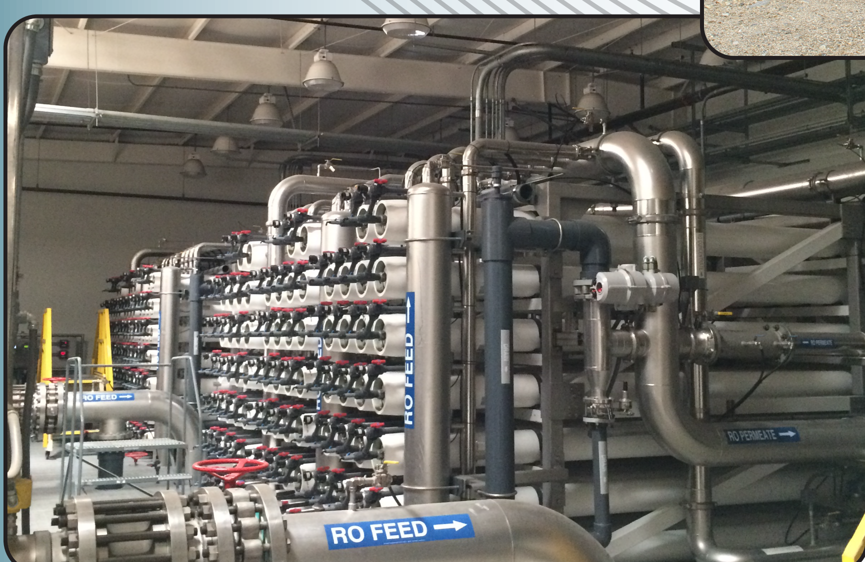
2020

Optimum Basin Management Program Update Report

Prepared for:

Chino Basin Watermaster
Partners in Basin Management



January 2020

WEI
Wildermuth Environmental, Inc.

To: Chino Basin Watermaster Stakeholders

From: Watermaster 2020 OBMP Update Team

Subject: 2020 Optimum Basin Management Program Update Report

Date: Draft November 22, 2019; Final January 24, 2020

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1.0 Introduction and Background

In September 2018, the Chino Basin Watermaster (Watermaster) initiated the process to update its Optimum Basin Management Program (OBMP) and the associated Implementation Plan. A detailed description of the development of the 2000 OBMP and the rationale for and process to prepare the 2020 OBMP Update was described in a white paper prepared for the stakeholders: *White Paper – 2020 Update to Chino Basin Optimum Basin Management Program* (OBMP White Paper). The OBMP White Paper is included herein as Appendix A.

The purpose of this *2020 Optimum Basin Management Program Update Report* (2020 OBMP Update Report) is to document the stakeholder process to update the OBMP and describe the recommended 2020 OBMP management plan. The management plan will form the foundation for Watermaster and the Chino Basin Judgment Parties (hereafter, Parties[1]) to develop a final implementation plan (the 2020 OBMP Implementation Plan) and the agreements necessary to implement it. The draft 2020 OBMP Update Report was released for stakeholder review and comment on November 22, 2019. This version reflects changes made in response to comments received. A record of the comments received and the responses provided by Watermaster are included herein as Appendix B.

1.1 History of the OBMP and its Implementation

The Chino Basin Judgment invested Watermaster with the discretionary authority to develop an OBMP for the Chino Basin, including both water quantity and quality considerations. Paragraph 41 (within the Physical Solution), states:

> 41. Watermaster Control. Watermaster, with the advice of the Advisory and Pool Committees, is granted discretionary powers in order to develop an optimum basin management program for Chino Basin, including both water quantity and quality considerations. Withdrawals and supplemental water replenishment of Basin Water, and the full utilization of the water resources of Chino Basin, must be subject to procedures established by and administered through Watermaster with the advice and assistance of the Advisory and Pool Committees composed of the affected producers. Both the quantity and quality of said water resources may thereby be preserved and the beneficial utilization of the Basin maximized.[2]

1.1.1 The OBMP and the Peace Agreement

Watermaster, at the direction of the Court, began developing the OBMP in 1998 and completed it in July 2000. The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders, described the physical state of the groundwater basin, defined a set of management goals, characterized impediments to those goals, and developed a series of actions that could be taken to remove the impediments and achieve the management goals. This work was documented in the *Optimum Basin Management Program – Phase I Report* (OBMP Phase 1 Report).[3]

[1] Defined terms in the Court Approved Management Agreements will appear with the first letter of each word capitalized.

[2] See Restated Judgment, ¶ 41

[3] WEI. (1999). *Optimum Basin Management Program – Phase I Report*. Prepared for the Chino Basin Watermaster. August 19, 1999. http://www.cbwm.org/docs/engdocs/OBMP%20-%20Phase%20I%20(Revised%20DigDoc).pdf

The four goals of the 2000 OBMP included:

Goal 1 – Enhance Basin Water Supplies

Goal 2 – Protect and Enhance Water Quality

Goal 3 – Enhance Management of the Basin

Goal 4 – Equitably Finance the OBMP

The actions defined by the stakeholders to remove impediments to the OBMP goals were logically grouped into sets of coordinated activities called Program Elements (PEs), each of which included a list of implementation actions and an implementation schedule. The nine PEs defined in the 2000 OBMP included:

PE 1 – Develop and Implement Comprehensive Monitoring Program. The objectives of the comprehensive monitoring program are to collect the data necessary to support the implementation of the other eight PEs and periodic updates to the *State of the Basin Report*.[4]

PE 2 – Develop and Implement Comprehensive Recharge Program. The objectives of the comprehensive recharge program include increasing stormwater recharge to offset the recharge lost due to channel lining, to increase Safe Yield, and to ensure that there will be enough supplemental water recharge capacity available to Watermaster to meet its Replenishment Obligations.

PE 3 – Develop and Implement a Water Supply Plan for Impaired Areas. The objective of this program is to maintain and enhance Safe Yield with a groundwater desalting program that is designed to replace declining agricultural groundwater pumping in the southern part of the basin with new pumping to meet increasing municipal water demands in the same area, to minimize groundwater outflow to the Santa Ana River, and to increase Santa Ana River recharge into the basin.

PE 4 – Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1. The objectives of this land subsidence management program are to characterize the spatial and temporal occurrence of land subsidence, to identify its causes, and, where appropriate, to develop and implement a program to minimize or stop land subsidence.

PE 5 – Develop and Implement Regional Supplemental Water Program. The objective of this program is to improve the regional conveyance and availability of imported and recycled waters throughout the basin.

PE 6 – Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management. The objectives of this water quality management program are to identify water quality trends in the basin and the impact of the OBMP implementation on them, to determine whether point and non-point contamination sources are being addressed by water quality regulators, and to collaborate with water-quality regulators to identify and facilitate the cleanup of soil and groundwater contamination.

[4] See for example: WEI (2019). *Optimum Basin Management Program 2018 State of the Basin Report*. Prepared for the Chino Basin Watermaster. June 2018.

PE 7 – Develop and Implement Salt Management Plan. The objectives of this salinity management program are to characterize current and future salt and nutrient conditions in the basin and to develop and implement a plan to manage them.

PE 8 – Develop and Implement Groundwater Storage Management Program. The objectives of this storage program are to implement and periodically update a storage management plan that prevents overdraft, protects water quality, and ensures equity among the Parties, and to periodically recalculate Safe Yield. This PE explicitly defined the storage management plan, including a "Safe Storage Capacity" for the managed storage of 500,000 acre-feet (af)–inclusive of Local and Supplemental Storage and Storage and Recovery Programs.

PE 9 – Develop and Implement Storage and Recovery Programs. The objectives of this conjunctive use program are to develop Storage and Recovery Programs that will provide broad mutual benefit to the Parties and ensure that Basin Water and storage capacity are put to maximum beneficial use while causing no Material Physical Injury (MPI).

The PEs and their associated implementation actions were incorporated into a recommended management plan. The Parties used the management plan as the basis for developing the OBMP Implementation Plan and an agreement (the Peace Agreement) to implement it. The OBMP Implementation Plan is Exhibit B to the Peace Agreement. The Peace Agreement was reviewed in a programmatic environmental impact report (PEIR) that was certified by the Inland Empire Utilities Agency (IEUA) in July 2000.

The Parties entered into the Peace Agreement in June 2000. Under Resolution 2000-05,[5] Watermaster adopted the goals and plans of the OBMP Phase 1 Report and agreed to proceed in accordance with the Peace Agreement and the OBMP Implementation Plan. Following a July 2000 hearing, the Court directed Watermaster to proceed in a manner consistent with the Peace Agreement in order to implement the OBMP and received and filed the PEIR.

For the purposes of the discussions in this report, the term "OBMP" refers to the collective programs implemented by Watermaster and others (e.g. IEUA, Chino Basin Desalter Authority [CDA], etc.) pursuant to the Peace Agreements, the OBMP Implementation Plan, the PEIR, and any amendments to these documents.

1.1.2 2007 Supplement to the OBMP Implementation Plan and the Peace II Agreement

The work to develop the OBMP determined that the groundwater production of the Chino Basin Desalters would ultimately need to be 40,000 acre-feet per year (afy) to accomplish the goals of the OBMP. The Chino I Desalter production capacity prior to the Peace Agreement was 8 million gallons per day (mgd; 9,000 afy). The Peace Agreement provided for the expansion of the Chino I Desalter to up to 14 mgd (15,700 afy) and the construction of the Chino II Desalter, with a production capacity of 10 mgd. The Peace Agreement required a minimum combined Desalter production capacity of 20 mgd (22,400 afy) and it committed the Parties to developing expansion and funding plans for the remaining capacity within five years of approval of the Peace Agreement. The Parties developed the Peace II Agreement, which included provisions to expand the desalting capacity such that groundwater production reaches

[5] Chino Basin Watermaster. (2002). *Twenty Fourth Annual Report Fiscal Year 2000-2001*; Appendix O http://www.cbwm.org/docs/annualrep/24th%20Annual%20Report%20-%20Approved.pdf

40,000 afy. The Peace II Agreement introduced Re-operation[6] to achieve Hydraulic Control[7] of the Chino Basin and maintain Safe Yield. Hydraulic Control is both a goal of the OBMP and a requirement of the maximum-benefit salt-and-nutrient management plan (maximum benefit SNMP) that was developed by Watermaster and the IEUA under PE 7 to enable the expansion of recycled water recharge and reuse throughout the basin under PEs 2 and 5.

The Parties executed the Peace II Agreement in 2007, which included a supplement to the OBMP Implementation Plan to expand the Chino Basin Desalters to 40,000 afy of groundwater pumping, to incorporate Re-operation and Hydraulic Control, and to resolve other issues. There were no changes to the storage management plan in the OBMP Implementation Plan.

The IEUA Board certified a supplemental environmental impact report (SEIR) for the Peace II Agreement in 2010.

1.1.3 2017 Addendum to the 2010 Peace II SEIR

In 2016, Watermaster identified the need to update the storage management plan in the OBMP Implementation Plan because the total amount of water in managed storage accounts was projected to exceed the Safe Storage Capacity (SSC) limit of 500,000 af defined in the 2000 OBMP. In 2017, the IEUA adopted an addendum to the SEIR to provide a "temporary increase in the Safe Storage Capacity from 500,000 af to 600,000 af for the period of July 1, 2017 through June 30, 2021 […] until a comprehensive re-evaluation of the Safe Storage Capacity value/concept can be completed before June 30, 2021."[8] The addendum was supported with engineering work that demonstrated that this temporary increase in SSC would not cause MPI or loss of Hydraulic Control.

1.1.4 Grant Funding for OBMP Implementation

The OBMP provided the certainty necessary for Watermaster, the IEUA, the Parties, and regulators to mobilize for rapid implementation of the OBMP PEs as well as to attract significant outside funding for the design and construction of facilities. The following are a few examples:

- Under PE 2, having recharge master plans (RMPs) that clearly defined the financial and water-supply benefits of the projects enabled the IEUA to obtain about $40 million in grant funding and $16 million in low-interest loans to construct the recharge improvements recommended in the 2001 RMP and 2013 RMP Update, covering about 70 percent of the total capital costs.
- In support of PE 3, Watermaster, the IEUA and Western Municipal Water District successfully obtained about $148 million in grants for the design and construction of the Chino Basin Desalters, including Desalter I expansion, Desalter II, the Chino Creek wellfield, and the current

[6] Re-operation is the controlled overdraft of the basin by the managed withdrawal of groundwater pumping for the Chino Basin Desalters and the potential increase in the cumulative un-replenished pumping from the 200,000 acre-feet authorized by paragraph 3 of the Engineering Appendix Exhibit I to the Restated Judgment, to 600,000 acre-feet for the express purpose of securing and maintaining Hydraulic Control as a component of the Physical Solution.

[7] Hydraulic Control is the elimination of groundwater discharge from the Chino-North Groundwater Management Zone to the Santa Ana River or its reduction to less than 1,000 afy.

[8] Tom Dodson & Associates. (2017). *Addendum No. 1 to the Optimum Basin Management Program Project*. Page 2.

Desalter II expansion to incorporate treatment of point-source contamination associated with the South Archibald trichloroethene (TCE) plume. This funding has covered about 45 percent of the total capital costs of these facilities.

- In support of PEs 2 and 5, the IEUA successfully obtained about $64 million in grants and $115 million in low-interest loans for the construction of the recycled water distribution system, covering about 70 percent of the total capital costs.

In total, Watermaster and the IEUA have obtained over $230 million in grant funding and over $130 million in low-interest loans to implement the OBMP.

1.2 Need for the 2020 OBMP Update

The current OBMP contains a set of management programs that improve the reliability and long-term sustainability of the Chino Basin and the water supply reliability of the Judgment Parties. The framework for developing the OBMP—including the goals of the Parties, the hydrologic understanding of the basin, the institutional and regulatory environment, an assessment of the impediments to achieving the Parties' goals, and the actions required to remove the impediments and achieve the goals—were all based on 1998-1999 conditions.

As of 2019, many of the projects and management programs envisioned in the 2000 OBMP have been implemented; though some have not. The understanding of the hydrology and hydrogeology of the Chino Basin has improved since 2000, and new water-management issues have been identified. The strategic drivers and trends that shaped the goals and activities of the OBMP in the late 1990s have since changed. And, there are several drivers and trends in today's water management space that may challenge the ability of the Parties to protect their collective interests in the Chino Basin and their water supply reliability.

Exhibit 1 characterizes the drivers and trends shaping water management and their basin management implications for the Parties. "Drivers" are external forces that cause changes in the Chino Basin water space, such as climate change, regulations, and funding. Grouped under each driver are expected trends that emanate from that driver. For example, trends associated with climate change include reduced groundwater recharge, increased evaporation, and reduced imported water supply. The relationship of the drivers/trends to the management implications are shown by arcs that connect trends to implications. For example, a management implication of reduced groundwater recharge is the reduction of the Chino Basin Safe Yield.

The drivers, trends, and implications were first identified in the OBMP White Paper and served as the initial rationale for recommending an update to the OBMP. Exhibit 1 represents the final characterization of the drivers, trends, and implications, based on stakeholder input during the process to update the OBMP. The basin management implications that form the stakeholders' rationale for the 2020 OBMP Update are:

- Reductions in Chino Basin Safe Yield
- Reduced imported water availability and increased cost
- Imported water quality degradation
- Chino Basin water quality degradation
- Inability to pump groundwater with existing infrastructure
- Increased cost of groundwater use
- Recycled water quality degradation
- Reduced recycled water availability and increased cost

- Increased cost of Basin Plan compliance

Additionally, the PEIR and SEIR for the OBMP are nineteen and nine years old, respectively. Knowledge of the basin's characteristics has improved since these documents were adopted, water management challenges have intensified, and environmental considerations have changed. An updated PEIR will better support decision-making, investment, and grant applications for ongoing and new management actions under the OBMP.

Finally, it is anticipated that it will become increasingly difficult to secure grants and low-interest loans due to increased competition in the future. Most grant and low-interest loan programs require, or heavily favor, projects that are within watersheds and groundwater basins with adopted integrated regional management plans, groundwater sustainability plans, or their equivalents. The 2020 OBMP Update is equivalent to a regional water resources and groundwater management plan that, in addition to allowing the implementation of the Physical Solution, will enable the stakeholders to be competitive in applying for grants and low-interest loans.

For these reasons, Watermaster and the Parties need to update the OBMP and its Implementation Plan, and perform the CEQA process, to set the framework for the next 20 years of basin-management activities.

1.3 Stakeholder Process for the 2020 OBMP Update

The 2020 OBMP Update was facilitated using a collaborative stakeholder process like that employed for the development of the 2000 OBMP. Throughout 2019, Watermaster held a series of public listening sessions to support the development of the 2020 OBMP Update. The purpose of the listening sessions was to obtain information, ideas, and feedback from the stakeholders to define their issues, needs, and wants; their collective goals for the 2020 OBMP Update; impediments to achieving the goals; the management actions required to remove the impediments; and a proposed plan to implement the management actions.

Watermaster established an OBMP Update Team to facilitate the stakeholder process, composed of Watermaster staff, Watermaster legal counsel, engineers and scientists from Wildermuth Environmental Inc. (WEI; Watermaster's engineering consultant), and IEUA staff. The OBMP Update Team provided key information prior to and during each listening session to enable the stakeholders to provide their input on each topic discussed. The objectives were to communicate the process for updating the OBMP, to ensure that the ideas and opinions of every stakeholder were heard, to present the information that will be considered for inclusion in the OBMP Update, and to ensure the stakeholder feedback is captured correctly.

The OBMP Update Team held eight listening sessions on the following dates:

- Listening Session 1: January 15, 2019
- Listening Session 2: February 12, 2019
- Listening Session 3: March 21, 2019
- Listening Session 4: May 16, 2019
- Listening Session 5: July 31, 2019
- Listening Session 6: September 11, 2019
- Listening Session 7: October 17, 2019
- Listening Session 8: December 11, 2019

The objectives of the first four listening sessions were (1) to confirm the need to update the OBMP; (2) to identify the issues, needs, and wants of the stakeholders; (3) to define goals for the 2020 OBMP

Update; and (4) to identify new and revised activities that could be included in the 2020 OBMP Update to remove impediments to achieving the 2020 OBMP Update goals. The *2020 OBMP Scoping Report* (Scoping Report) summarized and integrated the work products of these four listening sessions and described the recommended scope of work to implement each of the "2020 OBMP Update Activities" defined by the stakeholders. The final Scoping Report, including responses to stakeholder comments, is included herein as Appendix C and is discussed further in Section 2.2 of this report.

The objectives of Listening Sessions 5 and 6 were to present and obtain feedback on the scopes of work described in Section 3 of the Scoping Report. The objective of Listening Session 7 was to present and obtain feedback on the integration of the 2020 OBMP Update Activities defined in the Scoping Report with the 2000 OBMP PEs. The objectives of Listening Session 8 were to present and obtain feedback on the recommended 2020 OBMP management plan documented in the *Draft 2020 OBMP Update Report* and to begin discussions on the 2020 OBMP Implementation Plan and implementation agreements.

Appendix D to this report documents the stakeholder attendance at the listening sessions. All documents related to the 2020 OBMP Update, including meeting materials from the listening sessions and report deliverables, are available on the Watermaster's website.[9]

1.4 Organization and Use of this Report

This *2020 OBMP Update Report* describes the 2020 OBMP Update process (Section 1), the OBMP goals and new activities for the 2020 OBMP Update (Section 2), the status of the OBMP PEs and ongoing activities within them (Section 3), and the recommended 2020 OBMP management plan – inclusive of ongoing and new activities (Section 4). The management plan in Section 4 will form the foundation for the Parties to develop a final implementation plan (2020 OBMP Implementation Plan) and the agreements necessary to implement it. Exhibit 2 shows the parallels between the 2000 and 2020 documentation and the subsequent processes to develop implementation plans and agreements for approval by the Court and environmental review under CEQA.

Implementation of the management plan described in Section 4 may or may not result in the construction of new facilities, and nothing in this document obligates Watermaster or the Parties to implement the optimization recommendations. However, some of the implementation actions included in the management plan are required by Watermaster to administer the Physical Solution or comply with other Watermaster or regulatory requirements. These required implementation actions may or may not result in the development and implementation of projects.

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[9] http://www.cbwm.org/OBMPU.htm

2.0 2020 OBMP Goals and Activities

2.1 OBMP Goals

The issues, needs, and wants of the stakeholders form the basis of the management goals of the 2020 OBMP Update and inform the identification of impediments to the goals as well as the action items to remove the impediments. Through the listening session process, 57 unique needs and wants were identified by the stakeholders. The classes of identified issues were effectively the same as the implications for basin management defined in Exhibit 1. Exhibit 3 is a matrix, summarizing the needs and wants of the stakeholders, organized by basin management issue (rows) and showing attribution to stakeholders that share each need/want (columns).

Through the assessment of basin management issues, needs, and wants, the stakeholders concluded that the goals defined in the 2000 OBMP are still relevant today. The Parties' intent for each goal of the 2020 OBMP Update, as documented in the Scoping Report, are:

> ***Goal No. 1 - Enhance Basin Water Supplies.*** The intent of this goal is to increase the water supplies available for Chino Basin Parties and improve water supply reliability. This goal applies to Chino Basin groundwater and all other sources of water available for beneficial use.
>
> ***Goal No.2 - Protect and Enhance Water Quality.*** The intent of this goal is to ensure the protection of the long-term beneficial uses of Chino Basin groundwater.
>
> ***Goal No.3 - Enhance Management of the Basin.*** The intent of this goal is to encourage sustainable management of the Chino Basin to avoid Material Physical Injury, promote local control, and improve water-supply reliability for the benefit of all Chino Basin Parties.
>
> ***Goal No. 4 - Equitably Finance the OBMP***. The intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation.

The far right-hand column in Exhibit 3 illustrates the nexus of the OBMP goals to the needs and wants of the Parties.

2.2 New Activities to Achieve the Goals of the 2020 OBMP Update

There are physical, institutional, and financial impediments to achieving the 2020 OBMP goals. The issues, needs, and wants of the stakeholders shown in Exhibit 3 recognize these impediments. The stakeholders identified and described 12 activities that, if implemented, would address their issues, needs, and wants. The 12 activities, as initially defined by the stakeholders, are listed in Exhibit 4 (the activities are identified by the letters A through L). Exhibit 3 illustrates which of the 12 activities the stakeholders believe have the potential to address each of their needs and wants. 55 of the 57 needs and wants were identified as addressed by one or more of the proposed activities.

Exhibit 5 illustrates the nexus of the OBMP goals, the impediments to achieving these goals, the stakeholder-defined activities to remove the impediments, and the potential outcomes (i.e. the implications) of implementing each activity. Exhibit 5 also shows the nexus of each activity to addressing the issues, needs, and wants of the stakeholders, categorized by basin management issues. In the process of describing the nexus of the goals and activities shown in Exhibit 5, it was identified that some of the activities in Exhibit 4 are related enough to be combined into a single management activity. Nine of the activities (A, B, C, D, E, F, G, K, and L) were combined into seven basin management activities. The remaining three activities (H, I, and J) were identified as actions that could either be accomplished by incorporating them into the scopes of work of every activity or were more appropriate for inclusion within an implementation agreement.[10]

The seven basin management activities described in the Scoping Report are:[11]

Activity A – Increase the capacity to store and recharge storm and supplemental water

Activity B – Develop, implement, and optimize Storage and Recovery Programs

Activity CG – Identify and implement regional conveyance and treatment projects/programs and optimize the use of all water supply sources

Activity D – Maximize the reuse of recycled water produced by the IEUA and others

Activity EF – Develop and implement a groundwater-quality management plan to address contaminants of emerging concern

Activity K – Develop a management strategy within the maximum-benefit salt and nutrient management plan to ensure compliance with recycled water recharge dilution requirements.

Activity L – Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance requirements

The Scoping Report described each of the seven activities at the detail required to define a scope of work to implement them. The potential outcomes described in Exhibit 5 provided the basis for the scope of each activity. For each activity, the Scoping Report includes: a description of the activity, the need and function of the activity—including supporting technical demonstrations, the activity's relationship to the OBMP PEs, a recommended scope of work to perform the activity to achieve the desired outcomes, a preliminary schedule for implementing the tasks that comprise the scopes of work, and a budget-level cost estimate to implement the initial tasks that could reasonably be estimated on currently available information.

Each activity is a management process to optimize some aspect of basin management, such as water quality (EF, K) or managed recharge (A). Thus, the scope of work for each activity represents the methodical process to characterize and analyze the basin management challenge (including technical data and institutional information), to define potential management alternatives, and to select the optimum management solution(s). Each management process is generally composed of four phases:

(1) Scoping (S) – In this phase, the stakeholders convene to precisely articulate the objectives of the management process and refine the scope of work, cost, and schedule to execute it.

(2) Evaluate the need for projects or other management solutions (PN) – In this phase, available and/or new data and information are compiled and analyzed to characterize and demonstrate the need for management programs or projects to achieve the stakeholder objectives defined in the scoping phase.

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[10] See the *2020 OBMP Scoping Report* (included herein as Appendix C) for more details on how Activities H, I, and J can be incorporated in the activity scopes of work and/or the 2020 OBMP Implementation Plan agreement(s).

[11] The activity names listed here have been simplified from the original descriptions defined by the stakeholders and shown in Exhibit 4.

(3) Define and evaluate management alternatives (PE) – The evaluation phase includes the following generalized steps: develop planning, screening, and evaluation criteria; identify the potential program or project alternatives; develop reconnaissance-level engineering design and operating plans for project alternatives; develop an engineering cost opinion for each alternative; describe how each alternative could be implemented and financed; evaluate alternatives based on the evaluation criteria; and select the preferred program or project alternative.

(4) Implementation (I) – In this phase, the preferred program or project alternative is implemented subject to developing the necessary agreements between participating Parties. If a project is identified, implementation also includes: preparing the preliminary design of the recommended alternative, preparing the environmental documentation that will tier-off the 2020 OBMP Update PEIR, preparing a financial plan for constructing the recommended alternative, preparing final design of the recommended alternative, acquiring permits for constructing and operating the recommended alternative, and constructing the recommended alternative.

The end of each phase represents a check in point where the scope of work can be adapted to deal with changed conditions or an off-ramp where a go/no-go decision can be made to continue with the next phase of the management process. Thus, activities may or may not result in the design and implementation of management plans or facilities.

Exhibits 6 through 12 summarize the key features of each of the seven activities described in detail in the Scoping Report. For each activity, the exhibit summarizes the need and objectives, the scope of work, and a general implementation schedule with go/no-go decision points identified. The scopes of work are divided into tasks, and for each task, the following are identified: the corresponding management process phase (S, PN, PE, I), the expected outcomes, Watermaster's role in implementing the task (if any), and whether Watermaster deems the outcomes as required to administer the Physical Solution or comply with other Watermaster or regulatory requirements.

Implementation of the management processes characterized in Exhibits 6 through 12 may or may not result in the construction of new facilities, and nothing in this document obligates Watermaster or the Parties to implement the scopes as described. In activity implementation, for those outcomes that are deemed necessary to administer the Physical Solution or comply with other requirements, Watermaster will provide for the opportunity to revise the scopes of work and cost in the scoping phase. Any revisions will be subject to the discretion of Watermaster to ensure that the final scope of work achieves the required outcomes.

The following sections summarize the seven 2020 OBMP Update Activities identified by the Parties and describes the new implementation actions for inclusion in the 2020 OBMP Update Management Plan (in Section 4) to accomplish the objectives of the activities.

2.2.1 Activity A – Increase the capacity to store and recharge storm and supplemental water

The stakeholders have identified a lost opportunity for stormwater recharge in the basin and a limitation of Watermaster and the IEUA's existing economic selection criteria for new recharge projects. The use of the existing criteria resulted in a recommendation in the 2018 RMP Update (RMPU) that no new recharge projects be implemented. Thus, the Activity A objectives are (1) to maximize stormwater capture pursuant to Watermaster's diversion permits,[12] (2) to promote the long-term balance of recharge and discharge, (3) to ensure sufficient supplemental water recharge capacity for future replenishment, (4) to reduce dependence on imported water by maintaining or enhancing Safe Yield, (5) to improve water quality, and (6) to ensure a supply of dilution water to comply with recycled water recharge permit requirements. For the remainder of this report, the term "recharge" is inclusive of diverting, storing, and recharging storm and supplemental waters.

The Scoping Report identified that based on the alignment of the scope of work to achieve the outcomes of Activity A with those of the RMPU process, implemented through OBMP PE 2, the outcomes of Activity A can be accomplished as part of the existing RMPU process, which is updated at least every five years as required by the Court. Thus, implementation of the scope of work characterized in the Scoping Report and summarized in Exhibit 6 will result in the completion of the required 2023 RMPU, including obtaining consensus on its objectives, developing an implementation and financing plan, preparing the report, and implementing recharge projects. These outcomes are required by Watermaster to ensure that the yield of the basin is maintained and that the supplemental recharge capacity is sufficient to meet Replenishment Obligations. Although not required, the next (or a future) RMPU process could accomplish the objectives of Activity A by updating the project selection criteria and considering projects that will meet other needs of the Parties, such as providing additional recharge capacity for Storage and Recovery Programs or addressing pumping sustainability issues.

Based on the scope of work and alignment with the existing PE 2 implementation actions, there are no new implementation actions required for inclusion in the 2020 OBMP Update to accomplish Activity A.

2.2.2 Activity B - Develop, implement, and optimize Storage and Recovery Programs

The Peace Agreement states that "Watermaster shall prioritize its efforts to regulate and condition the storage and recovery of water developed in a Storage and Recovery Program for the mutual benefit of the Parties to the Judgment and give first priority to Storage and Recovery Programs that provide broad mutual benefits."[13] For this and other reasons, the Parties desire to develop "optimized" Storage and Recovery Programs that avoid potential MPI and provide broad benefits, such as increased water-supply reliability, protected or enhanced Safe Yield, improvements to water quality, and reduced cost of OBMP implementation.

The objective of Activity B is to prepare a Storage and Recovery Program guidance document in a collaborative setting that clearly articulates the specific objectives of the Parties and the required benefits to be realized from Storage and Recovery Programs. Implementation of the scope of work described in the Scoping Report and summarized in Exhibit 7 will result in: (1) consensus on the objectives and desired benefits of Storage and Recovery programs, (2) conceptual descriptions of various types of Storage and Recovery programs that achieve the defined objectives and benefits and are consistent with the *2020 Storage Management Plan*, (3) reconnaissance-level project designs and

[12] Watermaster holds three permits with the State Water Resources Control Board (State Board) for the diversion and recharge of stormwater in trust for the Parties. The San Bernardino County Flood Control District (SBCFCD) is a co-permittee for two of these permits, 19895 and 20753. Each permit defines a maximum diversion limit and the period over which diversions are allowed to occur each year (diversion season): (1) Permit 19895 has a diversion limit of 15,000 acre-feet (af) from November 1 to April 30, (2) Permit 20753 has a diversion limit of 27,000 af from October 1 to May 1, and (3) Permit 21225 has a diversion limit of 68,500 af from January 1 to December 31.

[13] See Peace Agreement, § 5.2(c)

operating plans and the costs of the Storage and Recovery Program alternatives, and (4) the development of a *Storage and Recovery Program Master Plan* that will support the design of Storage and Recovery Programs that are consistent with the *2020 Storage Management Plan* and the Peace Agreement. Watermaster deems the development of a *Storage and Recovery Program Master Plan* a necessary outcome so that Watermaster is able to review, condition, and approve Storage and Recovery Program applications in a manner that is uniform, predictable, and consistent with the Peace Agreement.

Based on the scope of work, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity B are:

- Develop a *Storage and Recovery Master Plan* to support the design of optimized Storage and Recovery Programs that are consistent with the 2020 Storage Management Plan and to provide the Watermaster with criteria to review, condition, and approve applications in a manner that is consistent with the Judgment and the Peace Agreement.

