent process. CAMP4W comprises multiple components which together form a living master planning program. Those components include: (1) IRP-informed Needs and Climate and Growth Scenarios, (2) Time-Bound Targets, (3) A Framework for Climate Decision-Making and Reporting, (4) Policies, Initiatives, and Partnerships, and (5) Business Models and Funding Strategies. CAMP4W increases Metropolitan’s understanding of the risks to water supplies, water and energy infrastructure reliability, operations, and workforce, and ensures Metropolitan is mitigating those risks to ultimately strengthen its ability to fulfill its mission.

In April 2025, the CAMP4W Implementation Strategy was unanimously approved by the Board. The Implementation Strategy built out several of the core components of CAMP4W, including the evaluative criteria and assessment methodology for projects and programs, policy directives and timelines for implementing key initiatives, as well as tracking and reporting frameworks for scenario planning tools and time-bound targets. The plan was developed through extensive engagement with water leaders, business interests, environmental groups, community-based organizations and the public across the region, and engagement continues through implementation.

A key outcome of the CAMP4W Implementation Strategy involved the development of a project and program assessment methodology that requires consideration of the following evaluative criteria: **reliability, resilience, financial sustainability and affordability, adaptability and flexibility, equity, and the environment. These assessments are intended to help the Board decide which projects and programs to support, at what scale, and when.** The assessments will facilitate Board decisions at each stage of a project or program, from funding early planning phases, through design phases, and ultimately determining whether to construct projects. Data presented in the assessments will become more accurate as the project moves through each phase and details such as costs, benefits, and constraints are refined.

In the year since the CAMP4W Implementation Strategy was adopted, staff have continued to develop assessments for several proposed projects, including Pure Water Southern California, Sites Reservoir, Delta Conveyance Project and new potential storage investments. Many, but not yet all, of these assessments have been presented in stages to Metropolitan's member agencies, Board and the public since late 2025 and are continuing throughout 2026.

This Working Memorandum 11 provides an overview of the progress to date, lessons learned, and upcoming steps in developing low regret options to move forward under the adaptive management process described in the CAMP4W Implementation Strategy.

2 Understanding Risk and the Adaptive Management Process

Preparing for a future impacted by a changing climate requires planning for an uncertain future. Historical planning processes founded on looking to the past to predict the future are not enough. Metropolitan's advancement into this new reality began with the 2020 Integrated Resources Plan (IRP) Needs Assessment, which presented four scenarios (A, B, C, and D) and identified a range of potential core supply, flexible supply, and storage that Metropolitan may need to invest in to remain reliable.

The intent of this work is to provide the Board with the information needed to thoughtfully weigh the risks of either **over-development** (constructing projects or at a scale that are unnecessary and result in stranded assets and the associated undue financial burden) or **under-development** (not developing enough projects, resulting in regional water shortages). Both ends of the spectrum (

Figure 2 ~~Figure 1~~) present **significant risks**. To mitigate these risks, Metropolitan developed and presented in the CAMP4W Implementation Strategy an adaptive management approach that seeks to balance the two ends of the spectrum. In alignment with this concept, the Board directed staff to focus on *planning* towards the more severe hydrologic futures associated with RCP 8.5 (IRP Scenarios C and D). Other scenarios and potential climate futures will also be considered ~~as necessary to understand~~ potential project and program performance across a range of potential future conditions. Board investment decisions regarding *implementation* (i.e. construction of projects) will weigh the spectrum of risk by basing actual decisions on real-world trends, funding and partnership opportunities, and an evaluation of potential tradeoffs at the time when those decisions are made.



Figure 1. Relationships Between Risk Elements

Adaptive management in the context of CAMP4W project development means making incremental decisions, while allowing for course corrections if conditions change from what was initially expected.

Low regret options are near-term, relatively low-cost actions that can provide significant benefits under multiple future climate scenarios, and in some cases, can also allow for partial investment now, which

would inform or prepare for subsequent, and likely more consequential decisions. It is critical to understand that implementation lead times for significant projects range from years to decades, so decisions in the short term have a significant impact on the options available in the future.