2.2.3 Activity CG - Identify and implement regional conveyance and treatment projects/programs and optimize the use of all water supply sources

The stakeholders have identified basin management challenges, such as land subsidence and poor water quality, that could limit their ability to fully exercise their pumping rights using existing infrastructure. Thus, the Activity CG objectives are to optimize the use of all sources of water available to the Parties to meet their demands despite these basin management challenges and to potentially help mitigate these challenges. Implementation of the scope of work characterized in the Scoping Report and summarized in Exhibit 8 will result in (1) a plan that describes the universe of water reliability concerns of the Parties, the opportunities and limitations of existing/planned infrastructure to meet the reliability goals, conceptual project designs and operating plans, and the costs of the reliability alternatives; and (2) implementation of the selected reliability project(s). As identified in the Scoping Report, the Activity CG scope of work is effectively the same as the IEUA's existing Integrated Water Resources Plan (IRP) process that addresses water supply reliability for its member agencies. Activity CG is an expansion that would address the water supply reliability concerns of all Parties to the Judgment. Currently, IEUA is preparing its 2020 IRP and other related planning efforts with its member agencies. This effort, or future IRP updates could be expanded by others to include neighboring agencies, including Three Valleys Municipal Water District (TVMWD), Western Municipal Water District (WMWD), or others. To create a coordinated planning effort, any of these agencies could lead and coordinate the collaborative regional effort on behalf of the Parties.

Although this activity optimizes the management of all water supplies in the Chino Basin, Watermaster does not deem these outcomes necessary for administration of the Physical Solution or compliance with other Watermaster or regulatory requirements.

Based on the scope of work, and considering its overlap with IEUA planning efforts, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity CG are:

- The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish and/or expand integrated water resources planning efforts to address water supply reliability for all Watermaster Parties.
- Watermaster will support the IEUA, TVMWD, WMWD, and/or others in their efforts to improve water supply reliability to ensure those efforts are integrated with Watermaster's groundwater management efforts.

These implementation actions are included as part of the 2020 OBMP Update to complement existing regional planning efforts, not to duplicate them.

2.2.4 Activity D - Maximize the reuse of recycled water produced by the IEUA and others

The objective of Activity D is to maximize the reuse of recycled water produced by the IEUA and other publicly owned treatment works (POTWs) in proximity to the Chino Basin to meet future demands and improve local water-supply reliability, especially during dry periods. Expanded reuse activities could include direct non-potable reuse (landscape irrigation or industrial uses), artificial recharge by spreading and/or injection (indirect potable reuse), and direct potable reuse. Increasing recycled water reuse is an integral part of the OBMP goal to enhance water supplies. The direct use of recycled water increases the availability of native and imported waters for higher-priority beneficial uses. And, the Judgment states that Watermaster shall give high priority to maximizing the beneficial use of recycled water for replenishment purposes.[14] Implementation of the scope of work characterized in the Scoping Report and summarized in Exhibit 9 will result in (1) a plan that describes the objectives for optimizing and maximizing recycled water reuse, the demand and opportunities for increased recycled water reuse, the impacts of recycled water reuse and required mitigation, conceptual project designs and operating plans, and the costs of the reuse project alternatives; and (2) implementation of the selected recycled water reuse project(s).

As identified in the Scoping Report, the scope of work is similar to the IEUA's existing planning efforts for the IRP and Chino Basin Program (CBP) on behalf of its member agencies. These efforts, or similar future efforts, could be expanded by others to include neighboring agencies, including the TVMWD, the WMWD, or others. To create a coordinated planning effort, any of these agencies could lead and coordinate the collaborative regional effort to maximize recycled water reuse on behalf of the Parties.

Although this activity maximizes the management of recycled water supplies in the Chino Basin, Watermaster does not deem these outcomes necessary for administration of the Physical Solution or compliance with other Watermaster or regulatory requirements. However, any expansion of recycled water reuse would be subject to Watermaster review to ensure compliance with the maximum benefit SNMP.

Based on the scope of work, and considering its overlap with IEUA planning efforts, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity D are:

- IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will expand future recycled water reuse planning efforts to maximize the reuse of all available sources of recycled water.
- Watermaster will support the IEUA, TVMWD, WMWD, and/or others in their efforts to maximize recycled water reuse to ensure these efforts are integrated with Watermaster's groundwater and salinity management efforts.

These implementation actions are included as part of the 2020 OBMP Update to complement existing regional planning efforts, not to duplicate them.

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[14] See Restated Judgment, ¶ 49(a)

2.2.5 Activity EF - Develop and implement a groundwater-quality management plan to address contaminants of emerging concern

Groundwater contaminants are present across the Chino Basin, new contaminants are being discovered, and water-quality regulations are evolving and becoming more restrictive. These trends threaten to limit the beneficial use of groundwater and increase the cost of the water supply. The objectives of Activity EF are to characterize the water-quality challenges across the Chino Basin and identify the most efficient means to address these challenges, including the potential for multi-benefit collaborative projects to ensure that groundwater is put to beneficial use. Implementation of the scope of work described in the Scoping Report and summarized in Exhibit 10 will result in (1) the development and implementation of initial and long-term emerging contaminants monitoring plans, (2) a water-quality assessment of the Chino Basin that characterizes the need for a groundwater-quality management plan, and (3) the development and implementation of a *Groundwater-Quality Management Plan*. The *Groundwater-Quality Management Plan* would document the most current water-quality assessment, the long-term monitoring and analysis plan, the reconnaissance-level engineering designs and operating plans for alternative water quality improvement projects, the selected project(s) for implementation, and an implementation plan.

As previously noted, Paragraph 41 of the Judgment provides Watermaster the discretion to develop an OBMP that includes both water quantity and water quality considerations. If water quality is not effectively managed, the Parties may not be able to utilize their water rights, which could result in negative impacts to the basin, such as reductions in net recharge, loss of hydraulic control, and movement of contaminant plumes. Effective management of water quality in the Basin to preserve maximum beneficial use can only be accomplished through a systematic assessment of the emerging contaminant threats to the use of groundwater resources, and thoughtfully preparing a plan to respond to those threats. A *Groundwater-Quality Management Plan* would provide the Parties with the comprehensive data and information, including best practices for monitoring, required to understand and manage the future water-quality challenges that could impact the Parties' ability to fully utilize their pumping rights. Hence, Watermaster deems the outcomes of Activity EF as required for administration of the Physical Solution.

Based on the scope of work, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity EF are:

- Develop and implement an initial emerging contaminants monitoring plan.
- Prepare a water quality assessment of the Chino Basin to evaluate the need for a Groundwater Quality Management Plan.
- Develop and implement a long-term emerging contaminants monitoring plan.
- Develop and implement a Groundwater Quality Management Plan.

2.2.6 Activity K - Develop a management strategy within the maximum-benefit salt and nutrient management plan to ensure compliance with recycled water recharge dilution requirements

Watermaster and the IEUA are co-permittees for the Chino Basin maximum-benefit SNMP incorporated in the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan). The maximum-benefit SNMP was developed pursuant to PE 7 (see Section 3.2.7 for additional details) to enable the recharge and reuse of recycled water planned in PEs 2 and 5. It defines the management actions that Watermaster and IEUA must take to manage total dissolved solids (TDS) and nitrate concentrations in Chino Basin groundwater and in the IEUA's recycled water and the TDS and nitrate concentration limitations for recycled water reuse activities. The objective of Activity K is to determine if compliance with the recycled water recharge dilution requirements defined in Watermaster and the IEUA's maximum-benefit SNMP can be achieved under existing management plans and, if not, to develop a plan to achieve compliance. Implementation of the scope of work described in the Scoping Report and summarized in Exhibit 11 will result in (1) the periodic characterization and understanding of the ability to comply with the TDS and nitrate dilution requirements in the short- and long-term; and if non-compliance is projected, (2) a plan that describes the conceptual designs, operating plans, and costs of alternative salt-offset programs or projects, and (3) implementation of the selected salt-offset program or projects. Because the maximum-benefit SNMP is an explicit requirement of Basin Plan, these are required outcomes for Watermaster and the IEUA to continue the recycled water recharge program.

Based on the scope of work, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity K are:

- Periodically prepare TDS and nitrate concentration projections to evaluate compliance with the maximum benefit SNMP dilution requirements, and, if necessary, based on the outcome of the evaluation, prepare a plan and schedule to implement a salt-offset compliance strategy.

2.2.7 Activity L – Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance requirements

Watermaster conducts data-collection programs and prepares reports and data deliverables to comply with regulations, to fulfill its obligations under its agreements and Court orders, to comply with its requirements under CEQA, and to assess the performance of OBMP Implementation. The objective of Activity L is to refine the monitoring and reporting requirements of Watermaster to ensure that the objectives of each requirement are being met efficiently at a minimum cost. Implementation of the Activity L scope of work described in the Scoping Report and summarized in Exhibit 12 will result in (1) the comprehensive review of all monitoring/reporting programs in an open stakeholder process, (2) the development and periodic update of an *OBMP Monitoring and Reporting Work Plan*, and (3) potential revisions to Watermaster's non-discretionary monitoring and reporting programs. Watermaster is required to implement the monitoring and reporting programs to comply with the Judgment and other regulations and obligations; however, these specific outcomes are not required. This activity will allow the Parties to offer more direct input in the implementation of the required monitoring programs, but Watermaster does not deem this outcome necessary to comply with the monitoring requirements.

Based on the scope of work, the new implementation actions for inclusion in the 2020 OBMP Update to accomplish Activity L are:

- Perform review and update of Watermaster's regulatory and Court-ordered monitoring and reporting programs and document them in a work plan: *OBMP Monitoring and Reporting Work Plan*.
- Perform periodic review and update of *the OBMP Monitoring and Reporting Work Plan* and modify the monitoring and reporting programs, as appropriate.

If the above implementation actions are not initiated by the Parties, Watermaster staff and the Watermaster engineer would continue their existing process to periodically review and refine Watermaster's monitoring and reporting efforts to meet all requirements and achieve efficiencies.

3.0 Integration of the 2020 OBMP Update Activities with the 2000 OBMP Program Elements

3.1 Nexus of the 2020 OBMP Update Activities to the 2000 OBMP Program Elements

Through the process of defining the scopes of work to achieve the desired outcomes of the 2020 OBMP Update Activities, it became apparent that the PEs defined in the 2000 OBMP are still relevant today as the overarching program elements of a basin management program. Each of the seven activities in the Scoping Report had objectives and tasks that were directly related to one or more of the 2000 OBMP PEs. Exhibit 13 is a matrix that demonstrates the nexus between the PEs (rows) and the activities (columns) based the PE objectives (listed in Section 1.1 herein) and the objectives of the 2020 OBMP Update Activities (described in Section 2.2 herein). The matrix is symbolized with anchors and dots. Anchors indicate a direct relationship between an activity and a PE (i.e. the activity and the PE have similar or identical objectives and thus the activity can be integrated into the existing PE). Dots indicate an indirect relationship between an activity and a PE (i.e. the activity has the potential to provide benefits to PEs).

Based on this finding, the nine PEs defined in the 2000 OBMP will be retained for the 2020 OBMP Update. Each of the seven activities, and the associated implementation actions, was mapped to the PE to which it is anchored in Exhibit 13. Based on the need for ongoing activities under the existing PE and the new activities defined by the stakeholders, the implementation actions were modernized and updated.

3.2 OBMP Program Elements – Progress and Ongoing Management Actions

For each of the nine PEs, this section describes the objectives and implementation actions of the PE as established in 2000, implementation progress since 2000, and ongoing management activities, including the new actions to be incorporated in the 2020 OBMP, as identified in Section 2.2 of this report.

3.2.1 Program Element 1. Develop and Implement Comprehensive Monitoring Program

The 2000 OBMP included PE 1—*Develop and Implement Comprehensive Monitoring Program* —to provide the information necessary to support the implementation of all other OBMP PEs and to evaluate their performance. The types of monitoring programs called for by PE 1 in the OBMP included:

- Groundwater-level monitoring
- Groundwater-quality monitoring
- Groundwater-production monitoring
- Surface-water discharge and quality monitoring (including managed artificial recharge)
- Ground-level monitoring
- Well construction, abandonment, and destruction

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 1 below. Each implementation action in Table 1 is categorized as a one-time or ongoing action, and the right-most column of the table indicates if the action was implemented.

Table 1. Program Element 1 – Implementation Actions Defined in the 2000 OBMP*

Implementation Actions and Schedule	One-time/ Ongoing	Implemented?
Years 1 through 3		
*Perform initial tasks to survey sites and design and set up all long-term monitoring programs for groundwater level, groundwater quality, ground level, surface water, and recharge monitoring programs.	One-time	✓
Complete initial meter installation program for overlying agricultural pool.	One-time	✓
Develop agreements with county and state agencies regarding notification of new well drilling. Well construction and related information will be requested as new wells are constructed. Prepare and update a list of abandoned wells and coordinate with the counties to ensure that abandoned wells are destroyed properly.	One-time	✓
Years 4 through 50		
*Start and continue all groundwater level, groundwater production, groundwater quality, ground level (including remote sensing), surface water, and well construction/destruction monitoring programs. Key wells should be relocated as necessary.	Ongoing	✓

**Note: Actions marked with "*" are combined from multiple actions in the OBMP Implementation Plan.*

3.2.1.1 Implementation Progress since 2000

Watermaster began implementing its monitoring programs as part of the development of the OBMP. Pursuant to the OBMP Implementation Plan, long-term plans for monitoring groundwater production, groundwater level, groundwater quality, ground level (including remote sensing), surface water, and well construction/destruction monitoring programs have been developed, implemented, and updated as necessary.

The monitoring programs have evolved over time to ensure that the data and information acquired not only meet the OBMP requirements, but also other regulatory requirements and Watermaster obligations under agreements, Court orders, and CEQA. In some instances, the monitoring programs were expanded to satisfy new basin-management initiatives and regulations. In other instances, the scope of the monitoring programs has been reduced with periodic reevaluation and redesign to achieve the monitoring objectives at reduced cost. Table 2 below is a list of each Watermaster monitoring and reporting requirement and the entities that require the monitoring and reporting. The Scoping Report provides a comprehensive overview of the status of the monitoring programs as of 2018.

Watermaster developed a centralized environmental database to store, manage, and visualize its datasets. Data management includes a detailed quality assurance and quality control protocol. The database and the database-management procedures ensure the quality and accuracy of the data, allow for efficient data exploration and analysis, and include standardized reports and data exports in formats for regulatory data deliverables or further analysis (e.g. creation of model input files).

Table 2. Watermaster Monitoring and Reporting Requirements

Monitoring and Reporting Requirement	Requiring Entity					
	Court	State Board	Regional Board	California DFW	California DWR	CEQA
Water Rights Compliance Annual Reports		X		X		
SGMA Annual Report for Adjudicated Basins					X	
Biannual Evaluation of the Cumulative Effect of Transfers	X					
Biannual Evaluation of the Balance of Recharge and Discharge	X					
Annual Finding of Substantial Compliance with the Recharge Master Plan	X					
Annual Report of Compliance with SB 88 and SWRCB Regulations for Measurement and Reporting of Diverted Surface Water		X				
Safe Yield Recalculation	X					
Recharge Master Plan Update (RMPU)	X					
State of the Basin Report	X					
California Statewide Groundwater Elevation Monitoring Program (CASGEM)					X	
Chino Basin Maximum Benefit Annual Report			X			
Annual Report of the Prado Basin Habitat Sustainability Committee						X
Water Recycling Requirements for the Chino Basin Recycled Water Groundwater Recharge Program			X			
Annual Report of the Ground-Level Monitoring Committee	X					
OBMP Semi-Annual Status Reports	X					

3.2.1.2 Ongoing implementation actions for the 2020 OBMP

The following summarizes each of the Watermaster's monitoring and data-collection programs that need to continue to be implemented to satisfy the requirements of the OBMP and the other requirements summarized in Table 2 above. Section 4.1 of this report summarizes the 2020 OBMP Management Plan for PE 1.

Groundwater-production monitoring. Watermaster uses groundwater-production data to quantify and levy assessments pursuant to the Judgment. Estimates of production are also essential inputs to recalibrate Watermaster's groundwater flow model, which is used to inform the recalculation of Safe

Yield, evaluate the state of Hydraulic Control, perform MPI evaluations, and support many other Watermaster initiatives. Members of the Appropriative and Overlying Non-Agricultural Pools and CDA record their own meter data and submit them to Watermaster. For Agricultural Pool wells, Watermaster performs a field program to install totalizing flow meters, repair or replace broken meters, and visit the wells quarterly to record the metered data. Watermaster has determined that for some Agricultural Pool wells it is not practical to repair, replace or install new meters. In these cases, Watermaster applies a water-duty based method to estimate production on an annual basis.

Groundwater-level monitoring. Watermaster's groundwater-level monitoring program supports many Watermaster management functions, including: groundwater model development and recalibration, periodic recalculations of Safe Yield, evaluating the cumulative impacts of transfers and the balance of recharge and discharge, subsidence management, MPI evaluations, estimation of storage change, other scientific demonstrations required for groundwater management, and many regulatory requirements, such as the demonstration of Hydraulic Control, the triennial recomputation of ambient water quality, and Prado Basin habitat sustainability. The monitoring program includes field monitoring programs implemented by Watermaster staff at private wells and monitoring wells, and cooperative programs to compile and store data from well owners and other entities managing monitoring programs, including municipal water agencies, private water companies, the California Department of Toxic Substance Control (DTSC), the County of San Bernardino, and various private consulting firms. To continue to support assessments of Hydraulic Control, and other analyses, it is anticipated that new monitoring wells will need to be constructed to replace the currently monitored private wells that will be lost as land is converted from agricultural uses to urban uses.

Groundwater-quality monitoring. Watermaster's groundwater-quality monitoring program supports many Watermaster management and regulatory-compliance functions, including: compliance with the maximum benefit SNMP, characterization of non-point source contamination and plumes associated with point-source discharges, support for ground-water modeling, characterization of groundwater/surface-water interactions in the Prado Basin area, and characterization of basin-wide trends in groundwater quality as part of the Watermaster's biennial State of the Basin report. The monitoring program includes field monitoring programs implemented by Watermaster staff at private wells and monitoring wells, and cooperative programs to compile and store data from well owners and other entities managing monitoring programs (see examples noted for groundwater-level monitoring). To continue to support the triennial ambient water quality recomputation, and other analyses, it is anticipated that new monitoring wells will need to be constructed to replace the currently monitored private wells that will be lost as land is converted from agricultural uses to urban uses.

Surface-water and climate monitoring. Watermaster's surface-water and climate monitoring program supports many Watermaster management functions, including: groundwater model development and recalibration, periodic recalculations of Safe Yield, evaluating the cumulative impacts of transfers and the balance of recharge and discharge, MPI evaluations, recharge master planning, evaluating Prado Basin habitat sustainability, and evaluating compliance with the SWRCB diversion permits, the maximum benefit SNMP, and the recycled-water recharge permits. Most of the datasets are collected from publicly available sources, including POTW discharge data, USGS stream gaging station data, and precipitation and temperature data measured at public weather stations or downloaded from spatially gridded datasets. Chino Basin stormwater, imported water, and recycled water recharge data are collected by the IEUA and shared with Watermaster. Watermaster staff also performs field surface water monitoring of the Santa Ana River in compliance with the maximum-benefit SNMP.

Ground-level monitoring. Watermaster's ground-level monitoring program is conducted pursuant to the *Chino Basin Subsidence Management Plan*. The ground-level monitoring program consists of high-frequency, groundwater level monitoring at wells, monitoring of the vertical component of aquifer system compression and expansion at Watermaster extensometer facilities, and measurement of horizontal ground-surface deformation across areas that are experiencing differential land subsidence by electronic distance measurements (EDMs) to understand the potential threats and locations of ground fissuring.

Biological monitoring. Watermaster's biological monitoring program is conducted pursuant to the adaptive monitoring program (AMP) for the Prado Basin Habitat Sustainability Program (PBHSP). The objective of the PBHSP is to ensure that the groundwater-dependent ecosystem in Prado Basin will not incur unforeseeable significant adverse impacts due to implementation of the Peace II Agreement. The monitoring program produces a time series of data and information on the extent and quality of the riparian habitat in the Prado Basin over a historical period that includes both pre- and post-Peace II implementation. Two types of monitoring and assessment are performed: regional and site-specific. Regional monitoring and assessment of the riparian habitat is performed by mapping the extent and quality of riparian habitat over time using multi-spectral remote-sensing data and air photos. Site-specific monitoring performed in the Prado Basin includes field vegetation surveys and seasonal ground-based photo monitoring.

Water-supply and water-use monitoring. Watermaster compiles water supply and water-use data from the Parties to support two required reporting efforts: the Watermaster Annual Report to the Court and annual reporting requirements for adjudicated basins pursuant to the Sustainable Groundwater Management Act (SGMA). The data are also used to support calibration of Watermaster's surface water and groundwater models. Monthly water use volumes for supply sources other than Chino Basin groundwater are collected from the Parties; this includes groundwater from other basins, recycled water, imported water, and native surface water.

Planning information. Watermaster periodically collects and compiles information on the Parties' best estimates of their future demands and associated water supply plans. The data are used for future planning investigations that require the use of Watermaster's surface and groundwater models, such as Safe Yield recalculations and RMP updates. These data include:

- Water demands and water-supply plans of the Watermaster Parties:
    1. Projected total water demand
    2. Projected amount of each water supply by source to meet the projected water demand
    3. Monthly distribution of water supplies used to meet the demand
    4. Projected groundwater pumping at each existing well and future planned wells
    5. Groundwater pumping schedules (i.e. well use priorities and capacities)
    6. Pumping capacities, required pumping combinations, and sustainable pumping levels (pumping sustainability metric) at each well
- Assumptions for how:
    1. Managed storage will be used to meet Replenishment Obligations
    2. Lands currently in agricultural uses will be converted to urban uses
    3. Additional potential conservation above that currently required for new land development
- Future projections of location and magnitude of stormwater and supplemental water recharge

Well construction, abandonment, and destruction. Watermaster maintains a database on wells in the basin and performs periodic well inspections. Sometimes, Watermaster staff identifies a new well while implementing its monitoring programs. Well owners must obtain permits from the appropriate county and state agencies to drill a well and to put the well in use. Watermaster has developed cooperative agreements with the State Water Board's Division of Drinking Water (DDW) and the Counties of Los Angeles, Orange, Riverside, and San Bernardino to ensure that the appropriate entities know that a new well has been constructed. Watermaster staff makes best efforts to obtain well design information, lithologic and geophysical logs, groundwater level and quality data, and aquifer stress test data.

The presence of abandoned wells is a threat to groundwater supply and a physical hazard. Watermaster staff periodically reviews its database, makes appropriate inspections, consults with well owners, maintains a list of abandoned wells in the Chino Basin, and provides this list to the counties for follow-up and enforcement. The owners of the abandoned wells are requested to properly destroy their wells following the ordinances developed by the county in which they are located.

3.2.2 Program Element 2. Develop and Implement Comprehensive Recharge Program

The 2000 OBMP included PE 2–*Develop and Implement Comprehensive Recharge Program*—to reverse the loss of yield caused by urbanization and the concrete lining of natural streams overlying the Chino Basin. PE 2 is also meant to ensure that there will be enough supplemental water recharge capacity available to Watermaster to meet Replenishment Obligations.

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 3 below. Each implementation action in Table 3 is categorized as a one-time or ongoing action, and the right-most column of the table indicates if the action was implemented.

Table 3. Program Element 2 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 1 through 3		
Watermaster advisory committee will form an ad-hoc committee to coordinate with CBWCD and SBCFCD.	One-time	✓
Implement all high priority recharge projects that involve only re-operation of existing recharge/flood control facilities.	One-time	✓
Complete the RMP.	One-time	✓
Complete design and construction of early action recharge projects identified in the first year of the implementation of the OBMP.	One-time	✓
Years 4 through 50		
By year 5 implement all high priority projects that involve construction and re-operation at existing facilities.	One-time	✓
Implement all other recharge projects based on need and available resources.	Ongoing	✓
Update the comprehensive recharge program every five years.	Ongoing	✓

3.2.2.1 Implementation Progress since 2000

The scope of work defined under PE 2 was to continue the recharge master plan study initiated by Watermaster and the Chino Basin Water Conservation District (CBWCD) in 1998. The implementation plan for PE 2 includes the preparation of a recharge master plan update (RMPU) at least every five years. The objectives and scope of each RMPU are defined at the beginning of each update and are derived from several guiding documents: the Peace Agreement, the Peace II Agreement, and the Special Referee's December 2007 Report. Pursuant to these guiding documents, the general objectives of the RMPU are to ensure there is enough recharge capacity and supplemental water available to meet future replenishment requirements, to balance the recharge and discharge in every area and subarea, to maximize the recharge of recycled and storm waters where feasible, and to protect or enhance Safe Yield. To meet these objectives, the RMPUs must consider and address recharge requirement projections, the availability of storm and supplemental waters for recharge and replenishment, and the physical means to satisfy these recharge projections. To the extent that new or modified facilities are required to meet the objectives, the RMPUs include a schedule for the planning, design, and construction of recharge improvements. The 2001 Recharge Master Plan and subsequent RMPUs (2010, 2013, and 2018) were developed in open and transparent planning processes that were convened by Watermaster through an ad-hoc committee. As part of the *2013 Amendment to the 2010 RMPU* (2013 RMPU), the RMPU Steering Committee, now referred to as the Recharge Investigations and Projects Committee (RIPComm), was created to assist Watermaster and the IEUA in preparing RMPUs. The RIPComm is open to all interested stakeholders and meets regularly through the development of RMPUs. The outcomes of the 2001 Recharge Master Plan and subsequent RMPUs (2010, 2013, and 2018) are summarized below:

- 2001 Recharge Master Plan: Watermaster, in collaboration with the IEUA, constructed the first set of recharge facilities to exercise its rights pursuant to its diversion permits, increasing average annual stormwater recharge by about 9,500 afy. As part of this work, Watermaster and the IEUA modified seventeen existing flood retention facilities to increase diversion rates, conservation storage, and recharge, and constructed two new recharge facilities. The cost of these recharge improvements was about $60 million. The IEUA and Watermaster paid for about half of this cost, while the other half was funded through Proposition 13 grants and other grant programs.
- 2010 RMPU and 2013 Update: As of this writing, Watermaster and the IEUA are completing the final design/construction of five of the recommended 2013 RMPU facilities, and they should be online in 2021. These facilities are expected to increase stormwater recharge by about 4,700 afy.
- 2018 RMPU: The 2018 RMPU did not recommend any new recharge projects. One of the findings of the 2018 recharge master plan update was that Watermaster has enough supplemental water recharge capacity to it meet its Replenishment Obligations via wet-water recharge through 2050.

Upon completion of the 2013 RMPU facilities, the annual average stormwater recharge performed pursuant its diversion permits is expected to be about 14,950 afy.[15] Thus, in the first 20 years of OBMP

[15] WEI (2018). Recharge Master Plan Update. September 2018.
http://www.cbwm.org/docs/engdocs/2018%20RMPU/20180914_2018_RMPU_final.pdf

implementation, stormwater recharge will have increased by about 14,150 afy, and supplemental water recharge capacity will have increased by 27,600 afy. And, the IEUA has increased the recharge of recycled water from about 500 afy in 2000 to about 16,000 afy in 2018. The next RMPU must be completed and submitted to the Court by October 2023.

3.2.2.2 Ongoing implementation actions for the 2020 OBMP

The RMPU process is an ongoing requirement of the 2000 OBMP Implementation Plan. The next RMPU is due to the Court by October 2023 and must be updated no less frequently than every five years thereafter. As identified in Activity A, the Parties have expressed interest in maximizing the recharge of recycled, imported, and storm waters where feasible. Although meeting these objectives is not a requirement for the RMPU, the next (or a future) RMP process could accomplish the objectives of Activity A by considering projects that will meet other needs of the Parties, such as providing additional recharge capacity for Storage and Recovery Programs or addressing pumping sustainability issues. As summarized below and described in further detail in the Scoping Report, there are opportunities and challenges for increasing these efforts in the future:

- The theoretical average annual stormwater discharge available for diversion under the existing water rights permits is about 74,000 afy (ranging from 21,400 to 110,500 afy for the combined permitted diversions) and the annual average stormwater recharge performed pursuant to these permits is expected to be about 14,950 afy. The difference between these two values, about 60,000 afy, is a lost opportunity for stormwater recharge. Improvements to existing facilities and operations and/or new facilities are required to achieve the stormwater recharge potential.

- New recharge facilities and/or improvements to existing facilities may be needed if Parties want to increase supplemental water recharge.

- Based on Watermaster and the IEUA's existing economic selection criteria (projects are selected for implementation only if the melded unit cost of stormwater recharge resulting from the projects is less than the avoided unit cost of purchasing imported water from the Metropolitan Water District of Southern California [Metropolitan]), no new recharge projects were recommended for implementation in the 2018 RMPU. If the Parties desire to develop a list of projects that will increase recharge in the basin, the economic criteria for selecting projects needs to be reevaluated.

- Finally, the criteria on how and where to conduct recharge needs to be updated to more effectively address existing basin management issues, including: land subsidence, maintaining Hydraulic Control, and pumping sustainability. Historically, Watermaster has attempted to manage the recharge of storm and supplemental water to promote the balance of recharge and discharge. This method of managing recharge does not specifically address current basin management issues, such as existing land subsidence in Management Zone 1 (MZ-1) and parts of MZ-2 and pumping sustainability issues in the Jurupa Community Services District (JCSD) and CDA well fields. There is a need to define additional criteria on how and where to conduct recharge to better address existing basin management issues.

Thus, during the scoping phase of the next RMPU, the Parties should determine if the economic and physical criteria for project evaluation should be revaluated to accomplish Activity A.

Section 4.2 of this report summarizes the 2020 OBMP Management Plan for PE 2.

3.2.3 Program Element 3. Develop and Implement a Water Supply Plan for Impaired Areas

The 2000 OBMP included PE 3—*Develop and Implement a Water Supply Plan for Impaired Areas*—to maintain and enhance Safe Yield and maximize beneficial uses of groundwater. The OBMP recognized that urban land uses would ultimately replace agricultural land uses, which had been the primary land use in the southern portion of the basin throughout the 20th century, and that if municipal pumping did not replace agricultural pumping, groundwater levels would rise and discharge to the Santa Ana River. The potential consequences would be the loss of Safe Yield and the outflow of high-TDS and -nitrate groundwater from the Chino Basin to the Santa Ana River—the latter of which could impair downstream beneficial uses in Orange County. The OBMP estimated that to maintain the Safe Yield, approximately 40,000 afy of groundwater would need to be produced to replace Agricultural Pool pumping in the southern part of the basin. The Chino Basin Desalters were identified as the optimal multi-benefit project to replace the expected decrease in agricultural production to maintain or enhance Safe Yield, to pump and treat high-salinity groundwater in support of PE 7, to meet growing municipal demands in support of PE 5, and to protect the beneficial uses of the Santa Ana River. Additionally, PE 6 envisioned that the Chino Basin Desalters could also be used to clean up the volatile organic compound (VOC) plumes that would eventually be intercepted by the Desalter wells.

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 4 below. Each implementation action in Table 4 is categorized as a one-time or ongoing action, and the right-most column of the table indicates if the action was implemented.

Table 4. Program Element 3 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 1 through 3		
Complete the Water Facilities Plan Report for the Expansion of the Chino I Desalter and the construction of the Chino II Desalter. It should be noted that this action is entirely consistent with the OBMP, and is being taken prior to completion of the OBMP.	One-time	✓
Start expansion of the Chino I Desalter and the construction of the Chino II Desalter in early 2001.	One-time	✓
Years 4 through 50		
Complete construction and start up of the expanded Chino I and new Chino II Desalters.	One-time	✓
Watermaster, IEUA and WMWD will periodically review the Regional Water Supply Plan and the need for new Desalter capacity in the southern water-quality impaired part of the Basin, and initiate the construction of new Desalter capacity as determined by Watermaster. Expansion of the Desalter capacity will occur as agricultural production in the southern water-quality impaired part of the basin declines.	Ongoing	✓

3.2.3.1 Implementation Progress since 2000

The OBMP established that desalter production would ultimately need to be increased to 40,000 afy to protect Safe Yield. The Peace Agreement provided for the expansion of the Chino I Desalter to a design capacity of up to 14 mgd (15,700 afy) and the construction of the Chino II Desalter, with a capacity of 10 mgd. The Parties executed the Peace II Agreement in 2007, which included a supplement to the OBMP Implementation Plan to expand the Chino Desalter pumping to 40,000 afy (36 mgd) and introduce Re-operation.

The construction and operation of the Chino Basin Desalters also became a fundamental component of the Chino Basin maximum-benefit SNMP developed pursuant to PE 7.[16] Watermaster and the IEUA are jointly responsible for the implementation of the maximum benefit SNMP, which enables the recycled-water reuse and recharge programs in the Chino Basin in support of PEs 2 and 5. The SNMP includes nine “maximum-benefit commitments.” One commitment is the achievement and attainment of Hydraulic Control to limit groundwater outflow from the Chino-North Groundwater Management Zone (GMZ) to *de minimis* levels to protect downstream beneficial uses. Hydraulic Control is also necessary to maximize the Safe Yield. The operation of the Chino Basin Desalters is necessary to attain Hydraulic Control. Three of the nine maximum-benefit commitments are related to the design and construction of the Chino Basin Desalters.