Low regret options often have at least some of the following characteristics, summarized [Figure 2](#):

- Provide opportunities for future decisions by investing in near-term, lower-cost planning or development phases to gain additional information that will inform future actions
- Provide benefits across a range of future scenarios
- Can be scaled, phased, or adjusted over time based on feedback from changing conditions
- Improve system performance without committing to a single future
- Strengthen existing investments and maintain decision-making flexibility
- Pair well with other potential investments and result in compound benefits

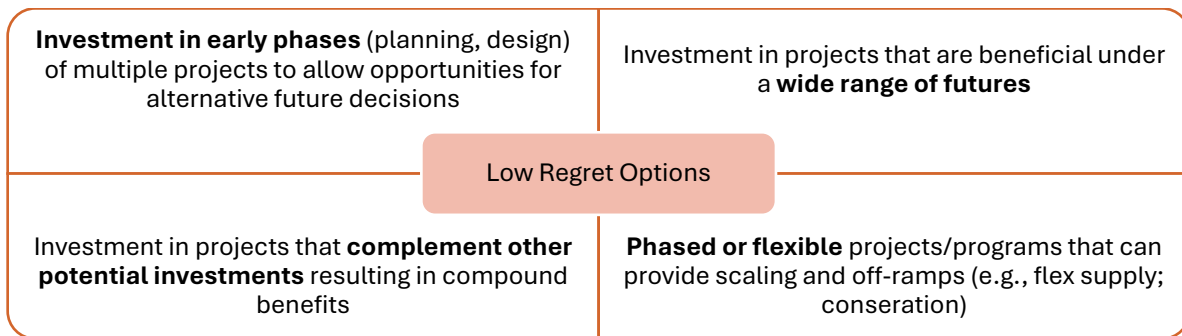


Figure 2. Key Elements of Low Regret Options

Progress since the approval of the CAMP4W Implementation Strategy has revealed a series of low regret options available to Metropolitan. Those are discussed below in Section 4, following a summary of CAMP4W Assessments under review.

Having Options Reduce Risk

Making the decision to move into the construction phase of a project (i.e. project implementation phase) will incur costs that far exceed planning and design costs. The financial risk, and impact on rates, to plan and design projects is relatively minimal compared to construction. In addition, advancing multiple projects and programs through the planning and design phases provides opportunities to assess multiple projects simultaneously at early stages of a project's life cycle. This approach is especially useful for large projects that can take years to decades to implement. Planning and design phases also refine what we know about each project and program, supporting more informed decisions about which will ultimately be the best for the region.

Advancing planning and design phases for all viable projects and programs expands the number of viable alternatives Metropolitan will have to consider when (or if) implementation is needed. If Metropolitan were to decide today on a narrow list of investments to conduct planning and design, this would amount to prematurely deciding which projects can be constructed 10-20+ years from now, eliminating options in the future. Being flexible and funding the planning and design of more projects than may be deemed necessary now is a low regret, adaptive approach that allows Metropolitan to remain flexible.

Flexibility is key in an uncertain future. With more options available, in the coming years and decades, Metropolitan will have the flexibility to pause or halt projects if they become infeasible, are found to conflict with preferred or already implemented projects or are found to be unnecessary due to evolving conditions.

3 CAMP4W Assessments Under Review

3.1 Progress to Date: Individual and Portfolio Assessments Performed

As an initial step in implementing the CAMP4W Implementation Strategy, staff focused on the use and refinement of the CAMP4W Decision-Making Framework and Assessment Form. Staff conducted individual project and program assessments using the CAMP4W Decision-Making Framework as a first comprehensive test of the evaluation process. These assessments involved collaboration across multiple departments to evaluate projects through the lenses of the criteria – water supply reliability, climate resilience, system flexibility and adaptability, equity, environmental co-benefits, financial considerations, and implementation feasibility. This cross-functional assessment effort provided valuable insight into both the strengths of individual projects and programs and the practical application of the framework.

In parallel, Metropolitan incorporated standard updates to the 2020 IRP Needs Assessment's baseline conditions to ensure the reliability analyses reflect current 2025 information and system conditions. These updates included revised demand projections, local supply and imported supply outlooks, current storage levels, system flexibility measures taken since the 2020-2022 drought, and updated demand management measures. The foundational assumptions of the 2020 IRP Needs Assessment were not changed. Scenarios C and D still reflect the higher climate change impacts associated with RCP 8.5 which is consistent with prior Board direction to evaluate more severe hydrologic futures in the CAMP process.

This initial assessment process primarily involved evaluating the select individual projects listed below. It also incorporated a preliminary set of assessments for project portfolios to test how the methodology may be used to evaluate projects working in combination. These initial assessments are informing process refinement and will be reflected in assessments presented to Member Agencies and Board in the coming months. Several lessons learned in this process are presented in the next section.

The CAMP4W Project and Portfolio Assessments included the following:

Individual Project Assessments

- Pure Water Southern California
 - at 45 MGD stage
 - at 75 MGD stage
 - Full 150 MGD project
- Sites Reservoir
- Delta Conveyance Project
- Partial assessments: significant information for the additional projects presented in Sequences 1 and 2 Portfolios was compiled to inform the portfolio analysis. Future project assessments may involve complete individual assessments for those projects.

Portfolio Assessments

- Major Projects Portfolio (modeled for reliability benefits and potential rate impacts)
 - Pure Water Southern California (150 MGD project)
 - Sites Reservoir
 - Delta Conveyance Project
 - AVEK Expansion
 - South of Delta Storage
- Sequence 1 Portfolio
 - Sepulveda Pump Stage 2
 - Pure Water Southern California (45 MGD)
 - Regional Conveyance
- Sequence 2 Portfolio
 - In Delta Investments (not modeled for reliability)
 - AVEK Expansion
 - South of Delta Storage Reservoir
 - Sites Reservoir
 - Delta Conveyance Project

Staff first analyzed the Major Projects Portfolio as an initial step to address the shortages identified in Scenarios C and D. This analysis focused only on the water supply reliability criterion. While the Major Projects Portfolio eliminated the shortages seen in Scenario C, significant shortages persisted in Scenario D. This finding underscores the need for an adaptive management approach to address reliability under conditions of severe climate change and high growth and suggests that achieving full reliability may not be feasible under all future conditions. As such, this finding provides a basis for continued discussion with the Board on acceptable levels of risk and reliability. By monitoring the signposts on a regular basis, trends that may impact the region's supply, demand, and storage, can be identified early and response

actions can be planned. Metropolitan continues to track changing conditions and plans towards a range of futures to identify the actions that may be needed over time, while helping to reduce the risk of over-investment in the near term.

Using the 2025 Updates to the 2020 IRP's refined Scenario C and D baselines, Metropolitan evaluated Sequence 1 and Sequence 2 portfolios under both expected project start dates and a "fully built" condition to assess near-term risks and long-term reliability value. The modeling demonstrated that, while the sequences reduce the severity and frequency of shortages by shifting impacts into more manageable ranges, shortages persist, underscoring the continued need for additional core supplies, storage investments, and demand management actions. At the same time, the analysis identifies increasing volumes of unmanaged surplus water, even where shortages are not fully eliminated. This suggests that the benefits of certain projects may not be fully realized within the existing system and could require additional investments, such as new or expanded storage, operational changes, or adjustments to project scale, to better align supply with system needs. Together, this work advances both the individual and portfolio-level analyses under CAMP4W and provides a clearer understanding of trade-offs, risk exposure, and policy considerations for the Board's ongoing deliberations.

3.2 Assessment Lessons Learned

Metropolitan staff evaluated the process for developing the assessment forms both at a project level and portfolio level. The following presents the most significant lessons learned and takeaways that will be carried forward for future assessments and refinements to the methodology.

CAMP4W Individual Project Assessments: Lessons Learned

- The Decision-Making Framework and evaluative criteria work well for individual projects and programs. Assessments highlight the strengths and areas for improvement for each potential investment. The comprehensiveness of the form helps communicate a project or program's values across the six criteria categories.
- Assessments can vary for projects and programs at different levels of maturity, which can make comparisons challenging. The type (qualitative vs. quantitative) and level of detail presented will depend on the stage of development, for example, early-stage projects may rely more on qualitative information, while more advanced projects can be evaluated with greater specificity.
- To support more meaningful and consistent evaluations, projects should reach a sufficient level of definition before being assessed within CAMP4W. Rather than reassessing at each project phase, updates may be more appropriate when significant changes in project assumptions or new information could materially affect outcomes.
- Assessment forms and scoring approach could be simplified to improve readability and standardization. The team is working on refinements to improve the digestibility of information without compromising the quality of the assessment or oversimplifying the opportunities or challenges.
- Delineating the roles of the project lead and the assessment team in conducting the assessment is important. To ensure an objective, standardized approach, it is important to have the assessment team of subject matter experts conduct each assessment based on information provided by project proponents.