As of the writing of this report, there are 31 Chino Desalter wells with the capacity to pump about 34 mgd (37,600 afy) of groundwater from the southern portion of the Chino Basin, though not all wells are currently in operation. Pumped groundwater is conveyed to two treatment facilities (the Chino-I and Chino-II Desalters) that treat the groundwater with reverse osmosis and ion exchange to reduce TDS and nitrate concentrations. The treated water is then delivered to a conveyance system that serves the CDA’s member agencies. The brine created in the treatment process is discharged to the Inland Empire Brine Line. Over the last five years, total desalter production has ranged from about 28,100 to 30,000 afy, averaging 29,200 afy. The following describes the history of the expansion of the Chino Basin Desalters:

- The Chino-I Desalter, which included 11 production wells, began operating in 2000 with a design capacity of 8 million gallons per day (mgd; about 9,000 afy).
- In 2005, the Chino-I Desalter capacity was expanded to 14 mgd (about 16,000 afy) with the construction of three additional wells.
- The Chino-II Desalter, which included eight production wells, began operating in June 2006 with a design capacity of 15 mgd (about 17,000 afy).
- In 2012, the CDA completed construction of the Chino Creek Well Field (CCWF) in the western portion of the basin which added five wells and additional capacity of about 1.3 mgd (1,500 afy) to the Chino-I Desalter; four of these wells began pumping between 2014 and 2016.
- In 2015, two additional Chino-II Desalter wells were constructed, and pumping began in 2018. These two wells, plus one additional well that is planned for construction, are part of the final expansion of the Chino Basin Desalters to meet the 40,000 afy pumping requirement of the OBMP, Peace Agreements, and maximum benefit SNMP. This final expansion is expected to be completed by 2021.

[16] Refer to Section 3.2.7 of this report for a complete overview of the maximum-benefit SNMP.

The Chino Basin Desalters are also being used to support the clean-up of point-source contamination in the southern Chino Basin:

- Two of the Chino-II Desalter expansion wells and CDA Well I-11 will be pumped to capture groundwater contaminants from the South Archibald plume. The Chino-II Desalter, which will be modified to treat the volatile organic compounds (VOCs) associated with the plume (see Section 3.2.6).
- The use of two of the CCWF wells is being evaluated for use as part of the remediation solution for the Chino Airport plume; however, the evaluation of the remediation alternatives is ongoing (see Section 3.2.6).

3.2.3.2 Ongoing implementation actions for the 2020 OBMP

The capacity to pump the Chino Basin Desalter goal of 40,000 afy is expected to be achieved by 2021. Operation at this capacity, once all agricultural land uses have converted to urban uses, would fulfill the objectives of PE 3. As previously noted, the operation of the Chino Basin Desalters is necessary to attain Hydraulic Control, which is a regulatory requirement of the maximum benefit SNMP. Thus, the ongoing implementation actions for the 2020 OBMP related to the operation of the Chino Basin Desalters are included under PE 7 (see Sections 3.2.7 and 4.7).

3.2.4 Program Element 4. Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1

The 2000 OBMP included PE 4—*Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1*—to characterize land subsidence spatially and temporarily, identify its causes, and, where appropriate, develop and implement a program to manage it. The 2000 OBMP identified pumping-induced decline of groundwater levels and subsequent aquifer-system compaction as the most likely cause of the land subsidence and ground fissuring observed in the southwestern portion of MZ-1 in the early 1990s. PE 4 recognized that the occurrence of land subsidence and ground fissuring in MZ-1 is not acceptable and should be reduced to tolerable levels or stopped.

PE 4 called for the development and implementation of an interim management plan for MZ-1 that would: minimize subsidence and fissuring in the short-term, collect the information necessary to understand the extent, rate, and mechanisms of subsidence and fissuring, and formulate a long-term management plan to prevent future subsidence and fissuring or reduce it to tolerable levels.

The implementation actions for PE 4 that were incorporated into the 2000 OBMP Implementation Plan are summarized in Table 5 below. Each implementation action in Table 5 is categorized as a one-time or ongoing action and the right-most column of the table indicates if the action was implemented.

Table 5. Program Element 4 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 1 through 5		
Arrange for the physical recharge of 6,500 afy of Supplemental Water at MZ1 spreading facilities. Evaluate for the continued need after FY2004-05.	Ongoing	✓
Convene a MZ1 technical committee to develop a recommended interim management plan to minimize subsidence while data is collected and a long-term subsidence management plan is developed.	One time	✓
Implement the interim management plan, including appropriate monitoring, annual assessment of data from monitoring programs, and modification of monitoring programs, if necessary.	One time	✓
Develop a long-term subsidence management plan.	One time	✓
Implement the long-term subsidence management plan and adapt if necessary.	Ongoing	✓
Years 6 through 50		
Assess data from the monitoring program every three years and modify the subsidence management plan, if necessary.	Ongoing	✓
Implement the long-term subsidence management plan and adapt if necessary.	Ongoing	✓

3.2.4.1 Implementation Progress since 2000

Supplemental Water Recharge

Since the development of the OBMP, Watermaster has exercised best efforts to arrange for the physical recharge of 6,500 afy of supplemental water at the MZ-1 spreading facilities. And, pursuant to the Peace II Agreement, Watermaster committed to continue the physical recharge of at least 6,500 afy of supplemental water as an annual average through the term of the Peace Agreement.

Subsidence Management Plan

From 2001 to 2005, Watermaster developed, coordinated, and conducted the *MZ-1 Interim Monitoring Program* (IMP)[17] under the guidance of the MZ-1 Technical Committee. The MZ-1 Technical Committee was comprised of representatives from all major MZ-1 producers and their technical consultants, including the Agricultural Pool; the Cities of Chino, Chino Hills, Ontario, Pomona, and Upland; the Monte Vista Water District; the Golden State Water Company; and the California Institution for Men (CIM).

The IMP consisted of three main monitoring elements for use in analyzing subsidence: ground-level surveys, remote-sensing (InSAR), and aquifer-system monitoring. The ground-level surveys and InSAR

[17] Chino Basin Watermaster. (2003). *Optimum Basin Management Program, Management Zone 1 Interim Monitoring Program*. Prepared by Wildermuth Environmental, Inc. January 8, 2003.

analyses were used to characterize vertical ground motion. Aquifer-system monitoring of hydraulic and mechanical changes within the aquifer-system was used to characterize the causes of aquifer-system deformation.

The IMP was implemented in two phases: the Reconnaissance Phase and the Comprehensive Phase.

1. The Reconnaissance Phase consisted of constructing 11 piezometers screened at various depths at Rubin S. Ayala Park (Ayala Park) in the City of Chino and installing pressure transducer data-loggers in nearby pumping wells and monitoring wells to measure hydraulic head. Following installation of the monitoring network, several months of aquifer-system monitoring and testing were conducted. Testing included aquifer-system stress tests at pumping wells in the area.
2. The Comprehensive Phase consisted of constructing a dual-borehole pipe extensometer at Ayala Park (Ayala Park Extensometer), near the area of historical fissuring. Following installation of the Ayala Park Extensometer, two aquifer-system stress tests were conducted, followed by passive aquifer-system monitoring.

The IMP provided enough information for Watermaster to develop "Guidance Criteria" for the MZ-1 Parties that, if followed, would minimize the potential for subsidence and fissuring in the investigation area. The methods, results, and conclusions of the IMP, including the Guidance Criteria, were described in detail in the *MZ-1 Summary Report*.[18] The Guidance Criteria formed the basis for the long-term management plan, documented as the *MZ-1 Subsidence Management Plan* (MZ-1 Plan),[19] which was prepared under the guidance of the MZ-1 Technical Committee. To minimize the potential for future subsidence and fissuring in the Managed Area, the MZ-1 Plan recommended that the MZ-1 Parties manage their groundwater pumping pursuant to the Guidance Criteria. The MZ-1 Plan was approved by the Watermaster Board in October 2007 and the Court in November 2007.

Implementation of the MZ-1 Plan began in 2008. The MZ-1 Plan called for the continuation of monitoring, data analysis, annual reporting, and adjustments to the MZ-1 Plan, as warranted by the data. Additionally, the MZ-1 Plan expanded monitoring of the aquifer-system and land subsidence into other areas of the Chino Basin where the IMP indicated concerns for future subsidence and ground fissuring. These so-called "Areas of Subsidence Concern" are: Central MZ-1, Northwest MZ-1, Northeast Area, and Southeast Area.

The MZ-1 Plan described the following potential expanded investigation: (1) more intensive monitoring of horizontal strain across the zone of historical ground fissuring to assist in developing management strategies related to fissuring, (2) injection feasibility studies within the Managed Area, (3) additional pumping tests to refine the Guidance Criteria, (4) computer-simulation modeling of groundwater flow and subsidence, and (5) the development of alternative pumping plans for the MZ-1 Parties affected by the MZ-1 Plan. The MZ-1 Technical Committee (now called the Ground-Level Monitoring Committee or GLMC) discussed these potential future efforts, and if deemed prudent and necessary, they were

[18] Chino Basin Watermaster. (2006). *Optimum Basin Management Program, Management Zone 1 Interim Monitoring Program, MZ-1 Summary Report*. Prepared by Wildermuth Environmental, Inc. February 2006. http://www.cbwm.org/docs/engdocs/Land%20Subsidence/20071017_MZ1_Plan%20--%20Appendix_A_MZ1_SummaryReport_20060226.pdf

[19] Chino Basin Watermaster. (2007). *Chino Basin Optimum Basin Management Program, Management Zone 1 Subsidence Management Plan*. October 2007. http://www.cbwm.org/docs/engdocs/Land%20Subsidence/20071017_MZ1_Plan.pdf

recommended to Watermaster for implementation. Watermaster and the MZ-1 Parties have performed work to implement (1), (2), and (4) above, but have not performed work on (3) and (5).

The MZ-1 Plan stated that if data from existing monitoring efforts in the Areas of Subsidence Concern indicate the potential for adverse impacts due to subsidence, Watermaster would revise the plan to avoid those adverse impacts. The 2014 Annual Report of the GLMC[20] recommended that the MZ-1 Plan be updated to better describe Watermaster's land subsidence efforts and obligations, including areas outside of MZ-1. As such, the update included a name change to the *2015 Chino Basin Subsidence Management Plan* (Subsidence Management Plan)[21] and a recommendation to develop a subsidence management plan for Northwest MZ-1. Land subsidence in Northwest MZ-1 was first identified as a concern in 2006 in the MZ-1 Summary Report and again in 2007 in the MZ-1 Plan. Since then, Watermaster has been monitoring vertical ground motion in this area via InSAR and groundwater levels with pressure transducers at selected wells.

Of particular concern is that subsidence across the San Jose Fault in Northwest MZ-1 has occurred in a pattern of concentrated differential subsidence—the same pattern of differential subsidence that occurred in the Managed Area during the time of ground fissuring. Ground fissuring is the main subsidence-related threat to infrastructure. Because of the threat for ground fissuring, Watermaster increased monitoring efforts in Northwest MZ-1 beginning in FY 2012/13 to include ground elevation surveys and EDMs to monitor ground motion and the potential for fissuring.

In 2015, the GLMC developed the *Work Plan to Develop a Subsidence Management Plan for the Northwest MZ-1 Area* (Work Plan).[22] The Work Plan is an ongoing Watermaster effort and includes a description of a multi-year scope-of-work, a cost estimate, and an implementation schedule. The Work Plan was included in the Subsidence Management Plan as Appendix B. Implementation of the Work Plan began in 2015.

Pursuant to the Subsidence Management Plan, each year, Watermaster has produced the *Annual Report of the GLMC* that contains the results of ongoing monitoring efforts, interpretations of the data, and recommended adjustments to the Subsidence Management Plan, if any. The annual report includes the results and interpretations for the data collected during the prior year as well as recommendations for Watermaster's ground-level monitoring program for the subsequent fiscal year. The Watermaster publishes the annual reports on its website. The most recent annual report was finalized in October 2019.

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[20] WEI. (2015). *2014 Annual Report of the Ground-Level Monitoring Committee*. July 2015. http://www.cbwm.org/docs/engdocs/2014%20Final%20Report%20-%20Ground%20Level%20Monitoring%20Committee/Final_2014_Annual%20Report_July2015.pdf

[21] Chino Basin Watermaster. (2015). *Chino Basin Subsidence Management Plan.* July 23, 2015. http://www.cbwm.org/docs/engdocs/Land%20Subsidence/20150724%20-%20Chino%20Basin%20Subsidence%20Management%20Plan%202015/FINAL_2015_CBSMP.pdf

[22] Chino Basin Watermaster. (2015). *Work Plan, Develop a Subsidence-Management Plan for the Northwest MZ-1 Area.* July 23, 2015. http://www.cbwm.org/docs/engdocs/Land%20Subsidence/20150724%20-%20Chino%20Basin%20Subsidence%20Management%20Plan%202015/FINAL_CBSMP_Appendix_B.pdf

3.2.4.2 Ongoing implementation actions for the 2020 OBMP

Supplemental Water Recharge

Pursuant to the Peace II Agreement, Watermaster will continue to arrange for the physical recharge of at least 6,500 afy of Supplemental Water in MZ-1 as an annual average through the term of the Peace Agreement.

Subsidence Management Plan

The Chino Basin will always be susceptible to the future occurrence of land subsidence and ground fissuring, so Watermaster will continue to implement the Subsidence Management Plan pursuant to PE 4, which includes:

- Conducting the ground-level monitoring program pursuant to the Subsidence Management Plan and the recommendations of the GLMC (The monitoring program includes the monitoring of groundwater pumping, recharge, groundwater levels, aquifer-system deformation, and vertical and horizontal ground motion across the western portion of the Chino Basin. The then-current description of the ground-level monitoring program is always included in each Annual Report of the GLMC [third bullet below]).
- Convening the GLMC annually to review and interpret the data from the ground-level monitoring program.
- Preparing annual reports of the GLMC that include recommendations for changes to the monitoring program (The annual report describes recommended activities for the monitoring program for the future fiscal year[s] in the form of a proposed scope-of-work, schedule, and budget. The recommended scope-of-work, schedule, and budget is run through Watermaster's budgeting process for revisions [if needed] and approval. The final scope-of-work, schedule, and budget for the upcoming fiscal year is included in the final annual report.)
- A key element of the Subsidence Management Plan is the verification of its protective nature against land subsidence and ground fissuring in the Chino Basin. This verification is accomplished through continued monitoring, testing, and reporting by the GLMC (as described above), and revision of the Subsidence Management Plan when appropriate. In this sense, the Subsidence Management Plan is adaptive. (The process of annual data analysis and reporting includes the evaluation of the effectiveness of the Subsidence Management Plan to minimize or stop land subsidence and ground fissuring and, if warranted by the data, a recommendation to update the Subsidence Management Plan. The GLMC will make these recommendations within its annual reports and prepare a draft revised Subsidence Management Plan that will be run through the Watermaster process for revisions and/or approval. Upon Watermaster Board approval, the revised Subsidence Management Plan will be submitted to the Court.)

3.2.5 Program Element 5. Develop and Implement Regional Supplemental Water Program

The 2000 OBMP included PE 5—*Develop and Implement Regional Supplemental Water Program*—to improve regional conveyance and the availability of imported and recycled waters throughout the basin. The OBMP recognized that water demands of the Parties would increase. The demand projections at the time estimated that water demands would reach 348,000 afy by 2000 and increase to 418,000 afy by 2020. The increase was assumed to be driven by municipal and industrial demands. Agriculture demands were expected to decrease from about 48,000 afy in 2000 to 8,000 afy by 2020. The OBMP also recognized the limitations to the traditional supplies, such as imported water from Metropolitan, and the need to find alternative supplies such as recycled water.

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 6 below. Each implementation action in Table 6 is categorized as a one-time or ongoing action and the right-most column of the table indicates if the action was implemented.

Table 6. Program Element 5 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 4 through 50		
IEUA will construct recycled water facilities to meet the demand for recycled water and for replenishment.	Ongoing	✓

It should be noted that early in the development of the PE 5 implementation plan, the stakeholders discussed the development of a regional water facilities plan that, when implemented, would enable the Parties to maximize the use of imported water in years when Metropolitan has surplus water and to be able to rely completely on local supplies during years when Metropolitan supplies are low or completely interrupted due to planned or catastrophic outages. This plan involved the construction of new wells and groundwater treatment and regional conveyance improvements; the water produced in this plan would be used exclusively by the Parties. The stakeholders ultimately did not include this plan in the 2000 OBMP Implementation Plan, preferring at that time to focus on expanding groundwater desalting in the lower Chino Basin (PE 3), increasing stormwater recharge (PE 2), and implementing a large-scale recycled water program to maximize its reuse (PEs 2 and 5).

3.2.5.1 Implementation Progress since 2000

Although the water demands of the Parties increased at a slower rate than projected when the OBMP was developed, Watermaster and the IEUA have aggressively pursued programs to improve water supply reliability through the implementation of PEs 2, 3, and 5. Since 2000, the IEUA has constructed and operated a recycled water conveyance system throughout the basin, enabling it to provide recycled water to its member agencies. The IEUA owns and operates four wastewater treatment facilities: Regional Plant No. 1 (RP-1), Regional Plant No. 4 (RP-4), Regional Plant No. 5 (RP-5), and the Carbon Canyon Water Reclamation Facility (CCWRF). Recycled water produced by these plants is used for direct uses, groundwater recharge, and discharged to Chino Creek or Cucamonga Creek, which are tributaries to the Santa Ana River. Historically, the IEUA's operating plan has prioritized the use of recycled water as follows: (1) to meet the IEUA's discharge obligation to the Santa Ana River (17,000 afy), (2) to meet direct reuse demands for recycled water, and (3) to recharge the remaining recycled water.

Although recycled water had been reused since the 1970s, the growth of the IEUA's recycled water reuse programs started in 1997, and in 2005 the OBMP enabled the IEUA's recycled water reuse program to be aggressively expanded. When the OBMP was completed in 2000, the IEUA was recharging about 500 afy of recycled water and utilizing about 3,200 afy for non-potable direct uses. The incorporation of Watermaster and the IEUA's maximum benefit SNMP into the Basin Plan in 2004 triggered the ability to rapidly increase recycled water reuse. Over the last five years, the annual direct reuse of recycled water ranged from 17,000 afy to 24,600 afy and averaged 20,600 afy. And, the annual recycled water recharge ranged from 10,800 to 13,900 afy and averaged 13,000 afy.

The recycled water provided by the IEUA has replaced a like amount of groundwater and imported water that would have otherwise been used for non-potable purposes. Much of the post-2000 increase in supplemental water storage in the Chino Basin is attributable to the increased availability and recharge of recycled water.

3.2.5.2 Ongoing implementation actions for the 2020 OBMP

Recycled Water Reuse

The IEUA is continuing to expand its recycled-water distribution system and recharge facilities throughout the Chino Basin for direct non-potable uses and recharge. Growth is still occurring in the Chino Basin and will result in additional wastewater flows to the IEUA's treatment plants. Much of this supply will be used to meet increasing non-potable demands as the currently remaining agricultural land uses convert to urban uses.

The IEUA is currently performing planning efforts for the CBP, which is a large Storage and Recovery Program to provide for regional, dry-year water supplies and associated infrastructure. The CBP was conditionally awarded approximately $207 million of Proposition 1 Water Storage Investment Program funding. Over its 25-year project life, the CBP would increase recycled water recharge in the Chino Basin by 15,000 afy, and during dry years, the water in storage would subsequently be recovered and pumped into Metropolitan's system for use in Southern California in lieu of imported water from the State Water Project. The planned sources of recycled water for the CBP are currently being evaluated by the IEUA, but it is certain additional supplies beyond those produced by the IEUA will be needed. Thus, the objective to maximize the reuse of recycled water produced by the IEUA and others as envisioned by Activity D is currently being pursued by the IEUA on behalf of the Parties and with the support of Watermaster and other regional entities.

As part of the CBP, the IEUA, together with regional agencies, is developing a significant body of work to evaluate opportunities to acquire the surplus recycled water supplies needed for the CBP. The CBP is still undergoing planning and evaluation, and its implementation is not certain. If the CBP is not implemented, the significant body of work developed by the IEUA can be leveraged to support future planning efforts to maximize recycled water reuse in a manner that is consistent with the Judgment and the maximum-benefit SNMP.

Water Reliability

In addition to the efforts to maximize recycled water reuse, the IEUA and its member agencies are currently preparing the 2020 IRP, which will serve as a regional implementation strategy for long-term water resources management within the IEUA's service area. The objective of the IRP is to identify the facilities needed to ensure that the IEUA's water supplies over the next 25 years are reliable, cost-effective, and environmentally responsible.

As described in the Scoping Report, the total water demand of the Chino Basin Parties is projected to grow from about 290,000 afy in 2015 to about 420,000 afy by 2040, an increase of about 130,000 afy. The projected growth in water demand by the Appropriative Pool Parties drives the increase in aggregate water demand as some Appropriative Pool Parties are projected to serve new urban water demands created by the conversion of agricultural and vacant land uses to urban uses, a similar challenge observed during the development of PEs 3 and 5 in the 2000 OBMP. Table 7 below shows the historical (2015) and projected aggregate water demand and supply plan for all Parties by water source.

Table 7. Aggregate Water Supply Plan for Watermaster Parties: 2015 to 2040[23]

Water Source	2015 (Actual)	2020	2025	2030	2035	2040
Volume (af)						
Chino Basin Groundwater	147,238	145,904	153,804	157,716	168,987	176,652
Non-Chino Basin Groundwater	51,398	55,755	63,441	64,999	66,691	68,483
Local Surface Water	8,108	15,932	15,932	18,953	18,953	18,953
Imported Water from Metropolitan	53,784	86,524	93,738	100,196	102,166	109,492
Other Imported Water	8,861	9,484	10,095	10,975	11,000	11,000
Recycled Water for Direct Reuse	20,903	24,008	24,285	26,583	29,836	33,223
Total	**290,292**	**337,607**	**361,295**	**379,422**	**397,633**	**417,803**
Percentage						
Chino Basin Groundwater	51%	43%	43%	42%	42%	42%
Non-Chino Basin Groundwater	18%	17%	18%	17%	17%	16%
Local Surface Water	3%	5%	4%	5%	5%	5%
Imported Water from Metropolitan	19%	26%	26%	26%	26%	26%
Other Imported Water	3%	3%	3%	3%	3%	3%
Recycled Water for Direct Reuse	7%	7%	7%	7%	8%	8%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Each of the water sources available to the Chino Basin Parties listed has its limitations:

- The ability to produce groundwater from the Chino Basin is limited by current basin management issues, such as ongoing land subsidence in MZ-1 and parts of MZ-2, pumping sustainability issues in the JCSD and CDA well field areas, and water quality.
- The challenges to imported water include reliability of its supply and infrastructure and the local capacity to treat it for municipal supply.
- The reliability of non-Chino Basin groundwater depends on water quality, water rights, and infrastructure to convey it to Parties' water systems.
- The reliability of local surface water depends on the hydrologic characteristics of the individual supplies, water quality, water rights, and infrastructure to convey it from points of diversion to a Party's water system.
- The challenges to maximizing the reuse of recycled water include: the timing of recycled water availability and complying with the maximum benefit SNMP and water quality regulations.

[23] Sourced from: WEI. (2018). *Storage Framework Investigation*. October 2018; revised January 2019. This document is available on Watermaster's FTP site at http://www.cbwm.org/

In addition to the challenges to specific water sources, climate change is likely to result in higher temperatures, longer dry periods, and shorter more intense wet periods, which can ultimately affect the availability and management of all water supply sources. For example, shorter more intense precipitation periods are expected to result in reduced recharge, and longer dry periods are expected to result in reduced imported water supplies (as occurred with State Water Project supplies in the recent drought from 2013 to 2016). And, many of the challenges are interrelated and compounding. For example, the reliability of imported water (and other non-groundwater supplies) not only affects the imported water supply but also the groundwater supplies that are dependent on imported water for blending.

As previously mentioned, the IEUA is currently developing the 2020 IRP, which will serve as a foundational regional implementation strategy for long-term water resources management within IEUA's service area and can be expanded by the Chino Basin Parties for the benefit of the region. Although the TVMWD and WMWD member agencies and Watermaster are participants in the development in the 2020 IRP, the current planning effort could be expanded to address regional reliability and to enhance integration with Watermaster's groundwater management efforts.

3.2.6 Program Element 6. Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management

The 2000 OBMP included PE 6—*Develop and Implement Cooperative Programs with the Regional Board and other Agencies to Improve Basin Management*—to assess water quality trends in the basin, to evaluate the impact of OBMP implementation on water quality, to determine whether point and non-point contamination sources are being addressed by water quality regulators, and to collaborate with water quality regulators to identify and facilitate the cleanup of soil and groundwater contamination.

The implementation actions for PE 6 incorporated into the 2000 OBMP Implementation Plan are summarized in Table 8 below. Each implementation action in Table 8 is categorized as a one-time or ongoing action and the right-most column of the table indicates if the action was implemented.

Table 8. Program Element 6 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 1 through 3		
Watermaster will form an ad hoc committee, hereafter water quality committee. The schedule and frequency of the meeting will be developed with the Regional Board during the first year of OBMP implementation.	Both	✓
Watermaster will refine its monitoring efforts to support the detection and quantification of water quality anomalies. This may require additional budgeting for analytical staff/support.	One-time	✓
If necessary, Watermaster will conduct investigation to assist the Regional Board in accomplishing mutually beneficial objectives.	Ongoing	✓
Watermaster will seek funding from outside sources to accelerate detection and cleanup efforts.	Ongoing	✓

Implementation Action	One-time/ Ongoing	Implemented?
Years 4 through 50		
Continue monitoring coordination efforts with the Regional Board.	Ongoing	✓
Annually update priority list and schedule for cleaning up known water quality anomalies.	Ongoing	
Continue to seek funding from outside sources to accelerate cleanup efforts.	Ongoing	✓
Implement projects of mutual interest.	Ongoing	✓

3.2.6.1 Implementation Progress since 2000

During the development of the OBMP, Watermaster was conducting a multi-year comprehensive basin-wide water quality monitoring program (from 1999-2001) to sample every well possible to support the development and implementation of the OBMP. The comprehensive water quality monitoring program included collecting data from all Appropriators and cooperators in the Chino Basin and adjacent basins and performing monitoring at all private wells in the southern portion of the basin. During this time, Watermaster performed monitoring at 602 private wells. Data from this comprehensive water quality monitoring program established a baseline on the state of groundwater quality at the start of OBMP implementation. These data also became the foundation for achieving the objectives of PE 6: to assess water quality trends in the basin, to evaluate the impact of OBMP implementation on water quality, and to determine whether point and non-point contamination sources are being addressed by water quality regulators. Since 2000, Watermaster's groundwater quality monitoring efforts have continued in alignment with the Groundwater Quality Monitoring Program described in PE 1 and have been periodically refined as needed to support the detection and quantification of water quality anomalies and contaminants of concern, such as perchlorate, hexavalent chromium, and 1,2,3-trichloroethene (1,2,3-TCP). Watermaster has regularly assessed groundwater quality in the Chino Basin using data compiled through its own monitoring at private production wells and dedicated monitoring wells and the monitoring efforts of others. Watermaster reports on water quality trends and findings in several reports, including the State of the Basin Reports, which are prepared and submitted to the Court every two years.

In 2003, the Water Quality Committee was convened to coordinate many of the activities performed under PE 6. The Committee met intermittently through 2010. The main activities of the Water Quality Committee included investigations to characterize and address point and non-point sources of groundwater contamination in the Chino Basin and collaboration with the Santa Ana Regional Water Quality Control Board (Regional Board) in its efforts to facilitate the cleanup of groundwater contamination. Some of the significant groundwater quality investigations performed under the guidance of the committee included: the characterization of groundwater contamination in MZ-3 near the former Kaiser Steel Mill and Alumax facilities, tracking studies on the source and extent of the Chino Airport plume, the identification of sources and responsible Parties for the South Archibald plumes, and the identification of the sources of legacy perchlorate contamination in groundwater throughout the basin. The investigations were coordinated through the Water Quality Committee for the Chino Airport and South Archibald plumes and contributed to the definitive identification of responsible Parties and the issuance of cleanup and abatement orders by the Regional Board.

Since 2010, Watermaster has continued to perform monitoring for contaminants related to point-source and non-point source contamination, to assist the Regional Board with the investigation and regulation of point source contaminant sites in the Chino Basin, and to prepare status reports on the monitoring and remediation of point-source contaminant sites in the basin. Periodic status reports have been prepared for: the Chino Airport and South Archibald plumes[24] and the General Electric (GE) Test Cell plume, the GE Flatiron plume, the former Kaiser Steel Mill Facility plume, the CIM plume, the Stringfellow plume, and the Milliken Landfill plume. Updated delineations of the spatial extent of the plumes in the Chino Basin are prepared every two years by Watermaster and are included in the plume status reports and biennial State of the Basin Reports.

Currently, the responsible Parties for the Chino Airport plume and South Archibald plume are initiating remedial strategies that include the use of the Chino Basin Desalters for pumping and treating the contaminated groundwater associated with these plumes. This use of the Chino Basin Desalters as a mutually beneficial project was recognized in the OBMP Implementation Plan as a potential management strategy and provides cost sharing benefits to all involved Parties. Additionally, the CDA and IEUA have acquired over $85 million in federal and state grant funds for the Chino Basin Desalter Phase III expansion project that is planned to be used for portions of the remediation of the Chino Airport and South Archibald plumes.

3.2.6.2 Ongoing implementation actions for the 2020 OBMP

Pursuant to the PE 6 implementation plan, Watermaster will continue to perform the following to ensure that point-source contamination is being adequately addressed: monitor water quality at monitoring wells and private wells within the basin and collect data from others to support the quantification of point-source contaminant plumes, prepare updated delineations of the plume extents for the biennial State of the Basin Reports, and track and report on the status of remediation in the recurrent plume status reports and other ad-hoc investigations as needed to support the Regional Board in their efforts to address groundwater contamination. Watermaster will also continue to support the Regional Board or other Parties to identify and implement mutually beneficial projects for addressing groundwater contamination cleanup and identify outside sources to finance the cleanup efforts, such as the funds awarded for the Chino Desalter expansion project. Watermaster will continue to characterize and report on water-quality since OBMP implementation in the biennial State of the Basin Reports using data collected for the PE 1 Groundwater Quality Monitoring Program.

While PE 6 in the 2000 OBMP Implementation Plan provides a strategy to support the Regional Board in its efforts to address groundwater contamination cleanup in the Chino Basin, there are emerging contaminants with regulatory water quality standards set by the DDW that can impact the beneficial uses of groundwater. As described in the Scoping Report for Activity EF, there are contaminants in groundwater that limit its direct use for drinking water supply and reductions in pumping due to water quality challenges can result in negative impacts to the basin, such as reductions in net recharge, loss of hydraulic control, and movement of contaminant plumes. The enforceable drinking water standards developed by the DDW are continuously evolving and becoming more stringent as laboratory analytical technologies to detect contaminants are advancing. Hence, it is likely that new contaminants will be identified and regulated. The *Groundwater Quality Management Plan* envisioned for Activity EF is a

[24] Status reports for the Chino Airport and South Archibald plumes were prepared monthly in 2013; quarterly from 2014-2017; and semi-annually effective in 2018. Status reports for the other plumes and sites are prepared annually effective 2018.

refinement on PE 6 from the 2000 OBMP in that it is a proactive and basin-wide approach to address emerging contaminants to prepare the Parties for addressing compliance with new and increasingly stringent drinking water regulations defined by the DDW and ensure the long-term maximum beneficial use of the Basin.

3.2.7 Program Element 7. Develop and Implement Salt Management Plan

The 2000 OBMP included PE 7—*Develop and Implement Salt Management Plan*—to characterize current and future salt and nutrient conditions in the basin and to subsequently develop and implement a plan to manage them. Such a management strategy was necessary to address historical salt and nutrient accumulation from agricultural operations and to support the aggressive expansion of recycled water recharge and reuse envisioned in PEs 2 and 5.

The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 9 below. Each implementation action in Table 9 is categorized as a one-time or ongoing action, and the right-most column of the table indicates if the action was implemented.