CAMP4W Portfolio Assessments: Lessons Learned

- A combined set of projects and/or programs can be assessed using the methodology. However, the type of results and appropriate level of detail and confidence in the results will depend on factors such as:
 - The stage and/or maturity level of the project or program (e.g., in planning, design, etc.)
 - The criterion against which the set of projects and/or programs are being evaluated (reliability, resilience, financial sustainability, etc.)
 - Consistency between the each project's and/or program's phases (conceptual planning vs. complete design package) included in that portfolio and how the differences are reconciled
- Given inconsistencies in project and program development stages, completed portfolio assessments were most beneficial in this first round when used to assess high-level reliability benefits and cost impact over time, demonstrating the combined project/program effectiveness in reducing shortages across various future scenarios. Future analyses of project pairings will benefit from exploring combinations ~~integration~~ of projects that strategically align to support a more deliberate approach, strengthening ~~to strengthen the~~ analysis and improving ~~ing~~ decision-making support.

4 Next Steps: Low Regret Recommendations and Assessment Methodology Refinement

4.1 Initial Low Regret Recommendations

Metropolitan's long-term planning under CAMP4W accounts for current uncertainties, including the unresolved future of Colorado River allocations post-2026, evolving state regulatory requirements, hydrology-driven climate variability, unpredictable climate-related and seismic events, and fiscal constraints that must be balanced with rate affordability. This makes it difficult to commit to a single set of preferred investments while maintaining strategic flexibility across multiple supply and demand scenarios. For this reason, taking a low regret approach is prudent.

Over the first year following the adoption of the CAMP4W Implementation Strategy, staff developed a set of low regret guiding recommendations. Staff's recommendations are not intended to pre-determine future portfolio or project decisions. Rather, the following recommendations are intended to guide and support an adaptive ~~planning of approach to projects and portfolios~~ and development ~~process~~ that helps ensure Metropolitan and its member agencies are prepared as real world conditions evolve.

~~The initial key~~ Key foundational low-regret recommendations include the following:

- *Operational resilience through increasing capital improvement program investments and supporting robust asset management:* Although traditional R&R projects are not evaluated using the CAMP4W framework, portfolio assessments make clear that future water supply challenges will increase if Metropolitan's baseline of service and reliability deteriorates. Maintaining existing infrastructure and facilities is foundational to maintaining long-term resilience.

- Improving system flexibility to effectively distribute available supplies: Developing drought mitigation solutions to achieve equitable supply reliability targets throughout Metropolitan's system remains a near-term priority to address challenges experienced in past severe droughts.

• Low regret activity and action recommendations:

- *Planning and development of new supply and storage projects:* Planning and design of projects less vulnerable to a changing climate helps prepare Metropolitan for future decision making. Initiating or continuing the planning and design of these project types now is critical to ensure these options exist as conditions change. Development of relatively low-cost projects and programs that provide benefits across a range of future scenarios will also be continued.
- *Imported supply resilience:* Climate stressors and regulatory uncertainty impact the reliability of the State Water Project and the Colorado River Aqueduct. Investments in watershed protection, and nature-based solutions, and flexible imported supply strategies (e.g., rotational fallowing programs) may help retain water supply, build resilience and deliver meaningful co-benefits.
- *Enhanced flexible supply opportunities:* Tools (e.g. Local Supply Exchange Program), partnerships (e.g. water transfers) and strategic water efficiency programs that can quickly activate water savings and/or additional supplies are critical for flexibility and adaptation to extreme events and can also provide meaningful co-benefits to partners and member agencies.

At this initial stage of CAMP4W implementation, low-regret ~~actions-activities~~ are more focused on evaluation and (planning/design rather) than on portfolio and/or project implementation. This aligns, aligning with Metropolitan's adaptive management strategy, which emphasizes incremental decisions that allow for course correction over time.

To balance the risks of over- and under-investment during times of uncertainty, it remains imperative to continue advancing low regret activities and initial actions, including relatively low-cost projects that can address near-term reliability gaps and help meet CAMP4W time-bound targets.

4.2 Assessment Methodology Refinement

Based on lessons learned in the assessment process presented above, Metropolitan will be making refinements to the overall process for assessing projects and programs, with a focus on developing a methodology for integrating analyses to consider potential synergies and/or tradeoffs, including how certain projects may be more effective when paired or sequenced together, between investments to enable more deliberate and informed decision-making.

This methodology will be presented to Member Agencies and the Board in the coming months and will be followed by refined assessments and documentation intended to support near-term decision-making.