Table 9. Program Element 7 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 1 through 3		
Develop salt budget goals, develop the salt budget tool and review all the OBMP actions.	One-time	✓
Watermaster will continue to monitor the nitrogen and salt management activities within the basin.	Ongoing	✓
Years 4 through 50		
As part of periodic updates of the OBMP, re-compute the salt budget using the salt budget tool. The salt budget tool will be used to reassess future OBMP actions to ensure the salt management goals are attained.	Ongoing	✓
Watermaster will continue to monitor the nitrogen and salt management activities within the basin.	Ongoing	✓

3.2.7.1 Implementation Progress since 2000

In 2002, recognizing that implementing the recycled water reuse program would require large-scale treatment and mitigation of salt loading under the then-current antidegradation objectives for TDS and nitrate defined in the Basin Plan, Watermaster and the IEUA petitioned the Regional Board to establish a maximum-benefit-based SNMP that involved (1) increasing the TDS and nitrate objectives for the Chino-North GMZ[25] to numerically higher values to enable maximization of recycled water reuse and (2) committing to a program of salt and nutrient management activities and projects ("maximum benefit

[25] The Chino-North GMZ has a maximum-benefit TDS objective of 420 mgl and is a combination of the Chino-1, Chino-2, and Chino-3 antidegradation GMZs that have lower TDS objectives, ranging from 250 to 280 mgl.

commitments") that ensure the protection of beneficial uses of the Chino-North GMZ and downgradient waters (the Santa Ana River and the Orange County GMZ). The technical work performed to support the maximum-benefit SNMP proposal included the development and use of an analytical salt budget tool to project future TDS and nitrate concentrations in the Chino-North GMZ with and without the maximum-benefit SNMP. The maximum-benefit SNMP was incorporated into the Basin Plan by the Regional Board in January 2004.

Implementation of the maximum-benefit SNMP is a regulatory requirement of the Basin Plan. The requirement is also incorporated into Watermaster and the IEUA's recycled water recharge program permit (R8-2007-0039) and the IEUA's recycled water discharge and direct reuse permit (R8-2015-0021; NPDES No. CA 8000409). There are nine maximum-benefit commitments included in the Basin Plan and recycled water permits:

1. The development and implementation of a surface-water monitoring program
2. The development and implementation of a groundwater monitoring program
3. The expansion of the Chino-I Desalter to 10 mgd and the construction of the Chino-II Desalter with a design capacity of 10 mgd
4. The additional expansion of desalter capacity to a total capacity of 40 mgd pursuant to the OBMP and the Peace Agreement
5. The construction of the recharge facilities included in the Chino Basin Facilities Improvement Program
6. The management of recycled water quality to ensure that the IEUA agency-wide, 12-month running average wastewater effluent quality does not exceed 550 milligrams per liter (mgl) for TDS and 8 mgl for total inorganic nitrogen (TIN)
7. The management of the basin-wide, volume-weighted TDS and nitrate concentrations of artificial recycled, storm, and imported waters to concentrations that are less than or equal to the maximum-benefit objectives as a five-year rolling average
8. The achievement and maintenance of the Hydraulic Control of groundwater outflow from the Chino Basin, specifically from the Chino-North GMZ, to protect the water quality of the Santa Ana River and downstream beneficial uses
9. The triennial recalculation of ambient TDS and nitrate concentrations of the Chino Basin GMZs

These commitments are all activities that were planned to be implemented under the OBMP through implementation actions within PEs 1, 2, 3, 5, and 7.

Watermaster and the IEUA are also required to prepare an annual report to the Regional Board on the status of implementation of the maximum-benefit commitments, including reporting of annual data collected through the monitoring program and assessments of compliance with the groundwater and recycled water-quality limits defined in the SNMP. If the maximum-benefit commitments are not implemented to the Regional Board's satisfaction, the antidegradation objectives would apply for regulatory purposes. The application of the antidegradation objectives would result in a finding of no assimilative capacity for TDS and nitrate in the Chino-North GMZ, and the Regional Board would require mitigation for all recycled water discharges to Chino-North that exceeded the antidegradation objectives retroactively to January 1, 2004. The retroactive mitigation for past discharges would be required to be completed within a ten-year period, following the Regional Board's finding that the maximum-benefit commitments were not met.

Watermaster has prepared and submitted annual reports to the Regional Board every year since 2005. As of the most recent annual report for CY 2018, Watermaster and the IEUA remain in compliance with all requirements of the maximum-benefit commitments.[26] A more detailed summary of the commitments and progress towards implementation is provided in Exhibit 14.

3.2.7.2 Ongoing implementation actions for the 2020 OBMP

Compliance with the maximum benefit commitments is an ongoing requirement of the Basin Plan. The ongoing actions to implement the maximum-benefit SNMP as currently defined in the basin, and thus PE 7, will include:

- Continue implementation of the surface and groundwater monitoring programs.
- Complete the expansion of the Chino Basin Desalter pumping capacity to 40,000 afy (expected in 2020).
- Maintain Hydraulic Control of the Chino-North GMZ through operation of the Chino Basin Desalters and other means, as necessary.
- Continue the storm and imported water recharge program to comply with recycled water recharge dilution requirements.
- Periodically analyze and report groundwater, surface water, and recycled water quality data to assess compliance with the metrics established in the maximum-benefit SNMP.
- Construct treatment and/or salt-offset facilities *if* one or more of the compliance metrics is exceeded.

There are three water-quality limitations and associated compliance metrics established in the maximum-benefit SNMP. When these metrics are exceeded, Watermaster and the IEUA must develop a plan and schedule to achieve compliance. The limitations, compliance metrics, and compliance actions are summarized in Exhibit 15.

The management actions for achieving compliance with the metrics once they are exceeded could include, but are not limited to: desalting recycled water to reduce TDS concentrations, increasing the recharge of low-TDS supply sources (storm or imported waters), or additional desalting of high-TDS groundwater as a salt offset.

With the exception of the ambient nitrate concentration of the Chino-North GMZ, which has exceeded the objective of 5.0 mgl since it was established in 2004, none of the other TDS and nitrate limitations have been exceeded. That said, the ambient TDS and nitrate concentrations in the Chino-North GMZ continue to increase due to legacy agricultural activities, recycled water reuse, and current irrigation practices. The current ambient TDS and nitrate concentrations are 360 and 10.3 mgl, respectively. Based on the rate of increase of the ambient TDS concentration since 1997, which has been about three mgl per year, the maximum-benefit objective of 420 mgl is not expected to be exceeded until about 2035.

More recently, the TDS concentration of recycled water has approached the compliance metric defined in commitment number 6. During the 2012 to 2016 drought, the 12-month running-average IEUA agency-wide TDS concentration in recycled water approached the 545 mgl action limit that would require the IEUA and Watermaster to submit a water-quality improvement plan and schedule. In analyzing the available data, the IEUA determined that the primary drivers for the increasing recycled

[26] WEI. (2019). *Optimum Basin Management Program Chino Basin Maximum Benefit Annual Report 2018*. April 2019.

water TDS concentration were the increase in the TDS concentration of the water supplies used by its member agencies and an increase of the TDS waste increment due to indoor water conservation. Similarly, drought conditions also threaten the ability to comply with the recycled water recharge dilution requirements. During drought conditions there is: a reduction in the amount of high-quality stormwater recharge, limited or no availability of imported water for recharge, an increase in the TDS concentrations of imported water, and a concomitant increase in the TDS concentrations of the recycled water. Not only are the two primary sources of low-TDS recharge water less available during drought periods, but the source water quality of municipal water supplies is also higher in TDS due to increases in imported water TDS and indoor water conservation practices. A more detailed discussion of this issue is provided in the Scoping Report. The Scoping Report discussion demonstrated the meaningful impact that drought has on compliance with the various recycled water quality metrics and indicates that climate change, which is expected to result in longer drier droughts, could potentially threaten future compliance with the limits.

Although the 12-month running-average IEUA agency-wide TDS concentration declined from the 2015 peak before reaching the 545 mgl action limit, it was an important indicator that the TDS concentration of recycled water is likely to approach or exceed the recycled water action limit during the next prolonged dry period and trigger the planning for recycled water quality improvements. In May 2017, recognizing the potential cost of implementing recycled water quality improvements for what might be only short-term exceedances of the action limit, Watermaster and the IEUA petitioned the Regional Board to consider updating the maximum-benefit SNMP to incorporate a revised compliance metric for recycled water TDS and nitrate specifically to allow a longer-term averaging period. The Regional Board agreed that an evaluation of the recycled water compliance metric is warranted and directed Watermaster and the IEUA to develop a technical scope of work to demonstrate the potential impacts of the revised compliance metric.

The primary objectives of the technical work to support the maximum-benefit SNMP and permit updates are: to develop and use an updated groundwater solute-transport model to evaluate the TDS and nitrate concentrations of the Chino Basin (e.g. a new salt-budget tool), to define alternative salinity management scenarios, and to project the future TDS and nitrate concentrations in the Chino Basin for each scenario. The results will be used to work with the Regional Board to develop a regulatory compliance strategy that potentially includes a new compliance metric based on a longer-term averaging period for recycled water TDS, contingent on the ongoing modeling and analysis efforts. The regulatory compliance strategy can also address any projected challenges in complying with the recycled water dilution requirements. The work began in September 2017 and is expected to be completed in 2020.

The Regional Board has indicated that in accepting any proposal to modify the recycled water compliance metrics, it will require Watermaster and the IEUA to add a new maximum-benefit commitment to the Basin Plan that involves updating the TDS and nitrate projections every five years. Thus, the need for the proactive planning to achieve compliance, as envisioned by Activity K, is a required ongoing activity under PE 7 and the maximum-benefit SNMP.

3.2.8 Program Element 8. Develop and Implement Groundwater Storage Management Program *and* Program Element 9. Develop and Implement Storage and Recovery Programs

The Judgment recognized the existence of unused storage space within the Chino Basin that could be used to store water for subsequent beneficial use. The Judgment requires that the use of such storage capacity be undertaken only under Watermaster control and regulation to protect all stored water, to protect Safe Yield, and to avoid adverse impacts to groundwater pumpers. The Judgment prioritizes the use of storage space by the Parties over the use of storage space for the export of stored water.

The 2000 OBMP included two PEs to address the management and use of storage space:

Program Element 8. Develop and Implement Groundwater Storage Management Program

Program Element 9. Develop and Implement Storage and Recovery Programs

The objectives of PE 8 are (1) to develop and implement a storage management plan that prevents overdraft, protects water quality, and ensures equity among the Parties, and (2) to periodically recalculate Safe Yield. The objective of PE 9 is to develop Storage and Recovery Programs that benefit all Parties in the basin and ensure that basin waters and storage capacity are put to maximum beneficial use without causing MPI to any producer or the basin.

The 2000 OBMP storage management plan in PE 8 consists of managing groundwater production, replenishment, recharge, and storage such that total storage within the basin ranges from a low of 5,300,000 af to a high of 5,800,000 af. The following definitions are included in the OBMP Implementation Plan to describe the storage management plan:

- Operational Storage Requirement (OSR) is the storage or volume in the Chino Basin that is necessary to maintain the Safe Yield. The OSR was estimated in the development of the OBMP to be about 5.3 million af.[27]
- Safe Storage is an estimate of the maximum amount of storage space in the basin that can be used and not cause significant water-quality and/or high-groundwater related problems. Safe Storage was estimated in the development of the OBMP to be about 5.8 million af.
- SSC is the difference between Safe Storage and the OSR and is the storage space that can be safely used by producers and Watermaster for storage programs. Based on the above, the SSC is about 500,000 af, including water in existing storage accounts. The allocation and use of storage space in excess of the SSC will preemptively require mitigation; that is, mitigation must be defined and resources committed to mitigation prior to its allocation and use.

The Peace Agreement describes the actions, programs, and procedures Watermaster will take in performance of Storage and Recovery Programs.[28]

The implementation plan for PEs 8 and 9 were combined in the OBMP Implementation Plan. The implementation actions incorporated into the 2000 OBMP Implementation Plan are summarized in Table 10 below. Each implementation action is categorized as a one-time or ongoing action and the right-most column of the table indicates if the action was implemented.

[27] This storage value was set as the estimated storage in the basin in 1997. See Page 2-11 of the OBMP Phase 1 Report.

[28] See Peace Agreement, § 5.2

Table 10. Program Elements 8 and 9 – Implementation Actions Defined in the 2000 OBMP

Implementation Action	One-time/ Ongoing	Implemented?
Years 1 through 3		
Evaluate the need to modify Watermaster UGRR* regarding storage management plans and procedures.	One-time	✓
Determine the operational storage requirement and safe storage.	One-time	✓
Years 4 through 50		
Start assessing losses at 2% per year in year 2005. This amount will be subject to modification in future years.	Ongoing	✓
In year 2010/11 and every ten years thereafter, compute Safe Yield and storage loss rate for prior ten-year period, and reset Safe Yield and storage loss rates for the next ten-year period. Reassess storage management plan and modify Watermaster UGRR, if needed.	Ongoing	✓

*UGRR stands for Uniform Groundwater Rules and Regulations. The UGRR was incorporated in the Watermaster's Rules and Regulations and is no longer a stand along document.

3.2.8.1 Implementation progress since 2000 and ongoing implementation actions for the 2020 OBMP

A final SSC of 500,000 af was established in the OBMP Implementation Plan. The water occupying the SSC includes Carryover, Excess Carryover, Local Storage, and Supplemental Waters stored by the Parties, including water stored for Storage and Recovery Programs. Carryover, Excess Carryover, Local Storage, and Supplemental Waters in storage accounts are referred to collectively as "managed storage."

Storage Agreements and Existing Managed Storage

The Restated Judgment provides that the Basin's groundwater storage capacity may be utilized for the storage and conjunctive use of supplemental water only under Watermaster control and regulation and that no use of such capacity be made except pursuant to written agreement with Watermaster.[29] The Pooling Plans of the Overlying (Non-Agricultural) Pool[30] and the Appropriative Pool[31] each require a Party to have an agreement with Watermaster as a condition of storing Excess Carryover water within the Basin. Watermaster has developed rules and regulations, standard storage agreements, and related forms pursuant to the Judgment and Peace Agreement.

There are three types of storage agreements that result in five types of storage accounts: Excess Carryover, Local Supplemental-Recycled, Local Supplemental-Imported, Pre-2000 Quantified Supplemental, and Storage and Recovery. An Excess Carryover account includes a Party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool Parties and Operating Safe Yield for Appropriative Pool Parties) and Basin Water acquired from other Parties. A Local Supplemental Water account includes imported and recycled water that is recharged by a Party and similar water acquired from other Parties. A Storage and Recovery account includes Supplemental Water and the

[29] See Restated Judgment, ¶ 11, 12 and Peace Agreement, § 5.2(a)

[30] See Restated Judgment Exhibit "G"

[31] See Restated Judgment Exhibit "H"

Peace Agreement requires that Watermaster shall give first priority to Storage and Recovery Programs that produce a "broad and mutual benefit to the Parties to the Judgment."[32]

In evaluating applications for storage agreements, Watermaster conducts an investigation to determine if the water stored and recovered under a proposed storage agreement has the potential to cause MPI to a Party or the basin. If Watermaster determines that implementation of the proposed storage agreement has the potential to cause MPI, the applicant must revise its application and demonstrate that there will be no MPI, or Watermaster must impose conditions in the storage agreement to ensure there is no MPI. Watermaster cannot approve a storage agreement that has the potential to cause MPI.

The Parties, amongst themselves, are also actively involved in water transfers of annual unproduced rights in the Safe Yield and water in their storage accounts. Watermaster has an application and review process for transfers that is similar to the storage agreement application process. Transfers are one way that the Parties recover water held in storage accounts.

The only active Storage and Recovery Program in the basin is the Metropolitan Dry-Year Yield Program (DYYP). The DYYP can store up to 100,000 af with maximum puts of 25,000 afy and maximum takes of 33,000 afy. The DYYP Storage and Recovery agreement provides that puts and takes can exceed these values if agreed to by Watermaster (as was done in fiscal years 2018 and 2009, respectively). The agreement that authorizes the DYYP will expire in 2028.

Watermaster tracks the puts, takes, losses, transfers, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process. Starting in 2005, pursuant to the Peace Agreement and OBMP IP, Watermaster began assessing losses in stored water at a rate of 2.0 percent per year. In February 2016, Watermaster changed the loss rate to 0.07 percent per year, based on the estimated groundwater discharge from the Chino-North GMZ to the Santa Ana River (a finding of the Safe Yield recalculation).

Exhibit 16 summarizes the amount of water in managed storage by the Parties and for the DYYP. The total volume of water in managed storage as of June 30, 2019 was about 549,200 af, which includes about 46,000 af stored in the DYYP account. As previously stated, and described below, in 2017, the IEUA adopted an addendum to the Peace II SEIR that provided a temporary increase in the SSC to 600,000 af through June 30, 2021 and required Watermaster to update the storage management plan.

Safe Yield Reset

Starting in 2011, Watermaster began the technical effort to recalculate the Safe Yield of the basin, which at that time was set at 140,000 afy. This work involved updating the hydrogeologic conceptual model of the basin, updating the historical hydrology, updating and recalibrating numerical models that simulate the surface and groundwater hydrology of the Chino Basin area, and projecting the surface and groundwater response of the basin to future management plans that included storage management. Watermaster's methodology for calculating Safe Yield was approved by the Court in April 2017.

This work is documented in *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement*[33] (hereafter, Safe Yield report). The results of that work yielded a

[32] See Peace Agreement, §5.2(c)(iv)(b)

[33] WEI. (2015). *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement.* October 2015. http://www.cbwm.org/docs/engdocs/WEI%202013%20CBWM%20Recalculation%20Model%20Update/20151005_WEI_2013_CBWM_Recal_Model_Final_low.pdf

reassessment of the hydrology of the basin from 1961 through 2011 and projections of basin hydrology through 2050, based on the best available planning information. And, based on the investigation results in the Safe Yield report, the Safe Yield was estimated to be 135,000 afy for the period FY 2010/11 to FY 2019/20.

The conclusions of the Safe Yield report related to storage management were:

- On July 1, 2000, the total water in storage in the basin was about 5,935,000 af, inclusive of about 236,000 af of managed storage. This is about 635,000 af greater than the OSR of 5,300,000 af that was established in the OBMP Implementation Plan.
- Managed storage was projected to increase from 487,000 af in 2016 to about 663,000 af by 2030 (exceeding the SSC by 163,000 af) and decline thereafter to zero af by 2051. Managed storage was projected to be used to meet future Replenishment Obligations.
- Total storage was projected to fall below the OSR of 5.3 million af in 2041.

Based on these findings, Watermaster conducted an investigation to determine if the use of managed storage up to 663,000 af would cause potential MPI and concluded it would not. Subsequently, the IEUA adopted an addendum to the Peace II SEIR to temporarily increase the SSC to 600,000 through June 30, 2021 to enable Watermaster and the Judgment Parties to update the OBMP storage management plan.

The next effort to recalculate Safe Yield is currently underway, and Watermaster is using the same Court-approved methodology used in the Safe Yield report to recalculate Safe Yield for the period FY 2020/21 to FY 2029/30.

2020 Storage Management Plan

The 2000 OBMP storage management plan is based on fixed storage volumes (e.g. the OSR, the SSC, and the Safe Storage), and its technical basis is not supported by new information available after the storage management plan was first developed. Review of the new information developed pursuant to the OBMP since 1999 indicated that it is possible to use more storage space than contemplated in the 2000 OBMP. This new information includes: an updated hydrogeologic conceptual model; 20 years of intensive monitoring of basin operations (not available in 1999), including monitoring the basin response as the total volume of managed storage approached 500,000 af; and groundwater model-based projections of the basin response to future management plans where the managed storage exceeded 500,000 af. The new information developed since 1999 also suggests that the use of managed storage to satisfy future desalter and other Replenishment Obligations could cause potential MPI and other adverse impacts: it has the potential to exacerbate land subsidence and pumping sustainability challenges, impact net recharge and Safe Yield, increase groundwater discharge through the CCWF and cause a loss of Hydraulic Control, and change the direction and speed of the contaminant plumes. Thus, Watermaster initiated a process to update the OBMP storage management plan to enable increased storage by the Parties and to include features that will ensure there is no MPI to a Party or the basin caused by the conjunctive-use activities of the Parties and Storage and Recovery Programs.

The *Storage Framework Investigation* (SFI) was completed in 2018 to the provide the technical information required to update the storage management plan.[34] In the SFI, future projections of the use of managed storage were estimated and evaluated for potential MPI. The SFI projected that for the

[34] WEI. (2018). *Storage Framework Investigation – Final Report*. Prepared for the Chino Basin Watermaster. October 2018.

planned use of up to 700,000 af of managed storage by the Parties that Hydraulic Control would be maintained, that there would be no MPI, and that there would be an adverse impact from the reduction of net recharge and Safe Yield attributable to the use of managed storage. The 2018 SFI also projected that for Storage and Recovery Programs that would operate in an identical manner to the existing Metropolitan DYYP and using the managed storage space between 700,000 af and 800,000 af. The SFI also evaluated the impacts of prospective Storage and Recovery Programs that would use up to an additional 200,000 af of storage space (total storage of 1,000,000 af) and projected that MPI and other adverse impacts could occur and described the potential facilities and operating concepts that, if implemented, would minimize potential MPI. The results of the SFI, together with the *Final 2020 Storage Management Plan White Paper,*[35] were used to inform the development of the *2020 Storage Management Plan* (SMP).

The Watermaster completed the 2020 SMP in December 2019, and it is included herein as Appendix E. The 2020 SMP no longer includes the management concepts of Safe Storage, OSR, and SSC that were a part of the 2000 OBMP storage management plan. The provisions of the 2020 SMP are described below.

The 2020 SMP includes the following provisions regarding the use of storage space in the basin:

- An aggregate amount of 800,000 af is reserved for the Parties' conjunctive-use activities (includes Carryover, Excess Carryover, and Supplemental Accounts) and Metropolitan's DYYP. This amount is referred to as the "First Managed Storage Band" (FMSB).
- An aggregate amount of 800,000 af is reserved for the Parties' conjunctive-use activities (includes Carryover, Excess Carryover, and Supplemental Accounts) and Metropolitan's DYYP. This amount is referred to as the "First Managed Storage Band" (FMSB).
- The managed storage space between 800,000 and 1,000,000 af is reserved for Storage and Recovery Programs.
    - Storage and Recovery Programs that utilize the managed storage space above 800,000 af will be required to mitigate potential MPI and other adverse impacts as if the 800,000 af in the FMSB is fully used.
    - Renewal or extension of the DYYP agreement will require the DYYP to use storage space above the 800,000 af of the FMSB.
- The allocation of storage space for use by Parties and for Storage and Recovery Programs may be revised in subsequent updates of the SMP.
- The use of managed storage greater than 1,000,000 af may be possible provided the storing entity submits a Storage and Recovery Program application, demonstrates that the program has broad mutual benefit, demonstrates that the program's mitigation measures will meet the mitigation requirements of the Watermaster to ensure there will be no MPI and other adverse impacts[36], complies with CEQA, and obtains approval from the Watermaster.

The 2020 SMP includes the following provisions regarding the use of spreading basin facilities for storage programs:

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[35] WEI. (2019). *Final 2020 Storage Management Plan White Paper*. Prepared for the Chino Basin Watermaster. July 2019.

[36] Adverse impacts include reductions in net recharge and Safe Yield; and an increase in the groundwater discharge from the Chino North GMZ to the Santa Ana River contributing to a loss of Hydraulic Control.

- Watermaster will prioritize the use of spreading basins to satisfy Watermaster's recharge and Replenishment Obligations over the use of spreading basins for other uses subject to limitations provided in existing agreements with the owners of the facilities.

The 2020 SMP includes the following provisions specific to the Parties and Storage and Recovery Program:

- With regard to the storage management activities of the Parties:
    - Watermaster acknowledges transfers or leases of water rights and water held in managed storage (hereafter transfers) from Parties that are situated such that they pump groundwater outside of MZ-1 to Parties that pump in MZ-1 have the potential to cause potential MPI.
    - Any reduction in net recharge caused by storage in the FMSB is an adverse impact, and Watermaster considers this adverse impact to be mitigated by the prospective calculation of Safe Yield.
- With regard to the Storage and Recovery Programs:
    - Puts and takes should be prioritized to occur in MZ-2 and MZ-3 to avoid new land subsidence and interfering with land subsidence management in MZ-1, to minimize pumping sustainability challenges, to minimize the impact of Storage and Recovery operations on solvent plumes, to preserve the state of Hydraulic Control, and to take advantage of the larger and more useful storage space in MZ-2 and MZ-3.
    - Watermaster will review each Storage and Recovery Program application, estimate the surface and ground water systems response, prepare a report that describes the response and potential MPI, and develop mitigation requirements to mitigate MPI caused by the proposed Storage and Recovery Program. The Storage and Recovery Program applicant will develop mitigation measures pursuant to these requirements and incorporate them into their Storage and Recovery Program application. Upon approval by Watermaster, these mitigation measures will be incorporated into the Storage and Recovery Program storage agreement.
    - Adverse impacts due to a Storage and Recovery Program must be mitigated. Adverse impacts include but are not limited to reductions in net recharge and Safe Yield and an increase in the groundwater discharge from the Chino-North GMZ to the Santa Ana River contributing to a loss of Hydraulic Control.
        - As part of the Storage and Recovery Program application review process, Watermaster will: make a projection of the program's expected impact on net recharge and Safe Yield and on the state of Hydraulic Control and review these impacts and develop mitigation requirements for the proposed Storage and Recovery Program.
        - The Storage and Recovery Program applicant will develop mitigation measures pursuant to these requirements and incorporate them into their Storage and Recovery Program application. Upon approval by Watermaster, these mitigation measures will be incorporated into the Storage and Recovery Program storage agreement.

        - Watermaster will estimate the reduction in net recharge and Safe Yield for each Storage and Recovery Program and deduct it from water stored in each Storage and Recovery Program storage account to compensate for its impact on net recharge and Safe Yield.

    - Watermaster will periodically review current and projected basin conditions and compare this information to the projected basin conditions prepared in the evaluation of the Storage and Recovery Program applications; compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations; make findings regarding the efficacy of related mitigation of MPI and other adverse impact requirements and measures in the Storage and Recovery Program storage agreements; and based on its review and findings, require changes in the Storage and Recovery Program agreements to mitigate MPI and adverse impacts.

The 2020 SMP includes the following provisions regarding the Storage Agreement Application Process:

- Watermaster will modify the existing Form 8 Local Storage Agreements to be consistent with an “evergreen agreement” paradigm and establish that the evergreen agreements will be valid for the duration of the Peace Agreement and will be automatically adjusted upon Watermaster’s approval of each subsequent Assessment Package so long as the cumulative amount of water in storage is less than the quantity reserved for the Parties’ conjunctive-use operations and Metropolitan’s DYYP (cumulatively, the FMSB) and Watermaster has made no finding that MPI is threatened to occur as a result of the increase in the quantity of water in storage.

The 2020 SMP includes the following provisions regarding the update of the SMP:

- Watermaster will periodically review and update the SMP at a frequency of no less than a once every five years, when the Safe Yield is recalculated, when it determines a review and update is warranted based new information and/or the needs of the Parties or the basin, and at least five years before the aggregate amount of managed storage by the Parties is projected to fall below 340,000 af.

4.0 2020 OBMP Update Management Plan

This section describes the recommended 2020 OBMP management plan for each of the nine PEs. The management plan is based on the ongoing 2000 OBMP implementation actions of each PE described in Section 3 and includes the new implementation actions listed in Section 2 for each of the 2020 OBMP Update Activities. For each management plan, the implementation action items are assigned a general schedule over a 20-year implementation period, and the actions are characterized as one-time or ongoing. Additionally, for each PE, the entities responsible for implementation of the PE management actions are identified.

The complete 2020 OBMP Update management plan, inclusive of all PEs, is summarized in Exhibit 17. Exhibit 17 lists each implementation action and characterizes if they originated from the 2000 OBMP or the 2020 OBMP Update and whether Watermaster deems their implementation required to administer the Physical Solution of the Judgment or comply with other regulatory or Watermaster requirements, including the basis for the requirements.

4.1 Program Element 1. Develop and Implement Comprehensive Monitoring Program

The objective of PE 1 is to collect the data and information necessary to support the implementation of all other OBMP PEs and to satisfy other regulations and Watermaster's obligations under its agreements, Court orders, and CEQA. Watermaster is responsible for the implementation of PE 1. The implementation actions and general schedule for implementation are summarized in Table 11 below.

Table 11. Program Element 1 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 3	
Watermaster will continue to conduct the required monitoring and reporting programs, including collection of: groundwater production, groundwater level, groundwater quality, ground level, surface water, climate, water supply planning, biological, and well construction/destruction monitoring data.	Ongoing
Perform review and update of Watermaster's regulatory and Court-ordered monitoring and reporting programs and document in a work plan: *OBMP Monitoring and Reporting Work Plan.*	One-time
Years 4 through 20	
Watermaster will continue to conduct the required monitoring and reporting programs pursuant to the *OBMP Monitoring and Reporting Work Plan* (or other guidance documents developed by Watermaster).	Ongoing
Perform periodic review and update of the *OBMP Monitoring and Reporting Work Plan* (or other guidance documents developed by Watermaster) and modify the monitoring and reporting programs, as appropriate.	Ongoing

4.2 Program Element 2. Develop and Implement Comprehensive Recharge Program

The objectives of PE 2 are to increase stormwater recharge to offset the recharge lost due to channel lining, to ensure there will be enough supplemental water recharge capacity available to Watermaster to replenish overdraft, and to maximize the recharge of recycled and supplemental waters to protect or enhance Safe Yield.

Watermaster, the IEUA, the CBWCD, and the SBCFCD are partners in conducting recharge in the Chino Basin and are jointly responsible for the implementation of PE 2. The implementation actions and general schedule for implementation are summarized in Table 12 below.

Table 12. Program Element 2 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 3	
Continue to convene the Recharge Investigations and Projects Committee.	Ongoing
Complete the 2023 Recharge Master Plan Update (RMPU).	One-time
Years 4 through 20	
Implement recharge projects based on need and available resources.	Ongoing
Continue to convene the Recharge Investigations and Projects Committee.	Ongoing
Update the RMPU no less than every five years (2028, 2033, 2038).	Ongoing

4.3 Program Element 3. Develop and Implement a Water Supply Plan for Impaired Areas

The objectives of PE 3 in the 2000 OBMP were to maintain and enhance Safe Yield and maximize beneficial uses of groundwater by constructing and operating the Chino Basin Desalters at an ultimate capacity of 40,000 afy. As described in Section 3.2.3, the final facilities to reach the ultimate capacity of 40,000 afy are under construction and are expected to be completed by 2021. Operation at this capacity, once all agricultural land uses have converted to urban uses, will fulfill the objectives of PE 3. Because the operation of the Chino Basin Desalters is necessary to attain Hydraulic Control, which is a regulatory requirement of the maximum benefit SNMP under PE 7, the implementation actions related to the ongoing operation of the Chino Basin Desalters are contained in PE 7. Thus, there are no separate implementation actions for PE 3 for the 2020 OBMP Update.

4.4 Program Element 4. Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1

The objective of PE 4 is to reduce or stop the occurrence of land subsidence and prevent ground fissuring in the Chino Basin or reduce it to tolerable levels. PE 4 achieves this objective by implementing the Watermaster's Subsidence Management Plan and updating the plan as warranted by data, analyses, and interpretations. Watermaster is responsible for the implementation of PE 4 with guidance from the GLMC.

The implementation actions for PE 4 and the general schedule for implementation are summarized in Table 13 below.

Table 13. Program Element 4 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 20	
Implement Watermaster's Subsidence Management Plan, and adapt it as necessary.	Ongoing
Watermaster will arrange for the physical recharge of at least 6,500 afy of Supplemental Water in MZ-1 as an annual average. Watermaster may re-evaluate the minimum annual quantity of Supplemental Water recharge in MZ-1 and may increase this quantity through the term of the Peace Agreement.	Ongoing

4.5 Program Element 5. Develop and Implement Regional Supplemental Water Program

The objective of this PE is to improve the regional conveyance and availability of imported and recycled waters throughout the basin. This is a basin-wide activity that involves the Parties, the IEUA, the TVMWD, and the WMWD. IEUA will continue to lead the efforts to maximize the reuse of IEUA recycled water in the Chino Basin. There are other current and forthcoming water supply reliability planning efforts by the IEUA, the Parties, and neighboring agencies that provide a prime opportunity to expand coordination and leverage the efforts for broad, regional benefit. Currently, the IEUA is preparing the 2020 IRP and conducting other related planning efforts with its member agencies. This effort could be expanded by neighboring agencies, including the TVMWD, the WMWD, or other Parties. Any of these agencies could lead and coordinate the collaborative, regional planning effort on behalf of the Parties. Watermaster would participate in the planning efforts, to ensure that any water supply or recycled water projects that are recommended for implementation are integrated with its groundwater management planning efforts and are consistent with the Judgment, Peace Agreements and other agreements, the Watermaster Rules and Regulations.