Climate Adaptation Master Plan for Water (CAMP4W)

WORKING MEMORANDUM 11

CAMP4W ASSESSMENTS, LESSONS LEARNED, AND LOW REGRET RECOMMENDATIONS

June 2026

1 Introduction

Extreme weather has become an ongoing reality in California and across the Western United States, offering a continued and evolving preview of the challenges ahead as climate change drives increasing “weather whiplash”. This is putting mounting pressure on water and power management within the region. In response, the Board directed staff to integrate water resources, climate, and financial planning into a Climate Adaptation Master Plan for Water (CAMP4W), and in October 2023, chartered a Joint Task Force of Board Members and Member Agency Managers to facilitate the development of CAMP4W in a timely and transparent process. CAMP4W comprises multiple components which together form a living master planning program. Those components include: (1) IRP-informed Needs and Climate and Growth Scenarios, (2) Time-Bound Targets, (3) A Framework for Climate Decision-Making and Reporting, (4) Policies, Initiatives, and Partnerships, and (5) Business Models and Funding Strategies. CAMP4W increases Metropolitan’s understanding of the risks to water supplies, water and energy infrastructure reliability, operations, and workforce, and ensures Metropolitan is mitigating those risks to ultimately strengthen its ability to fulfill its mission.

In April 2025, the CAMP4W Implementation Strategy was unanimously approved by the Board. The Implementation Strategy built out several of the core components of CAMP4W, including the evaluative criteria and assessment methodology for projects and programs, policy directives and timelines for implementing key initiatives, as well as tracking and reporting frameworks for scenario planning tools and time-bound targets. The plan was developed through extensive engagement with water leaders, business interests, environmental groups, community-based organizations and the public across the region, and engagement continues through implementation.

A key outcome of the CAMP4W Implementation Strategy involved the development of a project and program assessment methodology that requires consideration of the following evaluative criteria: **reliability, resilience, financial sustainability and affordability, adaptability and flexibility, equity, and the environment. These assessments are intended to help the Board decide which projects and programs to support, at what scale, and when.** The assessments will facilitate Board decisions at each stage of a project or program, from funding early planning phases, through design phases, and ultimately determining whether to construct projects. Data presented in the assessments will become more accurate as the project moves through each phase and details such as costs, benefits, and constraints are refined.

In the year since the CAMP4W Implementation Strategy was adopted, staff have continued to develop assessments for several proposed projects, including Pure Water Southern California, Sites Reservoir, Delta Conveyance Project and new potential storage investments. Many, but not yet all, of these assessments have been presented in stages to Metropolitan's member agencies, Board and the public since late 2025 and are continuing throughout 2026.

This Working Memorandum 11 provides an overview of the progress to date, lessons learned, and upcoming steps in developing low regret options to move forward under the adaptive management process described in the CAMP4W Implementation Strategy.

2 Understanding Risk and the Adaptive Management Process

Preparing for a future impacted by a changing climate requires planning for an uncertain future. Historical planning processes founded on looking to the past to predict the future are not enough. Metropolitan's advancement into this new reality began with the 2020 Integrated Resources Plan (IRP) Needs Assessment, which presented four scenarios (A, B, C, and D) and identified a range of potential core supply, flexible supply, and storage that Metropolitan may need to invest in to remain reliable.

The intent of this work is to provide the Board with the information needed to thoughtfully weigh the risks of either **over-development** (constructing projects or at a scale that are unnecessary and result in stranded assets and the associated undue financial burden) or **under-development** (not developing enough projects, resulting in regional water shortages). Both ends of the spectrum (Figure 1) present **significant risks**. To mitigate these risks, Metropolitan developed and presented in the CAMP4W Implementation Strategy an adaptive management approach that seeks to balance the two ends of the spectrum. In alignment with this concept, the Board directed staff to focus on *planning* towards the more severe hydrologic futures associated with RCP 8.5 (IRP Scenarios C and D). Other scenarios and potential climate futures will also be considered to understand potential project and program performance across a range of potential future conditions. Board investment decisions regarding *implementation* (i.e. construction of projects) will weigh the spectrum of risk by basing actual decisions on real-world trends, funding and partnership opportunities, and an evaluation of potential tradeoffs at the time when those decisions are made.



Figure 1. Relationships Between Risk Elements

Adaptive management in the context of CAMP4W project development means making incremental decisions, while allowing for course corrections if conditions change from what was initially expected.

Low regret options are near-term, relatively low-cost actions that can provide significant benefits under multiple future climate scenarios, and in some cases, can also allow for partial investment now, which

would inform or prepare for subsequent, and likely more consequential decisions. It is critical to understand that implementation lead times for significant projects range from years to decades, so decisions in the short term have a significant impact on the options available in the future.