The implementation actions and general schedule for implementation are summarized in Table 14 below. Each action is categorized as one-time or ongoing.

Table 14. Program Element 5 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 20	
The IEUA will maximize the reuse of its recycled water in the Chino Basin.	Ongoing
The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish or expand future recycled water planning efforts to maximize the reuse of all available sources of recycled water.	Ongoing
Watermaster will support the IEUA, the TVMWD, the WMWD, and/or others in their efforts to maximize recycled water reuse to ensure these efforts are integrated with Watermaster's groundwater and salinity management efforts.	Ongoing
The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish or expand future integrated water resources planning efforts to address water supply reliability for all Watermaster Parties.	Ongoing
Watermaster will support the IEUA, the TVMWD, the WMWD, and/or others in their efforts to improve water supply reliability to ensure those efforts are integrated with Watermaster's groundwater management efforts.	Ongoing

4.6 Program Element 6. Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management

The objectives of PE 6 are to perform routine and coordinated water quality monitoring to characterize water quality in the Chino Basin so that there is adequate information to ensure that contamination sources are being addressed by water quality regulators and to help address compliance with new and increasingly stringent drinking water regulations for emerging contaminants established by the DDW.

The implementation actions and general schedule for implementation are summarized in Table 15 below.

Table 15. Program Element 6 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 3	
Re-convene the water quality committee and meet periodically to update groundwater quality management priorities.	Ongoing
Develop and implement an initial emerging contaminants monitoring plan.	One-time
Prepare a water quality assessment of the Chino Basin to evaluate the need for a Groundwater Quality Management Plan and prepare a long-term emerging contaminants monitoring plan.	One-time
Continue to support the Parties in identifying funding from outside sources to finance cleanup efforts.	Ongoing
Years 4 through 20	
Develop and implement a Groundwater Quality Management Plan and periodically update it.	Ongoing
Implement long-term emerging contaminants monitoring plan.	One-time
Continue to conduct investigations to assist the Parties and/or the Regional Board in accomplishing mutually beneficial objectives as needed.	Ongoing
Implement projects of mutual interest.	Ongoing

Watermaster will convene the Water Quality Committee and lead the stakeholder process to achieve the implementation actions for PE 6, including the development and implementation of a Groundwater Quality Management Plan and perform the initial and long-term water-quality monitoring at the monitoring and private wells sampled by Watermaster pursuant to PE 1.

Projects of mutual interest will be implemented pursuant to agreements among the implementing Parties with Watermaster support, as needed.

4.7 Program Element 7. Develop and Implement Salt Management Plan

The objective of PE 7 is to implement, and periodically update, the maximum-benefit SNMP. The SNMP is a management program to monitor, characterize, and manage current and future salt and nutrient conditions in the Chino Basin. The maximum-benefit SNMP enables the implementation of the recycled water recharge program in PE 2 and the direct reuse of recycled water in PE 5.

Watermaster and the IEUA are co-permittees for the maximum-benefit SNMP and the recycled water recharge program and will be jointly responsible for implementation of PE 7. The implementation actions and general schedule for implementation are summarized in Table 16 below.

Table 16. Program Element 7 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 3	
Complete the 2020 update of TDS and nitrate projections to evaluate compliance with maximum benefit salt and nutrient management plan, and, if necessary, based on the outcome, prepare a plan and schedule to implement a salt offset compliance strategy.	One-time
Continue to implement the maximum-benefit salt and nutrient management plan pursuant to the Basin Plan, including: • Implement monitoring program and reporting requirements • Maintain Hydraulic Control through operation of the Chino Basin Desalters and other means, as necessary • Increase and maintain desalter pumping at 40,000 afy • Continue storm and imported water recharge program to comply with recycled water recharge dilution requirements • Comply with recycled water TDS and TIN limitations • Compute ambient water quality every three years • Construct treatment and/or salt-offset facilities *if* one or more of the compliance limits are exceeded	Ongoing
Years 4 through 20	
Continue to implement the maximum-benefit salt and nutrient management plan pursuant to the Basin Plan, and any amendments thereto.	Ongoing
Starting in 2025 and every five years thereafter, update water quality projections to evaluate compliance with the maximum-benefit salt and nutrient management plan.	Ongoing

4.8 Program Element 8. Develop and Implement Groundwater Storage Program *and* Program Element 9. Develop and Implement Storage and Recovery Programs

The objectives of PEs 8 and 9 are to:

- Implement, and periodically update, a storage management plan that: (1) is based on the most current information and knowledge of the basin, (2) prevents unauthorized overdraft, (3) prioritizes the use of storage space to meet the needs and requirements of the lands overlying the Chino Basin and of the Parties over the use of storage space to store water for export.
- Support the development and implementation of Storage and Recovery Programs in the Chino Basin that provide defined benefits to the Parties and the basin.

Watermaster is responsible for the implementation of PEs 8 and 9. The implementation actions and general schedule for implementation are summarized in Table 17 below.

Table 17. Program Elements 8 and 9 – 2020 OBMP Management Plan

Implementation Action	One-time/ Ongoing
Years 1 through 3	
Complete and submit to the Court the 2020 Safe Yield Recalculation.	One-time
Complete and submit to the Court the 2020 Storage Management Plan.	One-time
Develop a *Storage and Recovery Master Plan* to support the design of optimized Storage and Recovery Programs that are consistent with the 2020 Storage Management Plan and provide the Watermaster with criteria to review, condition, and approve applications in a manner that is consistent with the Judgment and the Peace Agreement.	One-time
Assess losses from storage accounts based on the findings of the 2020 Safe Yield Recalculation.	Ongoing
Years 4 through 20	
Update the Storage Management Plan in 2025 and every five years thereafter and when: • the Safe Yield is recalculated, • Watermaster determines a review and update is warranted based new information and/or the needs of the Parties or the basin, and • at least five years before the aggregate amount of managed storage by the Parties is projected to fall below 340,000 af	Ongoing
Perform Safe Yield recalculation every 10 years (2030, 2040).	Ongoing
Update the storage loss rate following each recalculation of Safe Yield (2030, 2040) and during periodic updates of the SMP.	Ongoing

Exhibit 1 – Drivers and Trends and Their Implications
2020 OBMP Update

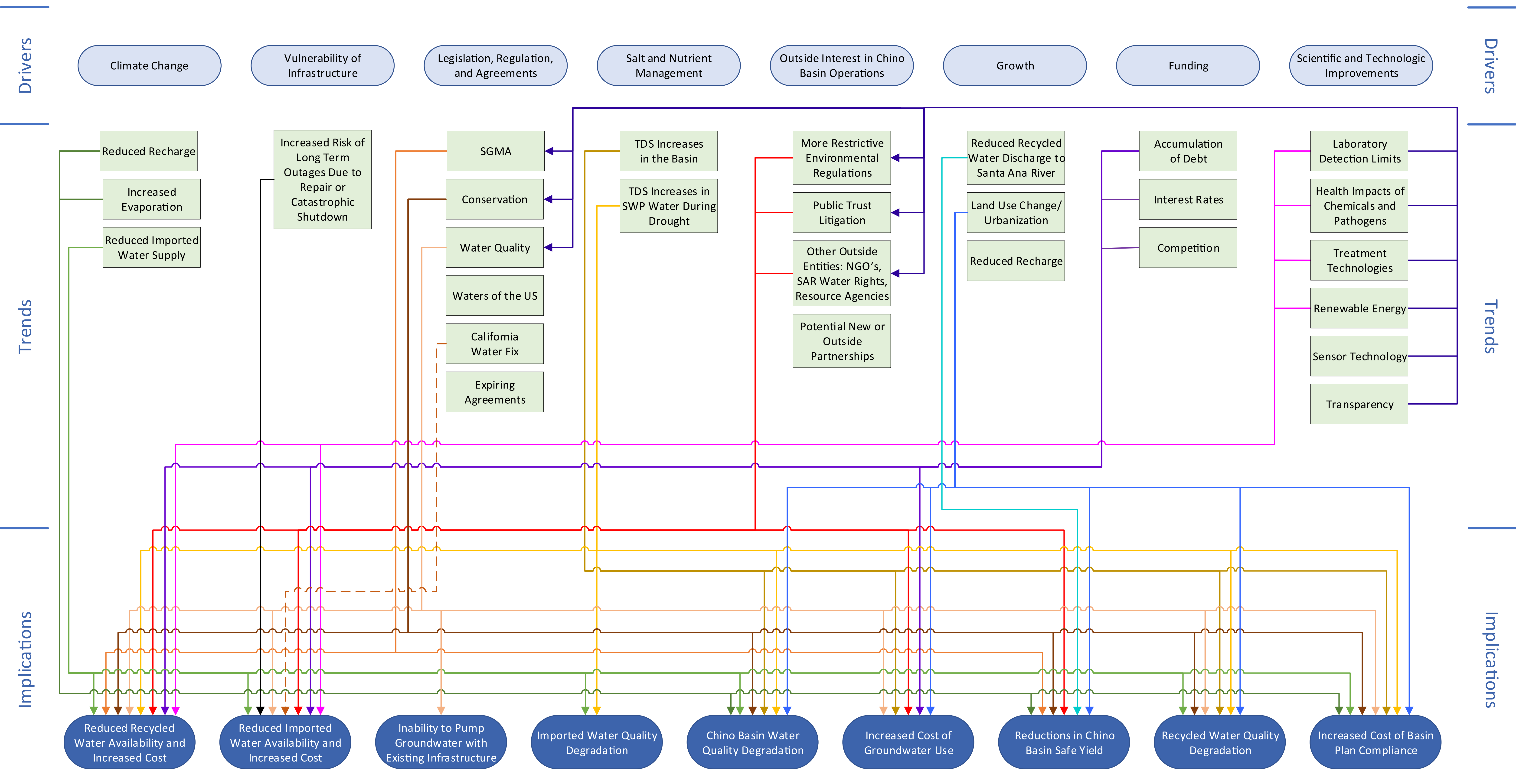

Exhibit 2
Comparison of the 2000 and 2020 OBMP Process

2000 OBMP

OBMP Phase 1 Report

1. Introduction
2. State of the Basin
3. OBMP Goals
4. Management Plan

OBMP Implementation Plan Program Elements (PEs)

1. Monitoring
2. Recharge Program
3. Water Supply Plan for Impaired Areas
4. Subsidence Management
5. Regional Supplemental Water Program
6. Cooperative Program with Regulators
7. Salt Management Plan
8. Storage Management Plan
9. Storage and Recovery Programs

Peace Agreement

OBMP PEIR

2020 OBMP Update

2020 OBMPU Scoping Report (TM1)

1. Introduction
2. Development of Activities
3. Scope of Work to Perform Proposed 2020 OBMP Update Activities.
   - Activity A: Increase the capacity to store and recharge storm and supplemental water
   - Activity B: Develop, implement and optimize Storage and Recovery Programs
   - Activity D: Maximize use of recycled water
   - Activity E/F: WQ Management Plan and Strategic Compliance Solutions
   - Activity C/G: Regional conveyance and treatment
   - Activity K: Salt and Nutrient Management Plan compliance
   - Activity L: Appropriate Monitoring

Integrate 2000 OBMP PEs with 2020 OBMP Update Activities

2020 OBMP Update Report (TM2)

1. Introduction
2. 2020 OMBP Goals and Activities
3. Integration of the 2020 OBMP Update Activities to the 2000 OBMP Program Elements.
4. 2020 OBMP Update Management Plan

2020 OBMP Implementation Plan

Implementation Agreement

2020 OBMP PEIR

Exhibit 3
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 3*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural											
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA	Overlying Non-Ag	IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Reductions in Chino Basin Safe Yield																						
Develop a storage management plan to optimize the use of unused storage space in the basin, avoid undesirable results, and encourage Storage and Recovery Programs	Need	Need		Need	Need			Need	Need	Need	Need		Want		Need		Need				B, C	1, 2, 3
Design storage management and storage & recovery programs that maintain or enhance Safe Yield	Need	Want						Need	Need	Want			Need		Want		Want			Want	B, C	1, 3
Maintain or enhance the Safe Yield of the basin without causing undesirable results	Need	Want		Need	Need			Need	Need	Need	Want				Want		Want			Need	B, D	1, 3
Manage the basin Safe Yield for the long-term viability and reliability of groundwater supply	Need	Want						Need	Need	Need	Need			Need			Want	Want		Need	A, B, C	1, 3
Reassess the frequency of the Safe Yield recalculation	Want				Want												Want				I	3
Continue to model and track Safe Yield, but utilize other management strategies to address a decline.																	Want				B	1, 3
Develop recharge programs that maintain or enhance Safe Yield	Need	Want					Want	Want	Need	Want					Want		Want			Want	A, B	1, 3
Develop more facilities to capture, store, and recharge water	Want	Need					Need			Want	Want				Want		Want				A, B, D	1, 2
Enhance recharge in northeast MZ-3	Want		Want						Need								Want				A, C	1, 3
Maximize use of existing recharge facilities	Want	Want						Want	Need	Want											A, C, F, G	3
Establish incentives to encourage recharge of high-quality imported water	Want		Want																		H, I	2, 3
Develop an OBMP Update that is consistent with the Physical Solution and allows access to the basin for users to meet their requirements	Need	Want				Need		Need													C, E	3
Engage with regional water management planning efforts in the Upper Santa Ana River Watershed that have the potential to impact Chino Basin operations or Safe Yield	Want														Need		Want			Need	I, D	3

Exhibit 3
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ● Want/Unspecified

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	Appropriative										Agricultural			Overlying Non-Ag								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Inability to Pump Groundwater with Existing Infrastructure																						
Pursue collaborative, regional partnerships to implement regional solutions to water management challenges	●			●	●			●							🔴	●	●	●	🔴	🔴	B, E, F, G, I	3
Ensure that sufficient, reliable water supplies will be available to meet current and future water demands	🔴	🔴	🔴	🔴			●	🔴	●	●	●				🔴	●	●	🔴	●		A, B, D, G	1, 3
Develop conjunctive use agreements that provide certainty in the ability to perform during put and take years by clearly defining facilities/infrastructure and operating plans, and that leverage the lessons learned from obstacles encountered during the implementation of the current Dry Year Yield program	●						●	●	●						●		●	●			B, G, I	1, 2, 3
Develop management strategies that enable the Parties to produce or leverage their respective water rights that may be impacted by physical basin challenges like land subsidence or water quality	🔴						●	🔴							●		●				A, C, D, E, F, G, I	3
Design storage management and storage & recovery programs to raise funding to build infrastructure	●			●											●		●				B, D, I, J	3, 4
Develop process to support/facilitate project implementation	●																				F, H, J	4
Design subsidence management plans to allow flexibility in the location and volume of groundwater production in MZ-1 and MZ-2	●						●	🔴		🔴				●	●						A, C, G	3

Exhibit 3
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ● Want/Unspecified

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	Appropriative										Agricultural			Overlying Non-Ag								
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Increased Cost of Groundwater Use																						
Seek supplemental financial resources to support the implementation of the OBMP Update	🔴	🔴		●			●	🔴	🔴	●					●	🔴	●		●		D, F, G, I, J	4
Develop regional partnerships to help reduce costs	●			●			●	●	🔴						🔴	●	●			●	F, G, I, J	4
Monetize agencies' unused water rights for equitable balance of basin assets			●																		G, H	4
Decrease Watermaster assessment costs	●				●			●													I, J	4
Support to develop a justification for increases in water rates and developer fees to invest in needed water infrastructure	🔴	●							●								●				F, G, H	
Develop an equitable distribution of costs/benefits of the OBMP	●	●		●		🔴	●	🔴	🔴	●				🔴	●						H, J	4
Watermaster assessments for implementation of the OBMP should be allocated based on benefits received	●				●																H	4
Continue or enhance incentives to pump groundwater from the Chino Basin			🔴																		G, I	3, 4
Improve flexibility for Parties to execute water rights transfers														🔴							G, I	4

Exhibit 3

Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ● Want/Unspecified

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	Appropriative										Agricultural			Overlying Non-Ag								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Chino Basin Water Quality Degradation																						
Develop a water quality management plan to ensure ability to produce groundwater rights	🔴	●		●			●	●	●	●				🔴	●		●	●			E, F, G, J	2, 3
Develop regional infrastructure to address water quality contamination and treatment				●	●			●													A, B, C, E, F, G, I, J	2
Plan for and be prepared for new drinking water quality regulations that may result in an increase in groundwater treatment and costs	●	●	🔴	🔴			🔴	●	🔴	●					🔴		●				E, F	2
Be more proactive and engaged in the process to develop new drinking water quality regulations								●													A, B, D, E, G, J	2
Recycled Water Quality Degradation																						
Maintain compliance with recycled water and dilution requirements pursuant to the Chino Basin groundwater recharge permit		●					●	●	🔴	🔴				🔴	🔴						A, B, D, E, G, J	2
Increased Cost of Basin Plan Compliance																						
Develop management strategy to ensure sufficient supplies to blend with recycled water and comply with Salt and Nutrient Management Plan	●	●									🔴				●		●				G, K	2
Perform the minimum amount of monitoring/reporting that is required for basin management and regulatory compliance	●			●			●	●													L	3, 4

Exhibit 3
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ● Want/Unspecified

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Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 3*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural											
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA	Overlying Non-Ag	IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Reduced Recycled Water Availability and Increased Cost																						
Fully utilize IEUA recycled water resources		🔴		●			●	●		🔴					●						A, D, E, F, G	1
Maximize the use of recycled water for direct use or recharge	●	🔴		🔴			●	🔴	🔴	🔴					●						A, D, E, F, G	1
Evaluate the potential for direct potable reuse of recycled water	●								●						●						D, E, F	1
Develop alternative management strategies to comply with the recycled water discharge obligations to the Santa Ana River	●	●		●			●	●		●					●		●				D, E, F	1, 3
Utilize non-IEUA sources of recycled water that are not being put to beneficial use	🔴	●					●	●	🔴	🔴					●		●				D, E, F	1
Other																						
Coordinate timing of agreements, grants, etc. to ensure implementation of the OBMP Update	●							●	🔴	●					●	●	●				F, G, H, I, J	
Improve communication between the Parties	🔴			🔴				●						🔴	●		●				F, H, I	
Educate elected officials and decision makers on the need and urgency to address the water management challenges	●	🔴							🔴						●	●	●				F, G, H, I, J	
Consider a long-term planning horizon of up to 50 years	●								●	●					●						F, G, H, I, J	3

Exhibit 3

Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

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Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 3*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural			Overlying Non-Ag								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Reduced Imported Water Availability and Increased Cost																						
Ensure that there is a reliable local water supply to replace imported water during shut down of imported water delivery infrastructure for maintenance and longer-term emergency outages	● Need	●	●	● Need			●	● Need	●	●					● Need	● Need	● Need	● Need			B, C, G	1, 3
Identify and utilize new sources of supplemental water	● Need	●		●			● Need	●	●	●					●	●	●				A, B	1, 3
Construct inter-basin and intra-basin connections for the benefit of regional water supply and conjunctive use	●	●		● Need			●	●	● Need			● Need			●	● Need	●	● Need			C, G	1, 3
Understand how imported water reliability from Metropolitan Water District will be affected with and without the California Water Fix	●							●	● Need						●	●	●				-	1, 3
Develop management strategies that ensure Parties will meet future Chino Basin Desalter Replenishment Obligation and have the money to fund it	●	●		● Need			● Need		●								●			● Need	H, I, J	3
Increase water-supply reliability at the lowest possible cost	● Need			●			●	●				● Need		● Need	●		●				A, B, D, J	3
Need a better understanding of the water management plans of the Parties to be able to better plan for imported water needs and to assure reliability of Metropolitan Water District water supply	●			●					● Need			● Need			●	●	●	● Need			A	3
Analyze water management scenarios that plan for unexpected challenges and emergencies	●							●	● Need	●					●	●	●				E, G	3
Ensure that sufficient supplemental water supplies will be available to meet future replenishment requirements							●		● Need	●		● Need			●					● Need	A	1, 3
Despite the best efforts of the Parties to decrease reliance on imported water, the cost of the total water supply continues to increase	●																				-	3
Use more recycled water for Replenishment Obligation	●			● Need			● Need		● Need								●				A, D, E, F	3
Continue to build collaborative programs between the Metropolitan Water District and Chino Basin	● Need						●	●	●						●		●	●			B, I	3

Exhibit 4
Activities for Consideration in the 2020 OBMP Update

ID	Activity
A	Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge
B	Develop, implement, and optimize Storage-and-Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality.
C	Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence.
D	Maximize the reuse of recycled water produced by IEUA and others
E	Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses
F	Develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits in managing water quality
G	Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure.
H	Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements
I	Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement
J	Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update
K	Develop management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge
L	Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance

Exhibit 5

OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
			Reductions in Chino Basin Safe Yield	Inability to Pump Groundwater with Existing Infrastructure	Increased Cost of Groundwater Use	Chino Basin Water Quality Degradation	Recycled Water Quality Degradation	Increased Cost of Basin Plan Compliance	Reduced Recycled Water Availability and Increased Cost	Reduced Imported Water Availability and Increased Cost
Goal 1 - Enhance Basin Water Supplies										
1a • Not all of the stormwater runoff available to the Chino Basin is diverted and recharged; failure to divert and recharge stormwater is a permanently lost opportunity. • The existing methodology to select recharge projects for implementation is based on the cost of imported water. There are currently no known projects with a unit cost lower than the cost of imported water, hindering expansion of stormwater capture and recharge • Pumping capacity in some areas of the basin is limited due to low groundwater levels, land subsidence, and water quality	A Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge	• Increases recharge of high-quality stormwater that will: • protect/enhance the Safe Yield, • improve water quality, • reduce dependence on imported water, • increase pumping capacity in areas of low groundwater levels and areas of subsidence concern, and • provide new supply of blending water to support the recycled-water recharge program. • Provides additional supplemental-water recharge capacity for replenishment and implementation of Storage and Recovery Programs. • Provides additional surface water storage capacity. • Revised economic criteria for selecting recharge projects for implementation.	✓	✓	✓	✓	✓	✓		✓

Exhibit 5
OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
			Reductions in Chino Basin Safe Yield	Inability to Pump Groundwater with Existing Infrastructure	Increased Cost of Groundwater Use	Chino Basin Water Quality Degradation	Recycled Water Quality Degradation	Increased Cost of Basin Plan Compliance	Reduced Recycled Water Availability and Increased Cost	Reduced Imported Water Availability and Increased Cost
Goal 1 - Enhance Basin Water Supplies										
1b • There is a surplus of recycled water potentially available to the Chino Basin Parties that is not being put to beneficial use. • Existing infrastructure limits the expansion or reuse and recharge of recycled water in the Chino Basin. • Existing requirements to discharge recycled water to the Santa Ana River limit the amount of IEUA recycled water available for reuse and recharge •The Department of Drinking Water and the Regional Board blending requirements for recycled water recharge could limit expanded recharge opportunities	D Maximize the reuse of recycled water produced by IEUA and others	• Results in a new, consistent volume of in-lieu and/or wet water recharge that will: • protect/enhance the Safe Yield, • reduce dependence on imported water, • improve water-supply reliability, especially during dry periods, and • increase pumping capacity in areas of low groundwater levels and areas of subsidence concern. • Identify additional sources of water to satisfy IEUA discharge requirements pursuant to the Santa Ana River Judgment.	✓	✓					✓	✓

Exhibit 5

OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

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Goal 2 - Protect and Enhance Water Quality										
2a • Areas of the basin are contaminated with VOCs, nitrate, perchlorate and other contaminants of emerging concern (CECs). • Water-quality regulations are evolving and becoming more restrictive, which limits the beneficial uses of groundwater. • Groundwater treatment may be necessary to meet beneficial uses, but can be expensive to build and operate. • The basin is hydrologically closed, which causes accumulation and concentration of salts, nutrients, and other contaminants. • Some stored water in the Chino Basin cannot be used due to water quality and insufficient treatment capacity • Recharge sources may contribute CECs to the groundwater basin	E Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses F Develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits in managing water quality	• Proactively addresses new and near-future drinking water regulations. • Enables the Parties to make informed decisions on infrastructure improvements for water-quality management and regulatory compliance. • Removes groundwater contaminants from the Chino Basin and thereby improves groundwater quality. • Enables the Parties to produce or leverage their water rights that may be constrained by water quality. • Ensures that groundwater is pumped and thereby protects/enhances the Safe Yield.	✓	✓	✓	✓				✓
2b • Water-quality regulations are evolving and generally becoming more stringent, which could limit the reuse and recharge of recycled water.	K Develop management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge	• Enables the continued and expanded recharge of recycled water, which will: • protect water quality, • improve water-supply reliability, especially during dry periods, and • protect/enhance the Safe Yield.	✓			✓	✓	✓		✓

Exhibit 5
OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
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Goal 3 - Enhance Management of the Basin										
3a • Existing infrastructure (pumping and treatment capacity and conveyance) is insufficient to conduct puts and takes under proposed storage programs. • There is unused storage space in the Basin the use of which is constrained by the storage limits defined in existing CEQA documentation. • Watermaster's current storage management plan is not optimized to protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain Hydraulic Control, etc. • Storage and recovery operations could be limited by contaminant plumes or other CECs in groundwater	B Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality.	• Storage programs that protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain Hydraulic Control, etc. • New regional infrastructure to optimize put and take operations • Leverages unused storage space in the Basin. • Reduces reliance on imported water, especially during dry periods. • Potentially provides outside funding sources to implement the OBMP Update. • Improves water quality through the recharge of high quality water.	✓	✓	✓	✓				✓

Exhibit 5
OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
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Goal 3 - Enhance Management of the Basin										
3b • Land subsidence in northwest MZ1 may limit the ability for Parties to pump their respective rights in this area. • Poor water quality and increasingly restricting water quality regulations limits the ability for some Parties to pump their respective rights. • Low groundwater levels impact pumping capacity	C Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence. G Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure.	• Enables producers in MZ1 and MZ2 to obtain water through regional conveyance, which supports management of groundwater levels to reduce the potential for subsidence and ground fissuring. • Enables the Parties to increase production in areas currently constrained by poor water quality. • Removes groundwater contaminants from the Chino Basin and thereby improves water quality. • Protects/enhances the Safe Yield. • Maximizes the use of existing infrastructure, which will minimize costs. • Provides infrastructure that can also be used to implement Storage and Recovery Programs.	✓	✓	✓	✓				✓
3c • Watermaster needs information to comply with regulations and its obligations under its agreements and Court orders, yet financial resources to collect this information are limited.	L Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance	• Ensures full compliance with regulatory requirements. • Ensures full support of basin management initiatives. • Enables Parties to monitor the performance of the OBMP Update. • Continual review and revision of requirements and monitoring program to ensure cost efficiency	✓	✓	✓	✓	✓	✓	✓	✓

Exhibit 5

OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
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Goal 4 - Equitably Finance the OBMP										
4a • The distribution of benefits associated with the OBMP Update is not defined. • Funding needed for the OBMP implementation activities of the Watermaster is not projected beyond the current year budget, which limits Parties ability to plan required funding for the future. • There is currently no formal process to evaluate and adapt the OBMP implementation plan, schedule and cost.	H Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements	• Provides transparency as to the benefits of the OBMP Update activities • Identifies Watermaster roles and costs to the Parties • Formal process to revisit implementation plan and adjust priorities and schedule as necessary to address changed conditions • Periodic updates of cost projections for OBMP implementation needed to plan financial resources. • Improves readiness to apply for grants as they become available • Improves the likelihood that the OBMP will be implemented.			✓			✓	✓	✓
4b • Limited financial resources constraint the implementation of the OBMP. • Future reliability of grant funding is uncertain	I Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement	• Lowers the cost of OBMP implementation. • Improves the likelihood that the OBMP will be implemented.			✓			✓	✓	✓
	J Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update				✓			✓	✓	✓

Exhibit 6

2020 OBMP Update - Activity A:

Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental waters, particularly in areas of the basin that will promote the long-term balance of recharge and discharge

Need and Objectives: The objectives of Activity A are (1) to maximize stormwater capture pursuant to Watermaster's diversion permits, (2) to promote the long-term balance of recharge and discharge, (3) to ensure sufficient supplemental water recharge capacity for future replenishment, (4) to reduce dependence on imported water by maintaining or enhancing Safe Yield, (5) to improve water quality, and (6) to ensure a supply of dilution water to comply with recycled water recharge permit requirements. Based on the alignment of the objectives of Activity A with those of the RMPU, Activity A can be accomplished through the existing RMPU process.

Phase	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ?
S	1 – Define objectives and refine scope of work	Consensus on objectives of 2023 RMPU	Convene the Recharge Investigations and Projects Committee	The process to perform these steps is required to the extent that additional recharge capacity is needed to meet replenishment obligations. If, in scoping the committee does not establish the additional need to evaluate projects beyond replenishment capacity, those projects are not required to be evaluated.
PN	2 – Develop planning, screening, and evaluation criteria	New criteria for selecting projects	Technical support role	
PAE	3 – Describe recharge enhancement opportunities 4 – Develop reconnaissance-level engineering design and operating plan	Conceptual design, operating plans, and costs of recharge alternatives Project implementation and financing plan	Technical support role	
I	5 – Plan, design, and construct selected recharge projects	New recharge projects	Technical support role	Yes, to the extent that additional recharge capacity is needed for replenishment.

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

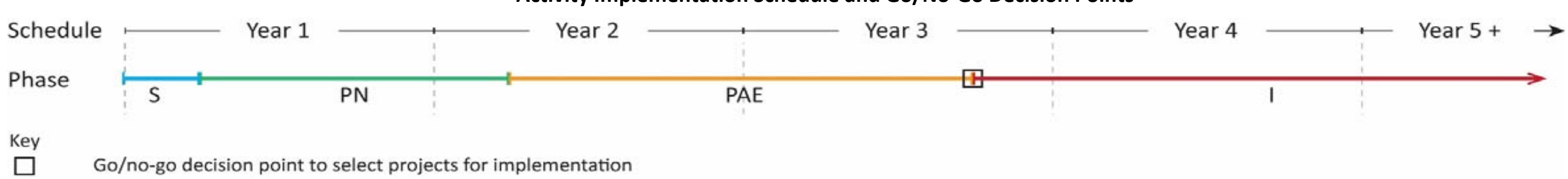


Exhibit 7
2020 OBMP Update - Activity B

Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality

Need and Objectives: The parties desire to develop and implement "optimized" Storage and Recovery Programs that avoid potential MPI and provide broad benefits, such as increased water-supply reliability, protected or enhanced Safe Yield, improvements to water quality, and reduced cost for OBMP implementation. The objectives of Activity B are to prepare a *Storage and Recovery Master Plan* in a collaborative setting that clearly articulates the specific objectives of the parties and the required benefits to be realized from storage and recovery programs. The master plan will assist the parties and their storing partners to select and implement Storage and Recovery Programs that achieve the their objectives and the desired benefits.