Low regret options often have at least some of the following characteristics, summarized Figure 2:

- Provide opportunities for future decisions by investing in near-term, lower-cost planning or development phases to gain additional information that will inform future actions
- Provide benefits across a range of future scenarios
- Can be scaled, phased, or adjusted over time based on feedback from changing conditions
- Improve system performance without committing to a single future
- Strengthen existing investments and maintain decision-making flexibility
- Pair well with other potential investments and result in compound benefits

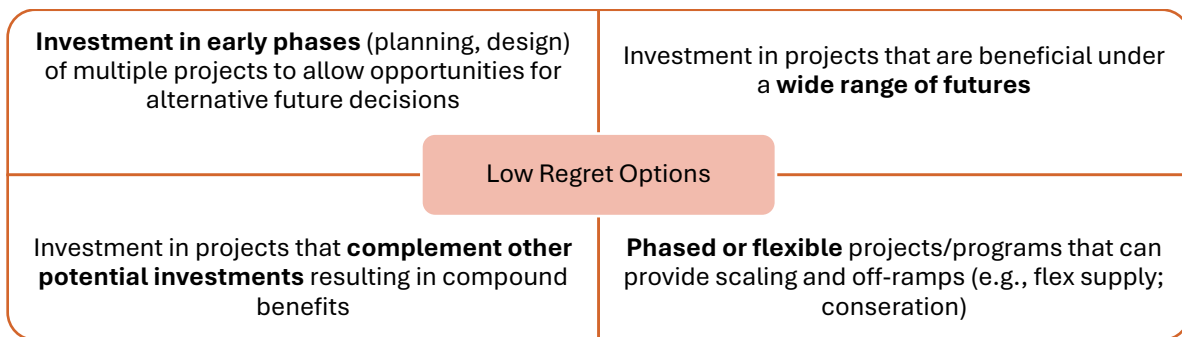


Figure 2. Key Elements of Low Regret Options

Progress since the approval of the CAMP4W Implementation Strategy has revealed a series of low regret options available to Metropolitan. Those are discussed below in Section 4, following a summary of CAMP4W Assessments under review.

Having Options Reduce Risk

Making the decision to move into the construction phase of a project (i.e. project implementation phase) will incur costs that far exceed planning and design costs. The financial risk, and impact on rates, to plan and design projects is relatively minimal compared to construction. In addition, advancing multiple projects and programs through the planning and design phases provides opportunities to assess multiple projects simultaneously at early stages of a project's life cycle. This approach is especially useful for large projects that can take years to decades to implement. Planning and design phases also refine what we know about each project and program, supporting more informed decisions about which will ultimately be the best for the region.

Advancing planning and design phases for all viable projects and programs expands the number of viable alternatives Metropolitan will have to consider when (or if) implementation is needed. If Metropolitan were to decide today on a narrow list of investments to conduct planning and design, this would amount to prematurely deciding which projects can be constructed 10-20+ years from now, eliminating options in the future. Being flexible and funding the planning and design of more projects than may be deemed necessary now is a low regret, adaptive approach that allows Metropolitan to remain flexible.

Flexibility is key in an uncertain future. With more options available, in the coming years and decades, Metropolitan will have the flexibility to pause or halt projects if they become infeasible, are found to conflict with preferred or already implemented projects or are found to be unnecessary due to evolving conditions.

3 CAMP4W Assessments Under Review

3.1 Progress to Date: Individual and Portfolio Assessments Performed

As an initial step in implementing the CAMP4W Implementation Strategy, staff focused on the use and refinement of the CAMP4W Decision-Making Framework and Assessment Form. Staff conducted individual project and program assessments using the CAMP4W Decision-Making Framework as a first comprehensive test of the evaluation process. These assessments involved collaboration across multiple departments to evaluate projects through the lenses of the criteria – water supply reliability, climate resilience, system flexibility and adaptability, equity, environmental co-benefits, financial considerations, and implementation feasibility. This cross-functional assessment effort provided valuable insight into both the strengths of individual projects and programs and the practical application of the framework.

In parallel, Metropolitan incorporated standard updates to the 2020 IRP Needs Assessment's baseline conditions to ensure the reliability analyses reflect current 2025 information and system conditions. These updates included revised demand projections, local supply and imported supply outlooks, current storage levels, system flexibility measures taken since the 2020-2022 drought, and updated demand management measures. The foundational assumptions of the 2020 IRP Needs Assessment were not changed. Scenarios C and D still reflect the higher climate change impacts associated with RCP 8.5 which is consistent with prior Board direction to evaluate more severe hydrologic futures in the CAMP process.