Phase*	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ?
S	1 – Convene the Storage and Recovery Program Committee, define objectives, and refine scope of work	Consensus on objectives and desired benefits of Storage and Recovery Programs	Convene committee	Section 5.2.c.iv.(b) of the Peace Agreement states that "Watermaster shall prioritize its efforts to regulate and condition the storage and recovery of water developed in a Storage and Recovery Program for the mutual benefit of the Parties to the Judgment and give first priority to Storage and Recovery Programs that provide broad mutual benefits." Watermaster must document the basis by which it will review, condition, and approve applications in a manner that is predictable, uniform, and consistent with the Peace Agreement and the 2020 SMP. A master plan is the most efficient process to do this.
PN	2 – Develop conceptual alternatives for Storage and Recovery Programs at various scales	Conceptual descriptions of various types of Storage and Recovery Programs that achieve the objectives defined in Task 1	Assist in the development and documentation of conceptual alternatives	
PAE	3 – Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives	Conceptual design, operating plans, and costs for various Storage and Recovery Program alternatives	Assist in development of alternatives Groundwater modeling to estimate basin response	
I	4 – Prepare *Storage and Recovery Program Master Plan*	*Storage and Recovery Program Master Plan* that will support Storage and Recovery Program selection, solicitation of storing partners, applications for funding, and Watermaster approvals	Prepare draft and final master plan	

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

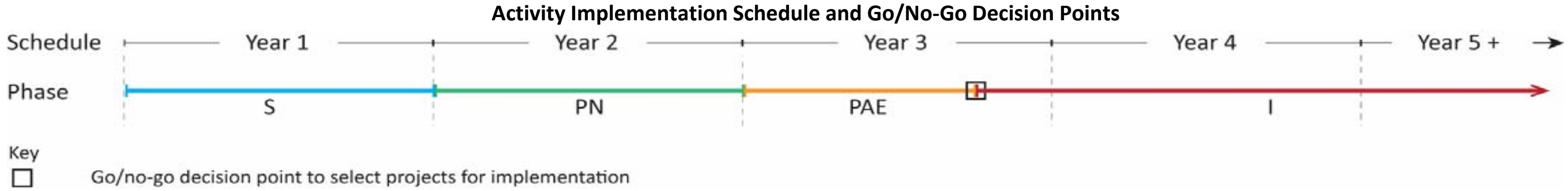


Exhibit 8

2020 OBMP Update - Activity CG:

Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence AND Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure

Need and Objectives: The parties have identified that there are basin management challenges, such as land subsidence and poor water quality, that could limit their ability to exercise their pumping rights using existing infrastructure. Additionally, there are numerous challenges to the reliability of the non-Chino Basin groundwater water supplies available to the Chino Basin parties and the infrastructure that deliver them. The objectives of Activity CG is to optimize the use of all sources of water available to the parties to meet their demands despite these challenges and potentially help mitigate them.

Phase	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ?
S	1 - Form the Water Supply Reliability Committee, define objectives, and refine scope	Mutual understanding of the universe of water reliability concerns of parties	Work with IEUA or other activity lead	Although these actions optimize the management of all available water supplies to achieve water supply reliability, they are not required outcomes.
PN	2 - Characterize water demands, water supply plans, and existing/planned infrastructure and its limitations	Identify opportunities and limitations in the existing/planned infrastructure to meet reliability goals defined in Task 1	Work with IEUA or other activity lead	
PAE	3 – Develop planning, screening, and evaluation criteria 4 – Identify and describe water supply reliability opportunities 5 – Develop reconnaissance-level engineering design and operating plan	Conceptual design, operating plans, and costs of reliability alternatives Project implementation and financing plan	Work with IEUA or other activity lead	
I	6 – Plan, design, and build water reliability projects	New water reliability projects	None	

**Phase Descriptions: S = Scoping   PN = Evaluate need for project   PAE = Project alternative evaluation   I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

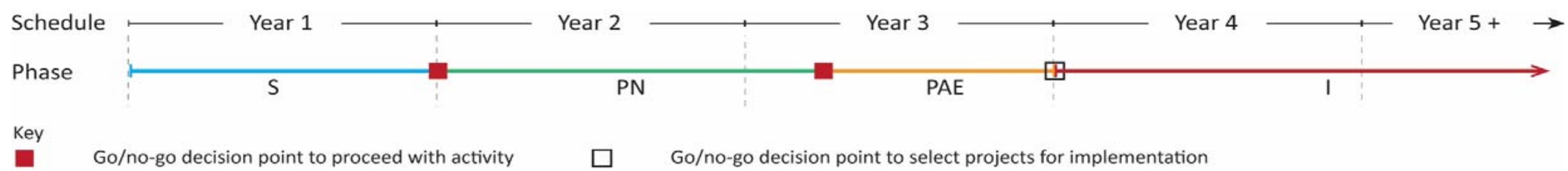


Exhibit 9

2020 OBMP Update - Activity D:

Maximize the reuse of recycled water produced by IEUA and others

Need and Objectives: The objective is to maximize the reuse of recycled water produced by the IEUA and other publicly owned treatment works (POTWs) in proximity to the Chino Basin to meet future demands and improve local water-supply reliability, especially during dry periods. Expanded reuse activities could include direct non-potable reuse (landscape irrigation or industrial uses), groundwater recharge (indirect potable reuse), and direct potable reuse. Increasing recycled water reuse is an integral part of the OBMP's goal to enhance water supplies. The direct use of recycled water increases the availability of native and imported waters for higher-priority beneficial uses.

Phase	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ?
S	1 – Convene Recycled Water Projects Committee, define objectives and refine scope of work	Consensus on the objectives for optimizing and maximizing recycled water reuse	Work with IEUA or other activity lead	Although these actions optimize the management of all available recycled water supplies to achieve water supply reliability, they are not required outcomes.
PN	2 – Characterize the availability of all recycled water supplies and demands	Understanding of demand and opportunities for increased recycled water reuse	Work with IEUA or other activity lead	
PAE	3 – Develop planning, screening, and evaluation criteria 4 – Identify and describe potential projects for evaluation 5 – Conduct a reconnaissance-level study for the proposed projects	Conceptual design, operating plans, and costs of reuse projects Characterization of SNMP impacts of reuse projects Project implementation and financing plan	Work with IEUA or other activity lead	
I	6 – Plan, design, and construct selected projects	New recycled water reuse projects	None	

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

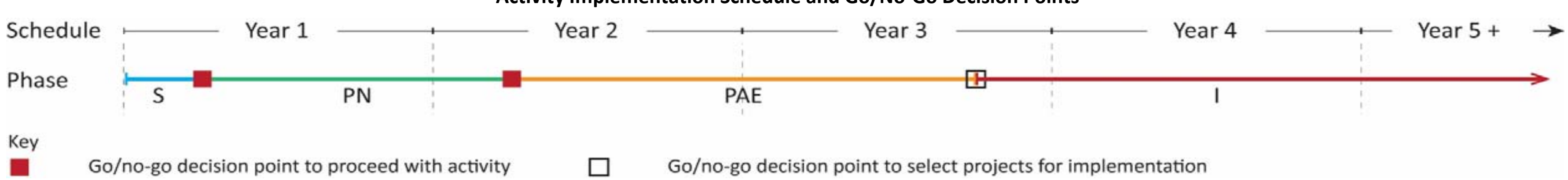


Exhibit 10

2020 OBMP Update - Activity EF

Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses AND Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality

Need and Objectives: Groundwater contaminants are present across the Chino Basin, new contaminants are being discovered, and water-quality regulations are evolving and becoming more restrictive. These trends are limiting the beneficial use of groundwater and increasing the cost of the water supply. The objectives of Activity EF are to characterize the water-quality challenges across the Chino Basin and identify the most efficient means to address the water-quality challenges, including the potential for multi-benefit collaborative projects, to ensure that groundwater can be put to beneficial use.

Phase*	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ?
S	1 - Convene the Water Quality Committee, define objectives, and refine scope of work	Mutual understanding of the universe of water quality concerns of parties	Convene committee	Paragraph 41 of the Judgement provides for both water quantity and quality considerations to maximize the beneficial utilization of the Basin. If water quality is not effectively managed, the Parties may not be able to utilize their water rights, which could result in negative impacts to the basin. Effective management of water quality can only be accomplished through a systematic assessment of the emerging contaminant threats to the use of groundwater resource and a development of a plan to respond to those threats.
PN	2 - Develop and implement an initial emerging-contaminants monitoring plan	Data	Prepare monitoring plan; collect and compile data	
PN	3 – Perform a water quality assessment and prepare a scope to develop and implement a *Groundwater Quality Management Plan*	Understanding of scale of problem; scope/cost to evaluate project alternatives; long-term monitoring plan	Perform characterization	
PAE	4 – Develop planning, screening, and evaluation criteria 5 – Identify and describe potential projects for evaluation 6 – Conduct a reconnaissance-level study for the proposed projects 7 – Prepare the *Groundwater Quality Management Plan*	Conceptual design and operating plans for project alternatives Understanding of cost to manage Chino Basin groundwater quality with and without collaborative projects Management plan to document project implementation plan and supporting info	Technical support role to evaluate project alternatives and characterize potential for MPI (if necessary) Technical support role to prepare the *Groundwater Quality Management Plan*	
I	8 – Plan, design, and build water quality management projects	New groundwater quality improvement projects	None	No

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

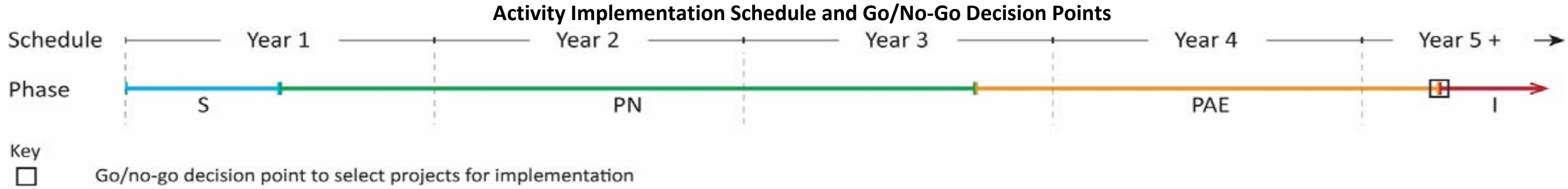


Exhibit 11

2020 OBMP Update - Activity K:

Develop a management strategy within the salt and nutrient management plan to ensure the ability to comply with the dilution requirements for recycled water recharge

Need and Objectives: The Watermaster and IEUA implement a recycled water recharge program to improve supply reliability. The Maximum Benefit SNMP requires that the recharge be diluted with other sources of low-salinity water to comply with Basin Plan Objectives. If sufficient dilution supplies are not available to comply with the dilution metric, treatment of recycled water, or other salt offset program will be required by the Regional Board. The objective of this activity is to determine if compliance with the Maximum Benefit SNMP recycled water recharge dilution requirements can be achieved under existing management plans, and if not, to develop a plan to achieve compliance.

Phase	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements ?
S/PN	1 – Prepare projection to evaluate compliance with recycled water dilution requirements 5 – Periodically reevaluate compliance with dilution requirements	Understanding of ability to comply with the TDS and nitrate dilution requirements in the SNMP (near-term and long-term)	Perform technical work in collaboration with IEUA	Yes. Watermaster and IEUA have already begun this project and are required to complete it by the Regional Board to obtain a revised recycled water compliance program related to total dissolved solids concentrations. If approved, the Regional Board will require the study to be updated every five years to re-evaluate the need for revised compliance strategies.
PAE	2 – Identify alternative compliance strategies 3 – Evaluate alternative compliance strategies	Conceptual design, operating plans, and costs of project alternatives Report to document compliance plan and supporting info	Technical support role to IEUA to evaluate hydrogeologic impacts of project alternatives	
I	4 – Implement the selected compliance strategy	Compliance project (or other compliance action)	Level of support depends on the compliance action	

**Phase Descriptions: S = Scoping   PN = Evaluate need for project   PAE = Project alternative evaluation   I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

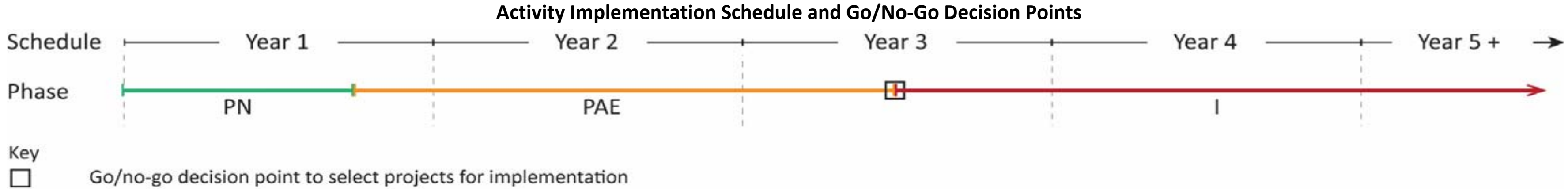


Exhibit 12

2020 OBMP Update - Activity L

Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance

Need and Objectives: Watermaster conducts data-collection programs and prepares reports and data deliverables to comply with regulations, to fulfill its obligations under its agreements and Court orders, to comply with its requirements under CEQA, and to assess the performance of the evolving OBMP IP, including the 2020 OBMP Update. These monitoring and reporting efforts are described in the Scoping Report, and will need to continue. The objective of Activity L is to refine the monitoring and reporting requirements of Watermaster to ensure that the objectives of each requirement are being met efficiently at a minimum cost.

Phase*	Task	Outcomes	Watermaster Role	Are these outcomes necessary for Watermaster to Administer the Physical Solution or Comply with Other Requirements?
S, PN	1 – Convene Monitoring and Reporting Committee and prepare the *Monitoring and Reporting Work Plan*	Understanding of all monitoring/reporting programs *Monitoring and Reporting Work Plan* *Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs*	Convene committee Prepare work plan	No, however, monitoring and reporting are required to implement the Judgment and comply with regulations and Watermaster obligations. Since the beginning of OBMP implementation, Watermaster staff and engineer have continually refined the monitoring and reporting efforts to meet all requirements and achieve efficiencies and will continue to do so. This activity continues these refinement efforts in closer collaboration with the parties.
I	2 – Implement recommendations in *Monitoring and Reporting Work Plan*	Revisions to Watermaster's non-discretionary monitoring and reporting programs Future updates to the *Monitoring and Reporting Work Plan*	Perform technical demonstrations to gain approval for revisions to the monitoring/reporting program Update work plan, when necessary	
PN, I	3 – (recurring future task) – Bi-Annual review of scope of work and cost to implement the *Monitoring and Reporting Work Plan* in the subsequent fiscal year	Update to *Monitoring and Reporting Work Plan* A scope of work and budget for the subsequent fiscal year	Update the work plan Prepare scope and budget recommendation for subsequent year	

**Phase Descriptions: S = Scoping PN = Evaluate need for project PAE = Project alternative evaluation I = Implementation*

Activity Implementation Schedule and Go/No-Go Decision Points

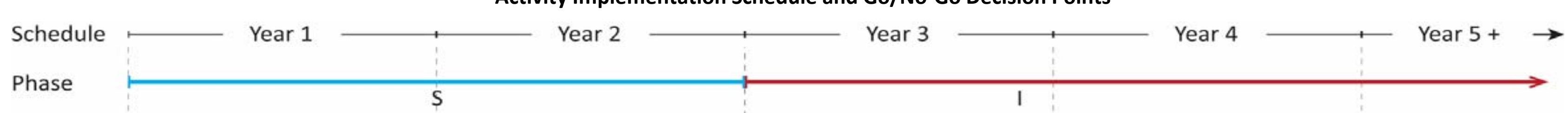


Exhibit 13
Nexus of the 2020 OBMP Update Activities to the 2000 OBMP Program Elements

2000 OBMP Program Elements (PEs)	**2020 OBMP Update Activities**						
	A - Increase Recharge	**B** - Optimize Storage and Recovery	**CG** - Regional Conveyance	**D** - Maximize RW Reuse	**EF** - Water Quality Mgmt.	**K** - Plan for SNMP Dilution Compliance	**L** - Monitoring
1 - Monitoring							⚓
2 - Recharge Program	⚓	●					●
3 - Impaired Areas		●			●	●	●
4 - Subsidence Mgmt.	●	●	●				●
5 - Supplemental Water		●	⚓	⚓	●		●
6 - Water Quality	●	●	●	●	⚓	●	●
7 - SNMP				●		⚓	●
8 – Storage Mgmt. Plan		●					●
9 – S&R Programs	●	⚓	●				●

⚓ Direct relationship between an activity and a PE (i.e. the activity and the PE have similar or identical objectives and thus the activity can be integrated into the existing PE)

● Indirect relationship between an activity and a PE (i.e. the activity has the potential to provide benefits to PEs)

Exhibit 14
Status of Compliance with the Chino Basin Maximum-Benefit Commitments

Description of Commitment	Compliance Date – as soon as possible, but no later than	Status of Compliance
1. Surface Water Monitoring Program[1] a. Submit draft Monitoring Program to Regional Board b. Implement Monitoring Program c. Submit Draft Revised Monitoring Program to Regional Board d. Implement Revised Monitoring Program e. Submit Draft Revised Monitoring Program(s) (subsequent to that required in "c", above) to Regional Board f. Implement Revised Monitoring Program(s) g. Annual data report submittal	a. January 23, 2005 b. Within 30 days from the date of Regional Board approval of the monitoring plan c. 15 days from 2012 Basin Plan Amendment (BPA) approval d. Upon Regional Board approval e. Upon notification of the need to do so from the Regional Board Executive Officer and in accordance with the schedule prescribed by the Executive Officer f. Upon Regional Board approval g. April 15th	a. Draft work plan submitted to the Regional Board on January 23, 2005 b. Monitoring plan initiated prior to Regional Board approval c. Draft work plan submitted to the Regional Board on February 16, 2012, six days after 2012 BPA approval d. Revised monitoring program began in December 2012 after the BPA was approved by the Office of Administrative Law on December 6, 2012 e. No revisions requested by the Regional Board f. n/a g. All annual reports submitted by April 15 of each year since 2006
2. Groundwater Monitoring Program[1] a. Submit Draft Monitoring Program to Regional Board b. Implement Monitoring Program c. Plan and schedule for demonstrating Hydraulic Control	a. January 23, 2005 b. Within 30 days from the date of Regional Board approval of the monitoring plan c. By December 31, 2013	a. Draft monitoring plan submitted to Regional Board on January 23, 2005 b. Monitoring program initiated prior to Regional Board approval c. Plan and schedule for demonstrating Hydraulic Control submitted in the 2014 Work Plan to the Regional Board on December 23, 2013

[1] The commitments related to surface water and groundwater monitoring were revised by a Basin Plan amendment approved by the Regional Board on February 10, 2012. The commitments and status of compliance shown in this table reflect the amended commitments for surface water and groundwater monitoring.

Exhibit 14
Status of Compliance with the Chino Basin Maximum-Benefit Commitments

Description of Commitment	Compliance Date – as soon as possible, but no later than	Status of Compliance
d. Implement Hydraulic Control demonstration e. Submit Draft Revised Monitoring Program(s) (subsequent to that required in "a", above) to Regional Board f. Implement revised monitoring plans (s) g. Annual data report submittal	d. Upon Regional Board approval e. Upon notification of the need to do so from the Regional Board Executive Officer and in accordance with the schedule prescribed by the Executive Officer f. Upon Regional Board approval g. April 15th	d. Hydraulic Control demonstration reported in all annual reports e. No revisions requested by Regional Board f. n/a g. All annual reports submitted by April 15 of each year
3. Chino Desalters a. Chino-I Desalter expansion to 10 mgd b. Chino-II Desalter construction to 10 mgd capacity	a. Prior to the recharge of recycled water b. Recharge of recycled water allowed once award of contract and notice to proceed issued for construction of desalter treatment plant	a. Chino-I Desalter expansion to about 14 mgd was completed in April 2005 and operation began in October 2005; recycled water recharge began in July 2005. b. Contract for Chino-II Desalter awarded in early 2005; construction was completed to a capacity of 15 mgd, and the facility went online in June 2006.
4. Submittal of future desalters plan and schedule	October 1, 2005 Implement plan and schedule upon Regional Board approval	Several plans for desalter expansion have been submitted to the Regional Board since 2005. The capacity of the constructed desalter wells in 2015 was about 27 mgd (about 30,000 afy). Watermaster and the IEUA submitted a plan to the Regional Board on June 30, 2015 to construct three additional wells to achieve the ultimate capacity of 36 mgd (40,000 afy), per the Peace and Peace II Agreements. The first two wells are constructed and began operating in 2018. The construction of the the third well is anticipated to begin in late 2019.

Exhibit 14
Status of Compliance with the Chino Basin Maximum-Benefit Commitments

Description of Commitment	Compliance Date – as soon as possible, but no later than	Status of Compliance
5. Recharge facilities (17) built and in operation	June 30, 2005	Watermaster and the IEUA partnered with the San Bernardino County Flood Control District and the Chino Basin Water Conservation District for completion of the Chino Basin Facilities Improvement Program to construct and/or improve eighteen recharge sites. There are currently 17 basins in the Chino Basin Groundwater Recharge Program.
6. Submittal of IEUA wastewater quality improvement plan and schedule	60 days after agency-wide, 12-month running average effluent TDS quality equals or exceeds 545 mgl for 3 consecutive months, or after agency-wide, 12-month running average TIN equals or exceeds 8 mgl in any month Implement plan and schedule upon approval by Regional Board	These threshold events have not occurred; therefore, a wastewater quality improvement plan has not been submitted
7. Recycled water will be blended with other recharge sources such that the volume-weighted, 5-year running average TDS and nitrate-nitrogen concentrations of recharge are equal to or less than the maximum benefit water quality objectives. a. Submit a report that documents the location, amount of recharge, and TDS and nitrogen quality of storm water recharge before the OBMP recharge improvements were constructed and what is projected to occur after the recharge improvements are completed.	Compliance must be achieved by the end of the 5th year after initiation of recycled water recharge operations. a. Prior to initiation of recycled water recharge	a. No documentation of water quality data or quantity for storm water prior to OBMP initiation exists. Storm water has been monitored for flow, TDS, and nitrogen since 2005.

Exhibit 14
Status of Compliance with the Chino Basin Maximum-Benefit Commitments

Description of Commitment	Compliance Date – as soon as possible, but no later than	Status of Compliance
b. Submit documentation of the amount and TDS and nitrogen quality of all sources of recharge and recharge locations. For storm water recharge used for blending, submit documentation that the recharge is the result of OBMP enhanced recharge facilities.	b. Annually, by April 15th, after initiation of construction of basins/other facilities to support enhanced storm water recharge	b. The volume-weighted, 5-year running average TDS and nitrate-nitrogen concentrations of Chino Basin recharge are less than the maximum-benefit water quality objectives
8. Hydraulic Control Failure a. Plan and schedule to correct loss of Hydraulic Control b. Achievement and maintenance of Hydraulic Control c. Mitigation plan for temporary failure to achieve/maintain Hydraulic Control	a. 60 days from Regional Board finding that Hydraulic Control is not being maintained b. In accordance with plan and schedule approved by the Regional Board c. By January 23, 2005	a. No mitigation plan and schedule for the loss of Hydraulic Control has been requested. b. Hydraulic Control has been achieved to the east of Chino-I Desalter Well 20. Groundwater model estimates published in 2015 indicate that production at the CCWF will achieve Hydraulic Control in the west to *de minimis* levels (<1,000 afy of groundwater flow past the CCWF well field to the Prado Basin Management Zone). Full production at the CCWF was achieved in 2016. Watermaster and the IEUA submitted a plan on June 30, 2015 to the Regional Board to construct three additional wells to achieve the ultimate Desalter capacity of 40,000 afy. Construction of two wells is completed and they began operating in 2018. Construction of the third well is anticipated to begin in late 2019.

Exhibit 14
Status of Compliance with the Chino Basin Maximum-Benefit Commitments

Description of Commitment	Compliance Date – as soon as possible, but no later than	Status of Compliance
		c. Plan submitted to the Regional Board on March 3, 2005. No mitigation action has been triggered.
9. Ambient groundwater quality determination	July 1, 2005 and every three years thereafter	Watermaster and the IEUA have participated in the regional triennial ambient water quality determinations coordinated through Basin Monitoring Program Task Force, administered through the Santa Ana Watershed Project Authority. Watermaster and the IEUA provide their fair share of funds and substantial groundwater data for this effort.

Exhibit 15

Limitations, Compliance Metrics, and Compliance Actions for the Chino Basin Maximum-Benefit Commitments

Source Waters with Water Quality Limitations in the Chino Basin SNMP	Water Quality Limitation	Compliance Metric	Action Limit	Required Compliance Action when Compliance Metric Exceeds the Action Limit
IEUA Recycled Water (Commitment 6)	TDS: 550 mgl	The agency-wide, 12-month running-average concentration	When the compliance metric exceeds 545 mgl for three consecutive months	Submit to the Regional Board for approval a plan and schedule to comply with the water quality limitations within 60 days.
IEUA Recycled Water (Commitment 6)	TIN: 8 mgl	The agency-wide, 12-month running-average concentration	When the compliance metric exceeds 8 mgl in any month	Submit to the Regional Board for approval a plan and schedule to comply with the water quality limitations within 60 days.
Combined water sources used for managed recharge: storm, imported and recycled waters (Commitment 7)	TDS: 420 mgl Nitrate: 5 mgl	The five-year, volume-weighted running-average concentration of all sources of managed recharge	TDS: 420 mgl Nitrate: 5 mgl	Prepare a salt offset plan to mitigate salt loading from recharge greater than 420 mgl. Offsets could include desalting of recycled water or groundwater, or increased recharge of low-TDS waters.
Groundwater (Commitment 9)	TDS: 420 mgl	The volume-weighted concentration of groundwater in the Chino North GMZ (computed every three years)	TDS: 420 mgl	Reduce the TDS concentration of IEUA recycled water to comply with the maximum-benefit TDS objective or prepare a salt offset plan to mitigate loading from the use of recycled water than 420 mgl.
Groundwater (Commitment 9)	Nitrate: 5 mgl	The volume-weighted concentration of groundwater in the Chino North GMZ (computed every three years)	n/a	This action limit was already exceeded when the objective was established. So long as all other maximum benefit commitments are met, no compliance action is required.

Exhibit 16

Ending Balances in Managed Storage in the Chino Basin[1]

(af)

Fiscal Year ending June 30	Appropriative Pool				Overlying Non-Agricultural Pool			Total Managed Storage by Parties	Dry Year Yield Program Storage	Total Managed Storage
	Carryover (1)	Excess Carryover (2)	Local Supplemental Storage (3)	Subtotal (4)	Carryover (5)	Excess Carryover (6)	Subtotal (7)	(8) = (7) + (4)	(9)	(10) = (9) + (8)
2000	28,911	170,342		199,253	6,541	31,031	37,572	236,825	0	236,825
2001	15,940	77,907	92,813	186,660	5,301	32,330	37,631	224,291	0	224,291
2002	13,521	70,103	87,801	171,425	5,285	33,727	39,012	210,437	0	210,437
2003	18,656	71,329	81,180	171,165	6,743	36,850	43,593	214,758	7,738	222,496
2004	21,204	70,503	80,963	172,670	7,177	40,881	48,058	220,728	26,300	247,028
2005	21,289	76,080	88,849	186,218	7,227	45,888	53,115	239,333	38,754	278,087
2006	32,062	56,062	86,170	174,294	7,227	49,178	56,405	230,699	58,653	289,352
2007	34,552	50,895	83,184	168,631	7,084	51,476	58,560	227,191	77,116	304,307
2008	41,626	83,962	81,520	207,108	6,819	45,248	52,067	259,175	74,877	334,052
2009	42,795	101,908	79,890	224,593	6,672	46,600	53,272	277,865	34,494	312,359
2010	41,263	120,897	90,133	252,293	6,934	47,732	54,666	306,959	8,543	315,502
2011	41,412	146,074	98,080	285,566	6,959	49,343	56,302	341,868	0	341,868
2012	42,614	209,981	116,138	368,733	6,914	13,993	20,907	389,640	0	389,640
2013	39,413	225,068	116,378	380,859	7,073	15,473	22,546	403,405	0	403,405
2014	41,708	224,496	123,484	389,688	6,478	12,812	19,290	408,978	0	408,978
2015	40,092	239,517	127,994	407,603	6,823	12,225	19,048	426,651	0	426,651
2016	39,733	248,013	131,522	419,267	7,195	9,949	17,144	436,411	0	436,411
2017	38,340	260,682	143,552	442,575	7,226	8,292	15,519	458,093	6,315	464,408
2018	34,582	254,221	155,018	443,821	7,198	10,775	17,973	461,795	41,380	503,174
2019	38,605	279,033	166,406	484,044	7,227	12,004	19,231	503,275	45,969	549,244

1 -- WEI. (2019). Draft Storage Management Plan.

Exhibit 17

Implementation Actions for the 2020 Optimum Basin Management Program Update by Program Element

Implementation Actions for the Next 20 Years by Program Element	Action Added in 2000* or 2020?	Schedule (Yr 1-3, 4-20, or 1-20)	Is the Action Required by Watermaster to Administer the Physical Solution or Comply with Other Regulatory or Court Requirements?	
			Yes/No	Basis
Program Element 1 - Develop and Implement Comprehensive Monitoring Program				
Watermaster will continue to conduct the required monitoring and reporting programs, including collection of: groundwater production, groundwater level, groundwater quality, ground level, surface water, climate, water supply planning, biological, and well construction/destruction monitoring data.	2000*	Years 1-20	Yes	This action included in the 2000 OBMP IP is required by the July 2000 Court Order to implement the Peace Agreement. The monitoring requirements have evolved over time. The requirements are described in Table 2 of the OBMP Update Report, which lists each Watermaster monitoring and reporting program and the associated entity (e.g. Court, Regional Board, etc.) requiring each program.
Perform review and update of Watermaster's regulatory and Court-ordered monitoring and reporting programs and document in a work plan: *OBMP Monitoring and Reporting Work Plan.*	2020	Years 1-3	No	These actions will allow the Parties to offer more direct input in the implementation of the required monitoring programs, but it is not necessary for Watermaster to convene this process to comply with the monitoring requirements. Watermaster annually reviews ongoing monitoring to achieve efficiency.
Perform periodic review and update of the *OBMP Monitoring and Reporting Work Plan* (or other guidance documents developed by Watermaster) and modify the monitoring and reporting programs, as appropriate.	2020	Years 4-20	No	
Program Element 2 - Develop and Implement Comprehensive Recharge Program				
Continue to convene the Recharge Investigations and Projects Committee.	2000	Years 1-20	Yes	These actions included in the 2000 OBMP IP are required by the July 2000 Court Order to implement the Peace Agreement. The Peace II Agreement and the Special Referee's December 2007 Report further establish the requirement and need for the recharge program. In its December 2007 Order, the Court ordered the implementation of the Peace II Agreement.
Complete the 2023 Recharge Master Plan Update (RMPU).	2000*	Years 1-3	Yes	
Implement recharge projects based on need and available resources.	2000	Years 1-20	Yes	
Update the RMPU no less than every five years (2028, 2033, 2038).	2000	Years 4-20	Yes	
Program Element 3 - Develop and Implement a Water Supply Plan for Impaired Areas				
n/a				As described in Section 3.2.3.2 of the 2020 OBMP Update report, there are no separate implementation actions for PE3 in the 2020 OBMP. The ongoing operation of the Chino Basin Desalters, which were the subject of the implementation actions of PE 3 in the 2000 OBMP is now part of PE 7 to Develop and Implement a Salt Management Program.
Program Element 4 - Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1				
Implement Watermaster's Subsidence Management Plan, and adapt it as necessary.	2000*	Years 1-20	Yes	These actions included in the 2000 OBMP are required by the July 2000 Court Order to implement the Peace Agreement. The Peace II Agreement established further requirements for the continued recharge in MZ-1 through the term of the Peace Agreement.
Watermaster will arrange for the physical recharge of at least 6,500 any of Supplemental Water in MZ-1 as an annual average. Watermaster may re-evaluate the minimum annual quantity of Supplemental Water recharge in MZ-1 and may increase this quantity through the term of the Peace Agreement.	2000*	Years 1-20	Yes	

Exhibit 17

Implementation Actions for the 2020 Optimum Basin Management Program Update by Program Element

Implementation Actions for the Next 20 Years by Program Element	Action Added in 2000* or 2020?	Schedule (Yr 1-3, 4-20, or 1-20)	Is the Action Required by Watermaster to Administer the Physical Solution or Comply with Other Regulatory or Court Requirements?	
			Yes/No	Basis
Program Element 5 - Develop and Implement Regional Supplemental Water Program				
The IEUA will maximize the reuse of its recycled water in the Chino Basin.	2000*	Years 1-20	Yes	Pursuant to the Basin Plan, IEUA and Watermaster are required to maximize recycled water reuse in the Chino-North GMZ consistent with the Maximum Benefit SNMP.
The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish or expand future recycled water planning efforts to maximize the reuse of all available sources of recycled water.	2020	Years 1-20	No	Although these actions optimize the management of all available recycled water supplies to achieve water supply reliability, they are not required by Watermaster to administer the Physical Solution or other regulatory requirements. These implementation actions are included as part of the 2020 OBMP Update to complement regional planning efforts, not to duplicate them.
Watermaster will support the IEUA, the TVMWD, the WMWD, and/or others in their efforts to maximize recycled water reuse to ensure these efforts are integrated with Watermaster's groundwater and salinity management efforts.	2020	Years 1-20	No	
The IEUA, the TVMWD, the WMWD, and/or other Party acting as a coordinating agency will establish or expand future integrated water resources planning efforts to address water supply reliability for all Watermaster Parties.	2020	Years 1-20	No	Although these actions optimize the management of all available water supplies to achieve water supply reliability, they are not required by Watermaster to administer the Physical Solution or other regulatory requirements. These implementation actions are included as part of the 2020 OBMP Update to complement regional planning efforts, not to duplicate them.
Watermaster will support the IEUA, the TVMWD, the WMWD, and/or others in their efforts to improve water supply reliability to ensure those efforts are integrated with Watermaster's groundwater management efforts.	2020	Years 1-20	No	
Program Element 6 - Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management				
Re-convene the water quality committee and meet periodically to update groundwater quality management priorities.	2000*	Years 1-3	Yes	Paragraph 41 of the Judgment states: "Watermaster Control. Watermaster, with the advice of the Advisory and Pool Committees, is granted discretionary powers in order to develop an optimum basin management program for Chino Basin, including both water quantity and quality considerations. Withdrawals and supplemental water replenishment of Basin Water, and the full utilization of the water resources of Chino Basin, must be subject to procedures established by and administered through Watermaster with the advice and assistance of the Advisory and Pool Committees composed of the affected producers. Both the quantity and quality of said water resources may thereby be preserved and the beneficial utilization of the Basin maximized." (Pgs. 19-20 of the Restated Judgment) If water quality is not considered and effectively managed, the Parties may not be able to utilize their water rights, which could result in negative impacts to the basin, such as reductions in net recharge, loss of hydraulic control, and movement of contaminant plumes. Effective management of water quality in the Basin to preserve maximum beneficial use can only be accomplished through a systematic assessment of the emerging contaminant threats to the use of groundwater resources, and thoughtfully preparing a plan to respond to those threats.
Develop and implement an initial emerging contaminants monitoring plan.	2020	Years 1-3	Yes	
Prepare a water quality assessment of the Chino Basin to evaluate the need for a *Groundwater Quality Management Plan* and prepare a long-term emerging contaminants monitoring plan.	2020	Years 1-3	Yes	
Develop and implement a *Groundwater Quality Management Plan* and periodically update it.	2020	Years 4-20	Yes	
Implement long-term emerging contaminants monitoring plan.	2020	Years 4-20	Yes	
Continue to conduct investigations to assist the parties and/or the Regional Board in accomplishing mutually beneficial objectives as needed.	2000	Years 1-20	Yes	This action included in the 2000 OBMP is required by the July 2000 Court Order to implement the Peace Agreement. Recommendations for investigations will be made to Watermaster by the Water Quality Committee.
Continue to support the Parties in identifying funding from outside sources to finance cleanup efforts.	2000	Years 1-20	Yes	This action included in the 2000 OBMP is required by the July 2000 Court Order to implement the Peace Agreement. Requests for support will be made to Watermaster by the Water Quality Committee.
Implement projects of mutual interest.	2000	Years 1-20	No	The implementation of projects is not required by the 2000 OBMP IP, however Watermaster is required to support the Parties, as requested by the Committee, and as appropriate.