This initial assessment process primarily involved evaluating the select individual projects listed below. It also incorporated a preliminary set of assessments for project portfolios to test how the methodology may be used to evaluate projects working in combination. These initial assessments are informing process refinement and will be reflected in assessments presented to Member Agencies and Board in the coming months. Several lessons learned in this process are presented in the next section.

The CAMP4W Project and Portfolio Assessments included the following:

Individual Project Assessments

- Pure Water Southern California
 - at 45 MGD stage
 - at 75 MGD stage
 - Full 150 MGD project
- Sites Reservoir
- Delta Conveyance Project
- Partial assessments: significant information for the additional projects presented in Sequences 1 and 2 Portfolios was compiled to inform the portfolio analysis. Future project assessments may involve complete individual assessments for those projects.

Portfolio Assessments

- Major Projects Portfolio (modeled for reliability benefits and potential rate impacts)
 - Pure Water Southern California (150 MGD project)
 - Sites Reservoir
 - Delta Conveyance Project
 - AVEK Expansion
 - South of Delta Storage
- Sequence 1 Portfolio
 - Sepulveda Pump Stage 2
 - Pure Water Southern California (45 MGD)
 - Regional Conveyance
- Sequence 2 Portfolio
 - In Delta Investments (not modeled for reliability)
 - AVEK Expansion
 - South of Delta Storage Reservoir
 - Sites Reservoir
 - Delta Conveyance Project

Staff first analyzed the Major Projects Portfolio as an initial step to address the shortages identified in Scenarios C and D. This analysis focused only on the water supply reliability criterion. While the Major Projects Portfolio eliminated the shortages seen in Scenario C, significant shortages persisted in Scenario D. This finding underscores the need for an adaptive management approach to address reliability under conditions of severe climate change and high growth and suggests that achieving full reliability may not be feasible under all future conditions. As such, this finding provides a basis for continued discussion with the Board on acceptable levels of risk and reliability. By monitoring the signposts on a regular basis, trends that may impact the region's supply, demand, and storage, can be identified early and response

actions can be planned. Metropolitan continues to track changing conditions and plans towards a range of futures to identify the actions that may be needed over time, while helping to reduce the risk of over-investment in the near term.

Using the 2025 Updates to the 2020 IRP's refined Scenario C and D baselines, Metropolitan evaluated Sequence 1 and Sequence 2 portfolios under both expected project start dates and a "fully built" condition to assess near-term risks and long-term reliability value. The modeling demonstrated that, while the sequences reduce the severity and frequency of shortages by shifting impacts into more manageable ranges, shortages persist, underscoring the continued need for additional core supplies, storage investments, and demand management actions. At the same time, the analysis identifies increasing volumes of unmanaged surplus water, even where shortages are not fully eliminated. This suggests that the benefits of certain projects may not be fully realized within the existing system and could require additional investments, such as new or expanded storage, operational changes, or adjustments to project scale, to better align supply with system needs. Together, this work advances both the individual and portfolio-level analyses under CAMP4W and provides a clearer understanding of trade-offs, risk exposure, and policy considerations for the Board's ongoing deliberations.

3.2 Assessment Lessons Learned

Metropolitan staff evaluated the process for developing the assessment forms both at a project level and portfolio level. The following presents the most significant lessons learned and takeaways that will be carried forward for future assessments and refinements to the methodology.

CAMP4W Individual Project Assessments: Lessons Learned

- The Decision-Making Framework and evaluative criteria work well for individual projects and programs. Assessments highlight the strengths and areas for improvement for each potential investment. The comprehensiveness of the form helps communicate a project or program's values across the six criteria categories.
- Assessments can vary for projects and programs at different levels of maturity, which can make comparisons challenging. The type (qualitative vs. quantitative) and level of detail presented will depend on the stage of development, for example, early-stage projects may rely more on qualitative information, while more advanced projects can be evaluated with greater specificity.
- To support more meaningful and consistent evaluations, projects should reach a sufficient level of definition before being assessed within CAMP4W. Rather than reassessing at each project phase, updates may be more appropriate when significant changes in project assumptions or new information could materially affect outcomes.
- Assessment forms and scoring approach could be simplified to improve readability and standardization. The team is working on refinements to improve the digestibility of information without compromising the quality of the assessment or oversimplifying the opportunities or challenges.
- Delineating the roles of the project lead and the assessment team in conducting the assessment is important. To ensure an objective, standardized approach, it is important to have the assessment team of subject matter experts conduct each assessment based on information provided by project proponents.

CAMP4W Portfolio Assessments: Lessons Learned

- A combined set of projects and/or programs can be assessed using the methodology. However, the type of results and appropriate level of detail and confidence in the results will depend on factors such as:
 - The stage and/or maturity level of the project or program (e.g., in planning, design, etc.)
 - The criterion against which the set of projects and/or programs are being evaluated (reliability, resilience, financial sustainability, etc.)
 - Consistency between the each project's and/or program's phases (conceptual planning vs. complete design package) included in that portfolio and how the differences are reconciled
- Given inconsistencies in project and program development stages, completed portfolio assessments were most beneficial in this first round when used to assess high-level reliability benefits and cost impact over time, demonstrating the combined project/program effectiveness in reducing shortages across various future scenarios. Future analyses of project pairings will benefit from exploring combinations of projects that strategically align to support a more deliberate approach, strengthening analysis and improving decision-making support.

4 Next Steps: Low Regret Recommendations and Assessment Methodology Refinement

4.1 Initial Low Regret Recommendations

Metropolitan's long-term planning under CAMP4W accounts for current uncertainties, including the unresolved future of Colorado River allocations post-2026, evolving state regulatory requirements, hydrology-driven climate variability, unpredictable climate-related and seismic events, and fiscal constraints that must be balanced with rate affordability. This makes it difficult to commit to a single set of preferred investments while maintaining strategic flexibility across multiple supply and demand scenarios. For this reason, taking a low regret approach is prudent.

Over the first year following the adoption of the CAMP4W Implementation Strategy, staff developed a set of low regret guiding recommendations. Staff's recommendations are not intended to pre-determine future portfolio or project decisions. Rather, the following recommendations are intended to guide and support an adaptive approach to project and portfolio development that helps ensure Metropolitan and its member agencies are prepared as real world conditions evolve.

Key foundational low-regret recommendations include the following:

- *Operational resilience through increasing capital improvement program investments and supporting robust asset management:* Although traditional R&R projects are not evaluated using the CAMP4W framework, portfolio assessments make clear that future water supply challenges will increase if Metropolitan's baseline of service and reliability deteriorates. Maintaining existing infrastructure and facilities is foundational to maintaining long-term resilience.

- *Improving system flexibility to effectively distribute available supplies:* Developing drought mitigation solutions to achieve equitable supply reliability targets throughout Metropolitan's system remains a near-term priority to address challenges experienced in past severe droughts.

Low regret activity and action recommendations:

- *Planning and development of new supply and storage projects:* Planning and design of projects less vulnerable to a changing climate helps prepare Metropolitan for future decision making. Initiating or continuing the planning and design of these project types now is critical to ensure these options exist as conditions change. Development of relatively low-cost projects and programs that provide benefits across a range of future scenarios will also be continued.
- *Imported supply resilience:* Climate stressors and regulatory uncertainty impact the reliability of the State Water Project and the Colorado River Aqueduct. Investments in watershed protection, nature-based solutions, and flexible imported supply strategies (e.g., rotational fallowing programs) may help retain water supply, build resilience and deliver meaningful co-benefits.
- *Enhanced flexible supply opportunities:* Tools (e.g. Local Supply Exchange Program), partnerships (e.g. water transfers) and strategic water efficiency programs that can quickly activate water savings and/or additional supplies are critical for flexibility and adaptation to extreme events and can also provide meaningful co-benefits to partners and member agencies.

At this initial stage of CAMP4W implementation, low-regret activities are more focused on evaluation and planning/design rather than on portfolio and/or project implementation. This aligns with Metropolitan's adaptive management strategy, which emphasizes incremental decisions that allow for course correction over time.

To balance the risks of over- and under-investment during times of uncertainty, it remains imperative to continue advancing low regret activities and initial actions, including relatively low-cost projects that can address near-term reliability gaps and help meet CAMP4W time-bound targets.

4.2 Assessment Methodology Refinement

Based on lessons learned in the assessment process presented above, Metropolitan will be making refinements to the overall process for assessing projects and programs, with a focus on developing a methodology for integrating analyses to consider potential synergies and/or tradeoffs, including how certain projects may be more effective when paired or sequenced together, to enable more deliberate and informed decision-making.

This methodology will be presented to Member Agencies and the Board in the coming months and will be followed by refined assessments and documentation intended to support near-term decision-making.