Exhibit 17
Implementation Actions for the 2020 Optimum Basin Management Program Update by Program Element

Implementation Actions for the Next 20 Years by Program Element	Action Added in 2000* or 2020?	Schedule (Yr 1-3, 4-20, or 1-20)	Is the Action Required by Watermaster to Administer the Physical Solution or Comply with Other Regulatory or Court Requirements?	
			Yes/No	Basis
Program Element 7 - Develop and Implement Salt Management Plan				
Continue to implement the maximum benefit salt and nutrient management plan pursuant to the Basin Plan.	2000*	Years 1-20	Yes	Watermaster and IEUA must perform these actions pursuant to the maximum benefit SNMP in the Basin Plan.
Complete the 2020 update of TDS and nitrate projections to evaluate compliance with maximum benefit salt and nutrient management plan, and, if necessary, based on the outcome, prepare a plan and schedule to implement a salt offset compliance strategy.	2020	Years 1-3	Yes	Watermaster and IEUA have already begun this project and are required to complete it by the Regional Board to obtain a revised recycled water compliance program related to total dissolved solids concentrations.
Starting in 2025 and every five years thereafter, update water quality projections to evaluate compliance with the maximum benefit salt and nutrient management plan.	2020	Years 4-20	Yes	Watermaster and IEUA will be required to perform these actions pursuant to an anticipated amendment to the maximum benefit SNMP in the Basin Plan.
Program Element 8/9 - Develop and Implement Groundwater Storage Program *and* Develop and Implement Storage and Recovery Programs				
Complete and submit to the Court the 2020 Safe Yield Recalculation.	2000*	Years 1-3	Yes	The 2000 OBMP IP identified the ten-year recalculation requirement, which is binding on Watermaster through the 2000 Court Order. Additionally, section 4.2 of the April 2017 Court Order that followed the 2015 Safe Yield Reset further establishes the date by which the next 10-year updates must occur (2020) and affirms the 10-year update frequency.
Complete and submit to the Court the 2020 Storage Management Plan (SMP).	2020	Years 1-3	Yes	Paragraph 41 of the Judgment requires "...procedures to be established and administered through Watermaster with the advice and assistance of the Advisory and Pool Committees for the withdrawals and supplemental water replenishment of Basin water..." The SMP in the 2000 OBMP is insufficient to meet the needs of the Parties as storage already exceeds the limits in the established procedures. A new SMP is required to issue storage agreements as of July 1, 2020. And, the CEQA coverage for the existing SMP expires in July 2021.
Develop a *Storage and Recovery Master Plan* to support the design of optimized storage and recovery programs that are consistent with the 2020 Storage Management Plan and provide the Watermaster with criteria to review, condition, and approve applications in a manner that is consistent with the Judgment and the Peace Agreement.	2020	Years 1-3	Yes	Section 5.2.c.iv.(b) of the Peace Agreement states that "Watermaster shall prioritize its efforts to regulate and condition the storage and recovery of water developed in a Storage and Recovery Program for the mutual benefit of the Parties to the Judgment and give first priority to Storage and Recovery Programs that provide broad mutual benefits." Watermaster must document the basis by which it will review, condition, and approve applications in a manner that is predictable, uniform, and consistent with the Peace Agreement and the 2020 SMP. A master plan is the most efficient process to do this.
Assess losses from storage accounts based on the findings of the 2020 Safe Yield Recalculation.	2000*	Years 1-3	Yes	Section 5.2.b.xii of the Peace Agreement requires that Watermaster shall set the annual rate of loss from Local Storage for parties to the Judgment at zero through 2005. Thereafter, the rate of loss from Local Storage for parties to the Judgment will be 2% until recalculated based upon the based available scientific information. Losses will be deducted annually from each party to the Judgment's storage account. The loss rate is assessed as part of the Safe Yield recalculation.
Update the Storage Management Plan in 2025 and every five years thereafter, and when: the Safe Yield is recalculated, Watermaster determines a review and update is warranted based new information and/or the needs of the parties or the basin, and at least five years before the aggregate amount of managed storage by the parties is projected to fall below 340,000 af.	2020	Years 4-20	Yes	The 2020 SMP is based on present planning projections and technical understanding of the basin. This information can change over time and the limits established in the 2020 SMP must be revisited from time to time to ensure it meets the needs of the Parties. These triggers for updating the SMP are defined in the 2020 SMP.
Perform Safe Yield recalculation every 10 years.	2000	Years 4-20	Yes	See above basis for the 2020 Safe Yield recalculation.
Update the storage loss rate following each recalculation of Safe Yield and during periodic updates of the SMP.	2020	Years 4-20	Yes	See above basis for assessing losses based on the 2020 Safe Yield recalculation. The loss rate may also be evaluated in future SMP updates.

For the 2000 OBMP implementation actions annotated with a "", the description of the action has been modernized to reflect current terminology, reports, and requirements established after the 2000 OBMP was finalized.

Appendix A

White Paper – 2020 Update to the Chino Basin Optimum Basin Management Program

White Paper – 2020 Update to the Chino Basin Optimum Basin Management Program

Introduction

This white paper describes the Optimum Basin Management Program (OBMP) that was developed in 2000 and updated in 2007, the efficacy of the OBMP, and the need to update it. This paper is organized as follows:

- Existing OBMP – this section describes the history and accomplishments of the OBMP that was developed in 2000 and updated in 2007.
- Need to Update the OBMP – this section summarizes the need to update the OBMP.
- Benefits from Updating the OBMP – this section summarizes the benefits from updating the OBMP.
- Process to Update the OBMP – this section summarizes the process to update the OBMP.

Existing OBMP

The Chino Basin Judgment gave Watermaster the authority to develop an OBMP for the Chino Basin, including both water quantity and quality considerations. Watermaster, with direction from the Court, began the development of the OBMP in 1998 and completed it in July 2000. The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders, described the physical state of the groundwater basin, developed a set of management goals, identified impediments to those goals, developed a series of actions that could be taken to remove those impediments and achieve the management goals, and developed agreements to implement the OBMP. The OBMP goals and the activities to achieve them were stated in the OBMP Phase I report as follows[1]:

- "Goal 1 - Enhance Basin Water Supplies. This goal applies not only to local groundwater but also to all sources of water available for the enhancement of the Chino Groundwater Basin. The following activities enhance basin water supplies:
    - Enhance recharge of storm water runoff. Increasing the recharge of storm water in the basin will increase the water supplies in the Chino Basin. The relatively low TDS and nitrate concentrations of storm flow will improve groundwater quality.
    - Increase the recharge of recycled water. The recharge of recycled water above that required for replenishment obligations can be used for safe yield augmentation and/or conjunctive use.
    - Develop new sources of supplemental water. New sources of supplemental water, including surface and groundwater from other basins, can be used to meet Chino Basin area demands, reduce dependency on Metropolitan supplies, and improve drought reliability.

[1] See Optimum Basin Management Program, Phase 1 Report, August 1999, pages 3-2 to 3-4. Document is located here: http://www.cbwm.org/docs/engdocs/OBMP%20-%20Phase%20I%20(Revised%20DigDoc).pdf

- Promote the direct use of recycled water. Promoting the direct use of recycled water for non-potable uses will make more native groundwater available for higher-priority beneficial uses.
- Promote the treatment and use of contaminated groundwater. In some parts of the basin, groundwater is not produced because of contamination problems and thus the yield of the basin may be reduced. The yield of the basin can be maintained and enhanced by the production and treatment of these contaminated waters.
- Reduce groundwater outflow. Increasing groundwater production near the Santa Ana River will increase the streambed percolation of the Santa Ana River into the groundwater basin and reduce groundwater outflow from the basin and thereby increase the supply of groundwater in the basin.
- Re-determine safe yield. Recent studies suggest that the safe yield may be greater than the 140,000 acre-ft as stated in the Judgment. The activities listed above will cause the yield to increase further. Continuing to operate the basin at 140,000 acre- ft/yr will cause groundwater in the basin to be lost to the Santa Ana River. The safe yield will be re-determined on an as-needed basis to maximize the current yield and to cause future increases in yield.

- Goal 2 - Protect and Enhance Water Quality. This goal will be accomplished by implementing activities that capture and dispose of contaminated groundwater, treat contaminated groundwater for direct high-priority beneficial uses, and encourage better management of waste discharges that impact groundwater. The following activities will protect and enhance water quality:
  - Treat contaminated groundwater to meet beneficial uses. Groundwater in some parts of the basins is not produced because of contamination problems. Groundwater quality can be protected by intercepting contaminants before they spread. Intercepted groundwater could be treated and used directly for high priority beneficial uses or injected back into the aquifer.
  - Monitor and manage the basin to reduce contaminants and to improve water quality. Actively assisting and coordinating with the Regional Board, the EPA, and other regulatory agencies in water quality management activities would help improve water quality in the basin.
  - Manage salt accumulation through dilution or blending and the export of salt.
  - Address problems posed by specific contaminants.

- Goal 3 - Enhance Management of the Basin. This goal will be accomplished by implementing activities that will lead to the optimal management of the Chino Basin. The following activities will protect and enhance the management of the basin:
  - Develop policies and procedures that will encourage stable, creative, and fair water resources management in the basin.
  - Optimize the use of local groundwater storage. Policies and procedures for local storage, cyclic storage, and other types of storage accounts will be created to maximize drought protection and improve water quality, and to create an

efficient system to transfer water from producers with surplus water to producers that need water.
    - Develop and/or encourage production patterns, well fields, treatment and water transmission facilities, and alternative water supply sources to ensure maximum and equitable availability of groundwater and to minimize land subsidence. Develop conjunctive-use programs with others to optimize the use of the Chino Basin for in-basin producers and the people

- Goal 4 - Equitably Finance the OBMP. This goal is based on the following principles:
    - The primary source of revenue to finance the implementation will be consumers of Chino Basin groundwater.
    - Consumers in the Chino Basin must be treated equitably by passing the cost of the OBMP on a per acre-foot basis or by other methods, based on formulas to be determined.
    - Financial incentives and disincentives will be established to assure that existing groundwater is pumped out of the basin and a higher quality of water is used to replenish the basin.
    - Opportunities for creativity will be provided to the producers so that they are motivated to use their assets and abilities in the implementation of the OBMP.
    - Recover value from utilization of storage of supplemental water and from rising water outflow."

The actions to remove the impediments to the OBMP goals were logically grouped into sets of coordinated activities called Program Elements. Each Program Element contains a list of definitive actions and an implementation schedule. The OBMP Implementation Plan consists of nine Program Elements. The relationship of the goals to the Program Elements is shown in the following table.

Relationship of Goals and Program Elements in the 2000 OBMP

Program Element	Goal 1 - Enhance Basin Water Supplies	Goal 2 - Protect and Enhance Water Quality	Goal 3 - Enhance Management of the Basin	Goal 4 - Equitably Finance the OBMP
Program Element 1. Develop and Implement Comprehensive Monitoring Program (Comprehensive Monitoring Program)	X	X	X	X
Program Element 2. Develop and Implement Comprehensive Recharge Program (Comprehensive Recharge)	X	X	X	X
Program Element 3. Develop and Implement a Water Supply Plan for Impaired Areas (Groundwater Desalting)	X	X	X	X
Program Element 4. Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1 (Land Subsidence Management)			X	X
Program Element 5. Develop and Implement Regional Supplemental Water Program (Recycled Water Reuse)	X	X	X	X
Program Element 6. Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management (Water Quality Management)	X	X	X	X
Program Element 7. Develop and Implement Salt Management Plan (Salt and Nutrient Management Plan)	X	X	X	X
Program Element 8. Develop and Implement Groundwater Storage Program (Groundwater Storage Management)	X	X	X	X
Program Element 9. Develop and Implement Conjunctive Use Program (Conjunctive Use)	X	X	X	X

Since October 2000, Watermaster, the Judgment parties, the IEUA, the TVMWD, and the WMWD have implemented most of the actions described in the Program Elements and the OBMP goals have been partially achieved. Some of the requirements and scope of the Program Elements have changed over time as impediments to the goals have been refined by new information, evolving technological and institutional challenges, and funding opportunities. The accomplishments from the implementation of the 2000 OBMP are summarized below.

Program Element 1. Develop and Implement Comprehensive Monitoring Program (Comprehensive Monitoring Program)

The objectives of this Program Element are to collect the data necessary to support the implementation of the other eight Program Elements and periodic updates to the state of the basin. The types of data collected include: groundwater data from wells (location, construction, lithology, pumping, water level and water quality); surface water (measuring location, discharge, recharge and water quality); ground level (vertical displacement from remote sensing, ground survey and extensometers, horizontal displacement from ground surveys); climatic data (precipitation from terrestrial stations, PRISM, NEXRAD, bias corrected and spatially disaggregated projections of future precipitation, evaporation, ET and temperature); land use and vegetation maps; normalized difference vegetation index mapping; facilities information (drainage maps, sewershed, water systems and facilities details); aerial photography; and LIDAR surveys. All these data are in stored in a relational database, GIS or other digital formats. The monitoring requirements have been reviewed annually and modified to ensure that the monitoring program delivered the minimum data required for OBMP implementation.

Program Element 2. Develop and Implement Comprehensive Recharge Program (Comprehensive Recharge)

The objectives of this Program Element include increasing stormwater recharge to offset the recharge lost due to channel lining, increase Safe Yield and to ensure that there will be enough supplemental water recharge capacity available to Watermaster to replenish overdraft. Recharge master plans were completed in 2001, 2013, and 2018. Watermaster and the IEUA implemented the 2001 recharge master plan and constructed recharge improvements that increased storm water recharge by about 9,000 afy. Watermaster and the IEUA completed a recharge master plan update in 2013 (2013 RMPU), and they are currently in the process of designing and constructing the recommended 2013 RMPU recharge projects. When completed in 2021, the 2013 RMPU projects will increase stormwater recharge by another 4,800 afy and recycled water recharge capacity by 7,100 afy. Finally, Watermaster and the IEUA completed a recharge master plan update in 2018 that recommended no new recharge projects. In the first 20 years of OBMP implementation, stormwater recharge will have increased about 13,800 afy, and supplemental water recharge capacity will have increased by 27,600 afy. One of the findings of the 2018 recharge master plan update is that Watermaster has enough supplemental water recharge capacity to it meet its replenishment obligations through wet-water recharge through 2050. The IEUA has increased the recharge of recycled water from about 500 afy in 2000 to about 16,000 afy in 2018.

Program Element 3. Develop and Implement a Water Supply Plan for Impaired Areas (Groundwater Desalting)

The objectives of this Program Element are to maintain and enhance the Safe Yield of the basin. The groundwater desalting program was designed to replace declining agricultural groundwater pumping in the southern part of the basin with new groundwater pumping to meet increasing municipal water demands in the same area. The new wells used in the groundwater desalting program were constructed in strategic locations to minimize groundwater outflow to the Santa Ana River and to increase the Santa Ana River recharge into the basin. In 2000, the groundwater desalting program included a 6,000 afy treatment plant and a series of wells constructed in the southern part of the Chino Basin near the Chino Airport. Under the OBMP, as of 2018, the desalting program has grown to two treatment plants and additional wells that in aggregate pump and treat about 30,000 afy degraded groundwater, and the program will reach the OBMP objective of 40,000 afy in 2019. The groundwater desalting program facilities are owned by the Chino Basin Desalter Authority (CDA) whose members include the Cities of Chino, Chino Hills, Ontario, and Norco; the Jurupa Community Services District; the Santa Ana River Water Company; the IEUA; and the WMWD.

Program Element 4 Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1 (Land Subsidence Management)

The objectives of this Program Element include the spatial and temporal characterization of land subsidence, identification of its causes, and, where appropriate, the development and implementation of a program to minimize or abate land subsidence. In the early 2000s, Watermaster constructed specialized monitoring wells to characterize land subsidence in the City of Chino. This work yielded two things: a successful voluntary management plan specific to certain wells located within a designated "Managed Area in the City of Chino; and a monitoring and investigative plan to characterize land subsidence throughout MZ1 and a part of MZ2. As of 2018, land subsidence monitoring is ongoing, and a focused effort is underway to develop a land subsidence management plan for the northwestern part of MZ1.

Program Element 5 Develop and Implement Regional Supplemental Water Program (Recycled Water Reuse)

The objective of this Program Element is to improve the regional conveyance and availability of imported and recycled waters throughout the basin. Since 2000, the IEUA has constructed and operated a recycled water conveyance system throughout the basin enabling it to provide recycled water to its member agencies. Recycled water deliveries grew from about 3,400 afy in 2000 to about 34,000 afy in 2017. The recycled water provided by the IEUA has replaced a like amount of groundwater and imported water that would have otherwise been used for non-potable purposes. Much of the post-2000 increase in supplemental water storage in the Chino Basin is attributable to the increased availability of recycled water. Recycled water is more reliable than imported water, and thus using it in lieu of imported water has improved the sustainability of the Chino Basin and water supply reliability. Improvements in the regional conveyance and availability of imported water were not achieved.

Program Element 6 Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management (Water Quality Management)

The objectives of this Program Element are the identification of water quality trends in the basin and the impact of the OBMP implementation on them, the determination of whether point and non-point contamination sources are being addressed by water quality regulators, and to collaborate with water quality regulators to identify and facilitate the cleanup of soil and groundwater contamination. Since 2000, Watermaster, through its own monitoring activities and the efforts of cooperating entities, has compiled surface and ground water quality and related data, assessed water quality trends, and periodically reported its findings to the Judgment parties. Watermaster has collaborated with the Regional Board in its efforts to work with dischargers to facilitate the cleanup of soil and groundwater contamination in the basin. The 2000 OBMP Implementation Plan identified the opportunities to use the Chino Desalters to assist in the remediation of the Chino Airport and South Archibald plumes, which, as of this writing, is coming to fruition.

Program Element 7 Develop and Implement Salt Management Plan (Salt and Nutrient Management Plan)

The objectives of this Program Element are to characterize current and future salt and nutrient conditions in the basin and to subsequently develop and implement a plan to manage them. Watermaster and the IEUA developed an innovative salt and nutrient management plan (SNMP) for the Chino Basin that created assimilative capacity for total dissolved solids (TDS) and that when combined with the planned new recharge of stormwater and imported water, groundwater desalting, achievement of Hydraulic Control, and monitoring, enabled the use of recycled water without treatment to reduce the TDS concentration in recycled water. The SNMP was initiated in 2004. Ambient TDS and nitrate concentrations continue to increase in the Chino Basin due to legacy agricultural activities and current irrigation practices.

Program Element 8 Develop and Implement Groundwater Storage Program (Groundwater Storage Management)

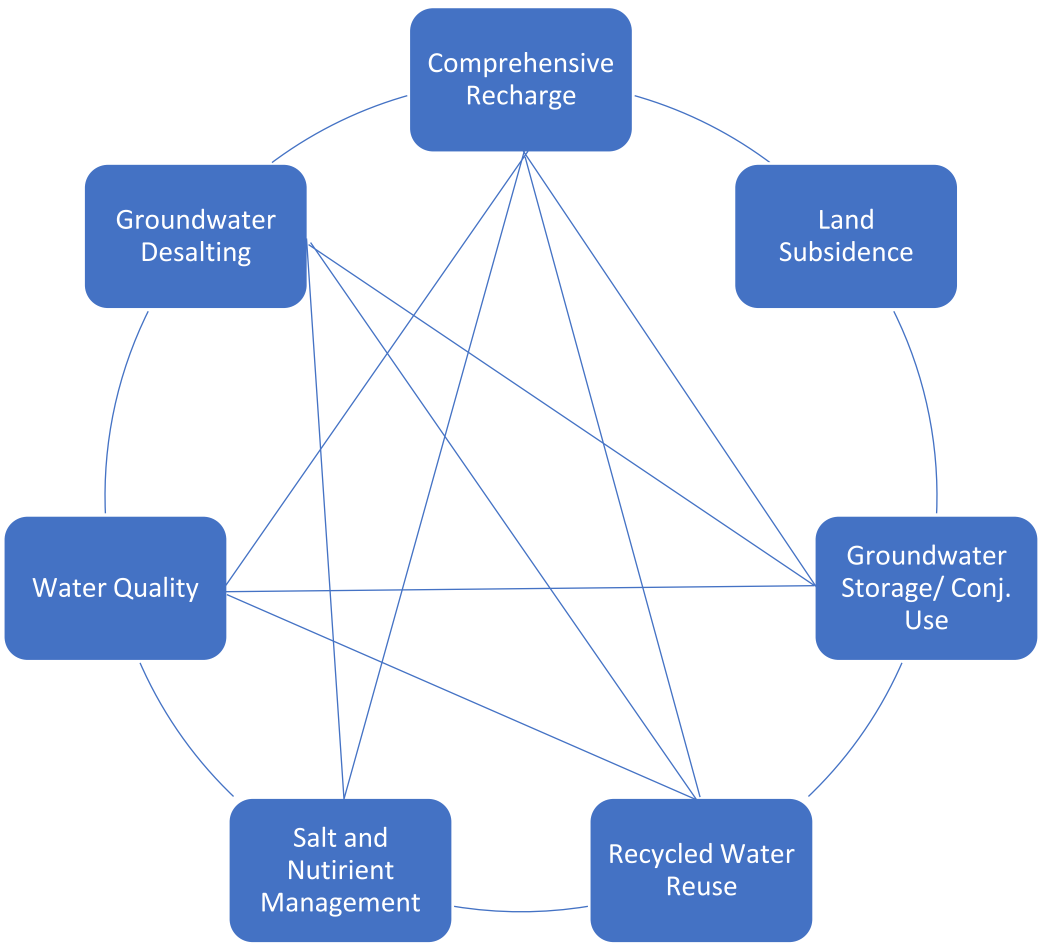
The objectives of this Program Element are to develop and implement a storage management program that is protective of water quality, prevents overdraft, and ensures equity among the Judgment parties. This Program Element also includes the recalculation of Safe Yield. The storage management plan in the OBMP implementation plan was implemented in 2000 and revised in 2016, raising the Safe Storage Capacity for managed storage from 500,000 af to 600,000 af through June 2021. Safe yield was recalculated in 2015 and, as of this writing, has not been approved by the Court. Losses from storage were initially assigned to zero through 2005, estimated at 2 percent from 2006 through 2017, and reduced to 0.07 percent thereafter with the achievement of Hydraulic Control. Watermaster conducted a Storage Framework Investigation in 2017 and 2018 to provide technical information to support the development of a new storage management plan in 2019. Technical work has commenced to recalculate the Safe Yield in 2020.

Program Element 9 Develop and Implement Conjunctive Use Program (Conjunctive Use)

The objective of this Program Element is to develop Storage and Recovery programs that will provide broad mutual benefit to the Judgment parties and reduce the cost of OBMP implementation. Watermaster, the IEUA, the TVMWD, the WMWD, and the Metropolitan Water District of Southern California (Metropolitan) implemented a 100,000 af storage program called the Dry-Year Yield Program (DYYP) in 2005. This program runs through 2028. Other than the DYYP, no Storage and Recovery programs have been implemented since 2000. IEUA is currently working to obtain a $207 million grant to develop and implement a Storage and Recovery program that will provide broad mutual benefit to the Judgment parties and state.

The 2000 OBMP Program Elements are highly related as is shown in the figure below. For example, the management activities associated with groundwater recharge impact land subsidence (a possible land subsidence management tool), groundwater storage and conjunctive use (recharge as a means to get water into storage), recycled water reuse (recharge as a means to get recycled and dilution water into the basin), and the salt and nutrient management plan (managed recharge must be blended to meet SNMP requirements). Furthermore, recharge impacts water quality directly, it has the potential to displace contaminant plumes, and future recharge increases with high quality storm and imported waters will be used to increase pumping rights and reduce future desalting requirements.

Relationship of the 2000 OBMP management activities



White Paper – 2020 Update to the Chino Basin Optimum Basin Management Program

Peace Agreements and CEQA

The 2000 OBMP and the Peace Agreement were completed in 1999 and 2000, respectively. The operable features of the OBMP were incorporated into the OBMP Implementation Plan. The OBMP Implementation Plan is Exhibit B to the Peace Agreement. The Peace Agreement was reviewed in a programmatic environmental impact report (PEIR), completed by the IEUA in July 2000.

Subsequent to the PEIR, Watermaster and the Judgment parties developed revisions to the OBMP based on the need to expand the desalting capacity to the 40,000 afy of groundwater pumping required in the OBMP Implementation Plan. Concurrently, the IEUA and Watermaster worked with the Santa Ana Regional Water Quality Control Board (Regional Board) to revise the total dissolved solids (TDS) and nitrate objectives for the Chino North Management Zone to enable the reuse of the IEUA's recycled water without desalting it for a period estimated to be at least 30 years and without impairing the beneficial use of groundwaters in the Chino and Orange County Basins (Program Element 7). One of the Regional Board's conditions for raising the TDS and nitrate objectives was the achievement of Hydraulic Control. Hydraulic Control is the elimination of groundwater discharge from the Chino North Management Zone to the Santa Ana River or its reduction to less than 1,000 afy. Hydraulic Control is a goal of the OBMP with the intent of maintaining and enhancing the Safe Yield of the basin by ensuring that agricultural groundwater pumping in the southern half of the basin will be replaced by groundwater pumping for municipal uses as the land use in that area transitions from agricultural uses to urban uses. Through extensive investigations, the expansion of desalter groundwater pumping to 40,000 afy and Reoperation were determined necessary to achieve Hydraulic Control and maintain the Safe Yield.

The Peace II Agreement was developed to implement the changes in the OBMP required to expand the desalters to 40,000 afy of groundwater pumping, to incorporate Reoperation and Hydraulic Control, and to resolve other issues. There was no change to the storage management plan in the OBMP Implementation Plan to address the implications of the reduction in storage of basin water by 400,000 af as provided for by Reoperation.

The IEUA completed and subsequently adopted a supplemental environmental impact report (SEIR) for the Peace II Agreement in 2010. The technical investigations conducted to support the expansion of desalter groundwater pumping to 40,000 afy and Reoperation also indicated that the Safe Yield of the Chino Basin had become less than that stated in the Chino Basin Judgment due to changes in cultural conditions in the watershed overlying and tributary to the Chino Basin.

Starting in 2011, Watermaster began the technical effort to recalculate the Safe Yield. This work involved updating the hydrogeologic conceptual model of the basin, updating the historical hydrology, updating and recalibrating numerical models that simulate the surface and ground water hydrology of the Chino Basin area, and projecting the surface and groundwater response of the basin to future management plans that included storage management. This work is documented in *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement* (WEI, 2015; hereafter, Safe Yield report)[2].

In 2017, the IEUA adopted an addendum to the Peace II SEIR to revise the storage management plan in the OBMP through June 30, 2021. The addendum was supported with engineering work that demonstrated that the Safe Storage Capacity could be safely increased from 500,000 af to 600,000 af with the commitment that Watermaster would update the OBMP storage management plan by June 30, 2021.

Need to Update the OBMP

Understanding of the basin hydrogeology and hydrology has improved since 2000, and new water management challenges have been identified that need to be addressed to ensure long-term groundwater pumping sustainability. The strategic drivers/trends that shaped the OBMP in the late 1990s have since changed. There are several drivers and trends that will challenge the ability of the Judgment parties to rely on the OBMP environmental documentation and court approved management agreements (CAMA) to protect their collective interests in the Chino Basin and their water supply reliability. Exhibit 1 graphically illustrates these drivers, associated trends, and their basin management implications. The term "driver" as used herein corresponds to external forces that cause changes in the Chino Basin water space. Grouped under each driver are expected trends that emanate from each driver. The management implications of the drivers/trends on the present and future Chino Basin management are located on the bottom of Exhibit 1. The relationship of the drivers/trends to the management implications are shown by arcs that connect trends to implications. There may be other important drivers/trends and they will be identified in the OBMP update process. The text below summarizes the drivers, trends and management implication shown in Exhibit 1.

Climate Change

Reduced recharge. Present predictions of future precipitation indicate that precipitation patterns will change with more precipitation falling over shorter periods of time and that future droughts will be longer in duration and occur more frequently. This translates into a reduction in precipitation-based recharge to the basin and, if not mitigated, a decline in Safe Yield.

Reduced availability of imported water. Imported water supplies from the State Water Project and surface water sources in the Santa Ana River Watershed will become less reliable with climate change. The availability of imported groundwater from adjacent basins will be reduced for the same reason the Safe Yield of the Chino Basin will likely be reduced.

Legislation and Regulation

Climate science is advancing and generally reporting that the impacts of anthropogenic climate change will occur faster and be more severe than previously anticipated. New laws and regulations will be enacted to reduce greenhouse gas emissions and to mitigate climate change

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[2] This report is located here:
http://www.cbwm.org/docs/engdocs/WEI%202013%20CBWM%20Recalculation%20Model%20Update/20151005_WEI_2013_CBWM_Recal_Model_Final_low.pdf

impacts. These new laws and regulations will likely place additional restrictions on water use to extend existing water supplies and to protect habitat.

Sustainable Groundwater Management Act (SGMA). Pursuant to SGMA, the Chino Basin is exempt from the development of a Groundwater Sustainability Plan (GSP). Currently, Watermaster is required to annually provide limited information to the state. In the near future, it is likely that adjudicated basins will come under greater scrutiny and be required to demonstrate sustainable groundwater management like that required for non-adjudicated basins.

Conservation. New laws and regulations to increase water conservation will reduce the deep infiltration of precipitation and applied water to the basin and, unless mitigated, will decrease the Safe Yield. Conservation may also impact a party's ability to make use of it pumping rights.

Water quality. Drinking water regulations will continue to become more stringent in the future due to new information on the health effects of various chemical and pathogenic constituents and the ability to measure constituents at increasingly lower detection levels.

Salt and Nutrient Management

TDS Increases in the Basin. Watermaster and the IEUA are co-permitees for the use of recycled water in the Chino Basin. The use of recycled water could become more difficult in the future because the ambient TDS concentration in the Chino Basin is increasing and thereby reducing assimilative capacity. Increases in ambient TDS concentrations in the future will cause an increase in the TDS concentration in recycled water produced by the IEUA and will eventually cause the IEUA to desalt its' recycled water when assimilative capacity for TDS is lost in the Chino North Management Zone. When assimilative capacity for TDS is lost under the current SNMP, the IEUA will be required to desalt its recycled water to the TDS groundwater objective of 420 mgl prior to reuse in the Chino Basin.

TDS Increases in SWP Water during Droughts. The TDS concentration in the IEUA's recycled water increased during the recent drought due to concurrent increases in TDS concentration in SWP water and almost triggered a requirement, pursuant to the current SNMP in the Basin Plan, to start the planning process to desalt recycled water. Future droughts will likely be longer in duration and occur more frequently. Unless the SNMP is updated, the requirement to implement recycled water desalting could start with the next drought.

Outside Interest in Chino Basin Operations

There is increasing interest from outside entities in how the regional water agencies and Judgment parties operate the Chino Basin. The State of California consistently enacts more restrictive laws and regulations to protect the environment and to improve habitat sustainability. Public Trust related litigation has been used to halt project development and limit water rights. The Resource Agencies, non-governmental organizations, and Santa Ana River parties are showing renewed interest in Santa Ana River discharges for habitat, water supply, and water rights.

Grant and Low-Interest Loan Project Funding

California voters have a recent history of passing bond initiatives to support water resources projects. The accumulating debt at the national and state level will make it more difficult in the future to obtain grant and low-interest loan funding for water projects. Competition for available funding will increase. Projects approved and constructed in the next few years are more likely to obtain grants and low-interest loans over projects that are deferred into the future.

Improvements in Science and Technology

Laboratory Detection Limits. Improvements in laboratory methods will reduce the detection limits for water quality constituents.

Health Impacts of Chemicals and Pathogens. The number of regulated chemicals will increase, and regulatory standards, based on new research, will become more stringent.

Treatment Technologies. Water treatment technology will improve, enabling water agencies to treat water to more restrictive drinking water standards.

Renewable Energy. The amount of renewable energy available will increase as will the need/requirement to incorporate renewable energy into new projects.

Sensor Technology. There is an increasing trend in the development, cost-efficient availability, and deployment of new terrestrial, aircraft-borne and space-borne sensors that enable the monitoring of the basin and assessment of hydrologic and ecological trends; this will result in improved hydrologic understanding of the basin.

Transparency. Federal and state agencies are requiring that water agencies submit monitoring and other data to them and that these data be made available to the public. The proliferation of these and other publicly available data sources will lead to greater regulatory scrutiny and interest by environmental organizations

The water resource management implications of these drivers and trends for the Judgment parties include:

- reductions in Chino Basin safe yield,
- Chino Basin water quality degradation,
- increased cost of groundwater use,
- reduced imported water availability,
- imported water quality degradation,
- reduced recycled water availability and increased cost,
- recycled water quality degradation, and
- increased cost of Basin Plan compliance.

Mitigation of these implications requires a proactive integrated approach to updating the OBMP.

White Paper – 2020 Update to the Chino Basin Optimum Basin Management Program

The OBMP CEQA Document Needs to Be Updated

The PEIR and SEIR for the OBMP are eighteen and eight years old, respectively: knowledge of the basin's characteristics has improved since these documents were adopted, water management challenges have intensified, and environmental considerations have changed. The PEIR and SEIR are not sufficiently current to support present decision-making and further investment. The existing environmental clearance is too old to be relied upon for receiving state grant and low interest loan funding and render Watermaster and the IEUA to make decisions relying on the earlier environmental evaluations that are vulnerable to collateral attack.

Accordingly, Watermaster needs to review and update (if necessary) its groundwater management goals, articulate impediments to those goals, update the OBMP and its implementation agreement as required by Paragraph 41 of the Judgment, and complete a new CEQA process.

Benefits from Updating the OBMP

The current OBMP contains a set of management activities that improve the reliability and long-term sustainability of the Chino Basin and the water supply reliability of the Judgment parties. The OBMP was developed in 1998 and 1999, based on the goals of the Judgment parties, the hydrologic understanding of the basin, the institutional and regulatory environment, an assessment of the impediments to achieving the Judgment parties' goals, and the actions required to remove the impediments and achieve the goals.

The Judgment parties need to consider whether the OBMP goals have changed, update them, and define the impediments to achieving the goals based on the present and expected hydrologic conditions in the basin, and current and projected trends in the institutional, regulatory, and financing spaces. The parties can then develop an action plan to overcome impediments to achieve the updated OBMP goals. In the absence of an updated OBMP, it will grow increasingly difficult to maintain current and projected groundwater pumping and recycled water reuse and to utilize the unused storage capacity in the basin. An updated OBMP will provide the Judgment parties with: a program-level water resources management plan that maximizes their pumping rights, use of recycled water, use of storage space, and an updated CEQA document to provide certainty for implementation.

Process to Update the OBMP

The process for the development of the 2000 OBMP involved the description of the state of the Chino Basin, the articulation of the Judgment parties' "issues, needs and wants," the Judgment parties' development of OBMP management goals, the articulation of the impediments to achieving the goals, the description of the actions required to remove the impediments, the development of an implementation plan and an agreement among the Judgment parties to fund and implement the OBMP, and the preparation of CEQA documentation. The table below summarizes the effort for the 2000 OBMP and the OBMP update. The text that follows summarizes the update process.

Steps involved in OBMP development

	OBMP Development Step	2000	2020
1	Prepare state of the basin assessment	X	
2	Articulate “issues, needs and wants” and management goals	X	X
3	Describe impediments to management goals	X	X
4	Develop actions to remove impediments	X	X
5	Develop implementation plan	X	X
6	Develop implementation agreement	X	X
7	Prepare CEQA documentation	X	X
8	Court approval	X	X
9	Prepare financing plan		X

1. The combination of the existing 2016 State of the Basin Report, annual report of the Ground Level Monitoring Committee, 2018 Recharge Master Plan Update report, and 2018 Storage Framework report are sufficient to understand the current state of the basin. Also, the 2018 State of Basin report is currently in preparation and will be available to the Judgment parties during the OBMP update process.

2. One to two listening sessions will be held to enable the Judgment parties to articulate their “issues, needs and wants” and their recommended goals for basin management. Watermaster staff will prepare documents that combine and systematize these items and obtain concurrence from the parties that their concerns and goals expressed at these listening sessions have been captured in the planning documents.

3. One to two listening sessions will be held to describe the impediments to achieving the goals. Watermaster staff will prepare documents that combine and systematize the impediments and obtain concurrence from the parties that the impediments expressed at these workshops have been captured in the planning documents.

4. Watermaster staff will develop an initial set of actions that if taken will remove the impediments to the OBMP goals, prepare reconnaissance-level cost estimates to implement the actions, and document this work in a draft TM. Up to three listening sessions will be held to present the actions to the Judgment parties, obtain their comments and suggestions, revise the actions, and subsequently finalize the TM.

5. Watermaster staff will create a draft implementation plan for the OBMP update and document it in a draft TM. One or two listening sessions will be held to present the implementation plan to the Judgment parties, obtain their comments and suggestions, and subsequently incorporate them into the draft TM.

6. Watermaster will provide a facilitated process for the Judgment parties to develop an agreement to implement the OBMP update.

7. The IEUA will prepare the appropriate CEQA documentation for the OBMP update.

8. Upon completion of the implementation agreement and CEQA, Watermaster and the Judgment parties will seek Court approval of the OBMP update.

9. After the CEQA document is adopted by the IEUA, the Judgment parties, the IEUA, and interested entities will prepare a financing plan.

OBMP Update Schedule

Steps 1 through 5, ending with the development of the OBMP implementation plan, will be completed in the period of January 2019 through December 2019. The development of the OBMP implementation agreement and CEQA will be completed in the period of January 2020 through June 2020. Court approval and the development of a financing plan will occur thereafter.

Appendix B

Response to Comments on the November 22, 2019
Draft 2020 OBMP Update Report

NOTE: In addition to any changes made to the 2020 OBMP Update Report based on the following comments, the text of Section 3.2.8.1 was edited to align with the final 2020 SMP published on December 11, 2019.

2020 OBMP Update Report Comments

Overlying Non-Agricultural Pool – Comments reported out of 12/12/19 Confidential Session

1. ***The Pool requests further clarification on its comment #2 regarding conjunctive use and its definitions in the Storage Management Plan:***
   Page 1-4 and Page 2-1 – Conjunctive-Use. Section 1.2 and Section 2.1 talk about conjunctive-use. How is conjunctive-use defined? What is included and excluded?

   RESPONSE: Page 1-4 of the final 2020 Storage Management Plan describes the conjunctive use activities of the Parties as "storing Basin and Supplemental Waters that are in excess of their demands and subsequently recover that water as their individual needs arise". More generally speaking, conjunctive use is the coordinated use of surface and groundwater resources such that surface water is used to augment groundwater storage (direct or in-lieu) in wet years and groundwater is used in dry years. For the SMP, this term is being used as a descriptive term, and not a term that requires definition.

City of Chino – Comments Provided by Dave Crosley (via email 12/19/19)

1. ***Typos are noted on scanned copies of pages 4, 8, 19, 24, and 35 (attached).***

   RESPONSE: Typos have been noted and corrected.

2. ***The draft OBMP Update indicates that some of the described implementation actions are required for Watermaster to properly administer the Judgment. Stakeholder agreement that these actions are "required" may be the subject of some continuing discussion. We suggest the OBMP Update remain in draft form designation until such discussion has concluded.***

   RESPONSE: The rationale for identifying implementation actions associated with the OBMP Update activities as "required" is described in part in Section 2 of the 2020 OBMP Update Report. During the forthcoming drafting sessions for the Implementation Plan Update, Watermaster will respond to questions about the basis for any specific action. To provide additional clarity, a new table (Exhibit 17) has been added to Section 4 of the final report that includes a description of the rationale for each required action in the management plan.

3. ***It would be helpful to expand Program Element tables 11 -17, describing proposed 2020 OBMP Implementation Actions, to include an additional column describing anticipated/estimated annual expense associated with the implementation of each activity (e.g. as presented in various tables included in the scoping report).***

   RESPONSE: The cost estimates for the activity scopes of work in the 2020 OBMP Update Scoping Report (TM1) were developed based on many assumptions, and should be used as very general guidance as to potential costs based a specific scope of work. These estimates have been provided only to describe a concept, i.e. the conceptual phases envisioned by Watermaster staff/consultants in developing the Implementation Actions' scope, and are not a fixed number or a budgetary commitment. The Committees envisioned to oversee the management processes will ultimately guide the actual efforts (i.e. scope, expense, schedule) similar to the GLMC. Estimated cost ranges have been described in TM1, which are included in the OBMP Update Report (TM2) as Appendix B. The draft OBMP IP Update (under preparation by Watermaster staff, to be released late January) will include a consolidated listing of the proposed new Implementation Actions and their associated cost estimates to assist the parties.

4. ***To the extent that information obtained from technical analyses performed in support of, and described in, the 2000 OBMP have been updated by more recent technical analyses, the more recently developed and updated information should be included in the draft 2020 OBMP Update to clarify the current understanding of basin circumstances.***

   RESPONSE: We understand that your question is in regard to the concept of the Safe Storage Capacity (SSC). The SSC was part of the storage management construct in the 2000 OBMP. As described in the 2018 Storage Framework Investigation, and summarized in the 2020 OBMP Update Report, the new hydrogeologic understanding of the basin developed through implementation of the OBMP has indicated that the management construct in the 2000 OBMP is no longer valid and the concept of SSC is not included in the new 2020 Storage Management Plan. The text of Section 3.2.8.1 of the 2020 OBMP Update Report has been modified to more clearly articulate this. This section was also edited to align with the final 2020 SMP published on December 11, 2019.

5. ***The draft 2020 Storage Management Plan (SMP) indicates a reduction in net recharge is believed (based on modeling) to be caused by storage, and that Watermaster considers this impact to be mitigated by the prospective calculation of Safe Yield. [a] Related to this circumstance, the SMP indicates that storage accounts may be adjusted based on findings of the 2020 Safe Yield recalculation. As the 2020 Safe Yield recalculation is currently a work-in-progress, the suggestion that storage accounts may be adjusted is premature at this time. [b] Additionally, the OBMP Update should clarify that storage is only one of several contributing factors (cultural conditions) that may have an effect on net recharge.***

   RESPONSE: 5(a) The final 2020 SMP does not state that Watermaster will adjust the storage accounts of the Parties based their water in managed storage. It does say that it will debit the storage accounts for each Storage and Recovery Program for its storage impact on net recharge and Safe Yield caused by the Storage and Recovery Program. The loss rate (reduction in net recharge caused by storage) will be established uniquely for each Storage and Recovery Program and is independent of the 2020 Safe Yield recalculation.

   5(b) Comment noted. Please see the final 2020 SMP, Appendix B2, City of Chino comment number 3 and Watermaster staff response.

6. ***The draft OBMP Update describes, pertinent to various Activities, the formation of new, or re-convening of past/existing, specific committees for the purpose of focusing attention on matters related to the subject Activity. These committees should have responsibility for recommending the scope and frequency of tasks pertinent to Activity implementation.***

   REPONSE: Comment noted. This is the intent for implementation of each management process, as articulated in Section 2, page 12, in the last paragraph, sub-bullet (1).

Overlying (Agricultural) Pool – Comments Provided by Robert Feenstra (12/20/19 letter)

7. ***Watermaster staff have requested comments on the draft 2020 OBMP Update Report (Technical Memorandum 2) (Update Report) by close of business on Friday, December 20, 2019. The Overlying (Agricultural) Pool (Ag Pool) has reviewed the draft Update Report, which incorporates the 2020 Storage Management Plan. The Ag Pool has consistently expressed concern regarding water storage that has been accumulating and used without adequate storage management, including contesting the Watermaster's continued approval of water storage and transfer/sale agreements of the Appropriative Pool. The 2020 Storage Management Plan is not complete as it must still be finalized and approved as part of the 2020 OBMP Update. The Ag Pool urges Watermaster to move forward expeditiously with the final adoption and approval of the OBMP Update including storage management.***

   RESPONSE: Comment noted

8. ***Section 1.2 of the Update Report (at page 8) uses two new terms, "water management space" and "Chino Basin water space." These new terms should be defined.***

   RESPONSE: The terms are being used as descriptive terms, and not terms that require definition.

9. ***Section 2.1. Page 11 in the Updated Report describes the attached Exhibit 3 as "a matrix, summarizing the needs and wants of the stakeholders..." But the attached Exhibit 3 does not accurately represent the Ag Pool's needs and wants as a Pool or as Pool subgroups of "Crops, Dairy, and State." The items shown in Exhibit 3 represent comments made by individuals in an early OBMP listening session/workshop that included comments from most of the other Basin stakeholders. After the initial meeting/listening session, the Ag Pool indicated to Watermaster that it preferred to report out its needs and wants as a Pool rather than as subgroups, but the Ag Pool did not complete the matrix after seeing the progress and direction of the OBMP Update process in subsequent listening sessions/workshops. Consequently, Exhibit 3 for the Ag Pool's "needs and wants" should be considered incomplete because not all needs and wants are represented and there is also mutual support between each Ag Pool subgroup (i.e., Crops, Dairy, and State) for the needs and wants indicated by the other subgroups.***

   RESPONSE: Comment noted; the OAP has been invited to offer edits to Exhibit 3 that would fully represent its Issues/Needs/Wants.

10. ***Section 3.2.3.1. At page 28 in the draft Updated Report, the first sentence of the first full paragraph uses the term "brackish." However, the term "brackish" covers a wide range of total dissolved solids (TDS), from freshwater to sea water (500 to 30,000 milligrams per Liter). We suggest being more specific or defining the general range of TDS concentrations.***

    COMMENT: The text will be adjusted for clarity.

Monte Vista Water District – Comments Provided by Justin Scott-Coe (12/23/19 letter)

11. ***If a subsequent and new OBMP Implementation Plan is agreed to by the Peace Agreement parties, will all parties initially be required to pay for the planning and management efforts (not including CEQA costs) envisioned in the OBMPU Update? If so, how will future project participants reimburse non-participants for their share of associated CEQA coverage and OBMPU planning and management costs (i.e., beneficiary pays)?***

    RESPONSE: The development of the OBMP Update to date has assumed that the existing methodology for sharing OBMP expenses will continue. Should the parties wish to share costs differently in the future, Watermaster will assess the parties accordingly.

12. ***As part of Program Element No.6, the implementation action of "develop and implement an initial emerging contaminants monitoring plan and prepare a water quality assessment of the Chino Basin to evaluate the need for a Groundwater Quality Management Plan and prepare a long-term emerging contaminants monitoring plan" has been identified as a required Watermaster action. The language of Judgment paragraph 41 does not seem to require Watermaster to perform this action. Please identify what court approved document and its language make the said implementation action a requirement.***

    RESPONSE: Paragraph 41 of the Judgment states: *"Watermaster Control. Watermaster, with the advice of the Advisory and Pool Committees, is granted discretionary powers in order to develop an optimum basin management program for Chino Basin,* ***including both water quantity and quality considerations****. Withdrawals and supplemental water replenishment of Basin Water, and* ***the full utilization of the water resources of Chino Basin, must be subject to procedures established by and administered through Watermaster with the advice and assistance of the Advisory and Pool Committees*** *composed of the affected producers.* ***Both the quantity and quality of said water resources may thereby be preserved and the beneficial utilization of the Basin maximized****."* (Pgs. 19-20 of the Restated Judgment)

    Paragraph 41 states that maximization of the beneficial use of the Basin requires consideration of both water quantity and water quality considerations. The Judgment could not and does not prescribe every conceivable water quality management action necessary to address every potential contaminant. It does recognize that If water quality is not effectively managed, Parties may not be able to utilize their water rights, which could result in negative impacts to the basin, such as reductions in net recharge, loss of hydraulic control, and movement of contaminant plumes. Program Element 7 of the 2000 OBMP, the salt and nutrient management plan, is an example of a water quality management program not specifically named in the Judgment that has been a successfully implemented to avoid the negative impacts of reduced/re-located pumping to avoid high-TDS and high-nitrate groundwater. Effective management of water quality in the Basin to preserve maximum beneficial use can only be accomplished through a systematic assessment of the emerging contaminant threats to the use of groundwater resources, and thoughtfully preparing a plan to respond to those threats.

13. ***The Storage and Recovery Master Plan, found in Program Elements 8/9, should not be considered required by Watermaster, and request that the "required" label be removed from this proposed activity in the final version of the OBMP Update and associated documentation.***

    RESPONSE: Please refer to the response to City of Chino comment #2.

14. ***MVWD encourages the Watermaster to pursue the CEQA process which will allow the up to 1 million acre-feet of storage within the basin, premised in part on the completed Storage Framework Investigation.***

    RESPONSE: Comment Noted. Watermaster is proceeding with the analysis of storage of up to 1 million acre-feet, consistent with the Appropriative Pool recommendation.

15. ***Our understanding is that, while Watermaster has discretion in managing storage through agreements, the current Storage Management Plan that Watermaster has agreed and been ordered by the Court to follow is part of the OBMP Implementation Plan, which is a component of a negotiated settlement and agreement among the parties to the Peace Agreement. Therefore, adoption of a new Storage Management Plan should be seen as an amendment to this negotiated settlement/agreement and follow the process for amending the Peace Agreement. Please confirm if this understanding is correct.***

    RESPONSE: Updating the Storage Management Plan, an element of the 2000 OBMP IP that is an Exhibit to the Peace Agreement, is an update of the OBMP IP. Other thanthe Peace Agreement's requirement of unanimous approval for amendments, as have been done on two past occasions, Watermaster is not aware of any specific procedures for amending the Peace Agreement.

16. ***Before drafting and publishing the Draft OBMP Implementation Plan, MVWD encourages Watermaster to have dialog with Peace Agreement parties to determine what elements those parties would want included in such plan.***

    RESPONSE: The implementation actions arising from the parties identification of their issues, needs, and wants have been publicly available and were last distributed during the December Advisory Committee meeting. The planned process of developing a draft Implementation Plan, as has been discussed during the Listening Sessions, and Committee meetingss , includes the initiation of drafting sessions (as needed) in early February where all concerns related to the implementation plan can be openly discussed amongst all stakeholders.

City of Ontario – Comments Provided by Scott Burton (12/20/19 letter)

17. ***The draft Optimum Basin Management Plan (OBMP) Update report represents a comprehensive set of ideas related to water management in the region including topics such as water resources, water infrastructure, emerging water quality requirements and protecting the groundwater basin. The listening sessions and guided input have provided ample opportunity for participating stakeholders to share their ideas. It is important to note that while stakeholders have had the opportunity to comment, the disposition, vetting and deliberation of varying stakeholder views was largely deferred to a later date. Currently, the draft OBMP Update report reflects the recommendations of Watermaster staff planned for the Watermaster Board.***

    RESPONSE: The OBMP Update reflects stakeholder input received by Watermaster during Listening Sessions held in 2019. The document is a compilation of all input and Watermaster staff and consultants believes it represents a collective view of what could be done to manage the Basin. The document reflects Watermaster staff conclusions of which implementation actions (management processes) are required for Watermaster to perform its duties, and captures all the suggestions offered by stakeholders.

18. ***The draft OBMP Update report includes a list of activities whose outcomes are identified as either optional or necessary for Watermaster. A number of these activities are already underway in various retail and regional forums peripheral to Watermaster. Examples include storage and recovery, movement of water between retail agencies, regional water treatment and conveyance, water supply reliability and water quality management. While the City of Ontario (Ontario) agrees that there are necessary activities in managing this critical water resource, there are some activities defined by Watermaster staff as necessary which we think may be more at the option of the stakeholders. It is highly recommended that this definitional distinction be vetted and deliberated with the stakeholders prior to the Watermaster Board acting on the OBMP Update report.***

    RESPONSE: Please refer to the response to the City of Chino comment #2.

19. ***Ontario supports the effort to consider and update the OBMP implementation with some of these new and continued ideas and believes that, consistent with the Peace Agreement, it is a step toward the meet and confer process in the 25th year of the agreement to discuss any new or modified terms. While Watermaster staff seems to consider the draft OBMP Update report substantially complete, the most critical and in-depth phase of the OBMP implementation update is just beginning. The next step is for the stakeholders to develop an Implementation Plan and Implementing Agreement(s) that reflect the common interests of the parties to the Judgement. This may differ from what is envisioned by Watermaster staff. It is Ontario's hope that to the extent there are differences, they can be reconciled prior to Watermaster Board action on the OBMP Update report.***

    RESPONSE: As with prior amendments to the Peace Agreement, Watermaster staff understands that an update of the 2000 OBMP IP can be undertaken through a focused effort as to this narrow set of issues, without addressing unrelated portions of the Peace Agreement.

Watermaster staff envisions the same next steps of creating an IP Update and crafting an amendment to the Peace Agreement to move forward. The process will begin in early February, during which all the stakeholders can weigh in on their interests and concerns on each component of the implementation plan.

20. ***As we have discussed, there are activities within the draft OBMP Update report that Ontario believes are either not necessary, already underway or may be more appropriately stakeholder managed outside of the Watermaster forum. As part of determining the OBMP implementation scope, Ontario intends to consider things such as cost-benefit analysis, prioritizing available financial resources in the context of other retail agency needs, the optimal forum for various activities to occur, avoidance of redundant efforts, determination of appropriate stakeholder funding, impact on the cost to produce groundwater, and assurance towards a reliable and sustainable groundwater basin. For activities currently required by the Peace Agreements, the Stakeholders may decide to modify or otherwise update the requirement. In addition, Ontario will need to complete its internal review process and timeline to facilitate Ontario's City Council making an informed decision on behalf of the public they represent.***

    RESPONSE: Comment noted.

21. ***The very important work ahead includes decisions still to be discussed, deliberated, and formalized in an amended Peace Agreement. Taking the technical ideas from draft report to a completed Implementation Plan and Implementing Agreement(s) requires flexibility, finesse and collaboration. Ontario is concerned that prioritizing the schedule above all else may compromise the result. As a next step, Ontario requests that the stakeholders be provided the opportunity to collaborate with Watermaster staff in setting a reasonable and realistic schedule and approach to enhance a successful outcome for this effort and the investments that will follow.***

    RESPONSE: Watermaster has engaged the stakeholders in a process designed to meet the short term needs as well as enable long term management of the Basin for the interest of the stakeholders. The City, as all stakeholders, is encouraged to provide feedback on the schedule and approach necessary to achieve a successful outcome for this effort.

Appropriative Pool – Comments provided by Tom Harder (01/22/2020 letter)

22. ***Section 3.2.8 Program Element 8. Develop and Implement a Storage Management Program and Program Element 9. Develop and Implement Storage and Recovery Programs:***
    In Table 10 or preceding text, please define UGRR

    RESPONSE: The term means "Uniform Groundwater Rules and Regulations". The UGRR is now part of the Watermaster Rules and Regulations. A footnote will be added to the table for clarification.

23. ***Section 3.2.8.1 Implementation Progress Since 2000 and Ongoing Implementation Actions for the 2020 OBMP:***

    Pg. 47, section that starts, "The 2020 SMP includes the following provisions specific to the Parties and Storage and Recovery Program:" Second minor bullet under second major bullet:
    - ***With regard to the storage management activities of the Parties:***

      o ~~The~~ Any reduction in net recharge caused by storage in the FMSB is an adverse impact, and Watermaster considers this adverse impact to be mitigated by the prospective calculation of Safe Yield.

    As written, this sentence makes it sound like reduction in net recharge is a given if the volume of groundwater in storage changes. Groundwater pumping patterns also impact net recharge. This is why the change indicated in red above is recommended.

    RESPONSE: The text has been modified to reflect this suggested change.

24. ***Pg. 47, last bulleted item, "Watermaster will periodically review current and projected basin conditions and compare this information to the projected basin conditions…"***

    It is recommended that future reviews of the impact of storage and recovery projects be done on an annual basis.

    RESPONSE: Comment noted

25. ***Section 4 2020 OBMP Update Management Plan***
    In general, it is noted multiple places in Section 4 reference the preparation of work plans and management plans. Program Element 1 (Table 11) describes the need to prepare an OBMP Monitoring and Reporting Work Plan. Elsewhere in the document, there are other water quality and monitoring/management work plans identified under Program Element 6, including:
    - ***Emerging Contaminants Monitoring Plan (Table 15 – 2nd and 3rd Row)***
    - ***Groundwater Quality Management Plan (Table 15 – 5th Row).***

    In addition, the Salt and Nutrient Management Plan (SNMP) under Program Element 7 includes monitoring and reporting of groundwater quality data. [A] Is it possible to combine the monitoring and reporting work plans into one comprehensive document instead of multiple individual plans? [B] Are there any negative consequences of doing so? [C] Would the

existing OBMP Maximum Benefit Monitoring Program 2014 Work Plan be replaced by the OBMP Monitoring and Reporting Work Plan?

RESPONSE:
[A] and [B] The intent is to have one single monitoring program work plan, the OBMP Monitoring and Reporting Work Plan, that covers all of the Watermaster programs listed in Table 2 of the OBMP Update Report, with the exception of the initial emerging contaminant (EC) monitoring program included in PE 6. The initial EC monitoring program is envisioned as a stand-alone work plan as it is intended to be a short-term, one-time effort to collect the data needed to evaluate ECs in the Chino Basin. PE 6 also provides for the development of a long-term EC monitoring plan as part of the development of the Groundwater Quality Management Plan. This long-term EC monitoring plan, once developed, would be incorporated into the OBMP Monitoring and Reporting Work Plan.

[C] Yes, if the Parties elect to prepare the OBMP Monitoring and Reporting Work Plan, the existing 2014 OBMP Maximum Benefit Monitoring Program Work Plan would be incorporated as part of the new work plan. Note that Watermaster and IEUA are currently working on an update to the Chino Basin maximum benefit SNMP commitments, which could result in changes to the monitoring plan described in the 2014 OBMP Maximum Benefit Monitoring Program Work Plan. Once the SNMP update work is completed and any recommended changes are approved by the Regional Board, these changes would be documented in the governing work plan.

Appendix C

2020 Optimum Basin Management Program Scoping Report

Appendix C

To: Chino Basin Watermaster Stakeholders

From: Watermaster 2020 OBMP Update Team

Subject: 2020 OBMP Update: Scoping Report – Development of Activities for Consideration

Date: Draft Part 1, July 24, 2019; Draft Part 2, August 22, 2019;
Final November 22, 2019

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1. Introduction and Background

Objectives and Purpose of the Scoping Report

The Chino Basin Watermaster (Watermaster) is in the process of updating its Optimum Basin Management Program (OBMP) and its implementation plan. The objectives of this first Technical Memorandum, *2020 OBMP Update: Scoping Report – Development of Activities for Consideration* (Scoping Report), are: (1) to describe the stakeholder process to develop the 2020 OBMP Update, (2) to document the key outcomes of the stakeholder process to date, and (3) to describe the proposed scope of work, implementation actions, schedule, and cost to perform the following eight activities developed by the stakeholders for consideration for inclusion in the 2020 OBMP Update:

1. Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water—particularly in areas of the basin that will promote the long-term balance of recharge and discharge (Activity A).
2. Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality (Activity B)
3. Maximize the reuse of recycled water produced by IEUA and others (Activity D).
4. Develop and implement a water-quality management plan to address current and future water-quality issues, protect beneficial uses, and develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits (Activity E/F).
5. Develop a management strategy within the salt and nutrient management plan to ensure the ability to comply with the dilution requirements for recycled water recharge (Activity K).
6. Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence and optimize the use of all water supply sources (Activity C/G).
7. Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance (Activity L).
8. Develop a process to provide for the equitable distribution of the costs and benefits of the OBMP Update, to encourage regional partnerships for implementation to reduce costs, and to identify and pursue low-interest loans, grants, or other external funding sources to support the implementation of the OBMP Update (Activity H/I/J).

The purpose of the Scoping Report is to provide the Parties with an understanding of the work that would need to be performed to accomplish the desired outcomes of each of the 2020 OBMP Update activities. To the extent that the scopes of work described herein are already being partly or completely performed by Watermaster or others, this Scoping Report acknowledges such. The next steps in the process to prepare the 2020 OBMP Update will focus on the review and revision of the activities scoped herein and the integration of the ongoing activities with the existing OBMP. The recommended 2020 OBMP Implementation Plan, inclusive of ongoing and new activities will be documented in a subsequent report, *2020 Optimum Basin Management Program Update Report*, and will form the foundation for the Parties to develop a final implementation plan and agreements to implement the OBMP Update.

History of the OBMP

The Chino Basin Judgment gave Watermaster the discretionary authority to develop an OBMP for the Chino Basin, including both water quantity and quality considerations. Watermaster, with direction from the Court, began developing the OBMP in 1998 and completed it in July 2000. The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders, described the physical state of the groundwater basin, defined a set of management goals, characterized impediments to those goals, and developed a series of actions that could be taken to remove the impediments and achieve the management goals. This work was documented in the *Optimum Basin Management Program – Phase I Report*.[1]

The four goals of the 2000 OBMP included:

> *Goal 1 – Enhance Basin Water Supplies*
>
> *Goal 2 – Protect and Enhance Water Quality*
>
> *Goal 3 – Enhance Management of the Basin*
>
> *Goal 4 – Equitably Finance the OBMP*

The actions defined by the stakeholders to remove impediments to the OBMP goals were logically grouped into sets of coordinated activities called Program Elements (PEs), each of which included a list of implementation actions and an implementation schedule. The nine PEs defined in the 2000 OBMP included:

> *PE 1 – Develop and Implement Comprehensive Monitoring Program*. The objectives of the comprehensive monitoring program are to collect the data necessary to support the implementation of the other eight PEs and periodic updates to the *State of the Basin Report*[2].
>
> *PE 2 – Develop and Implement Comprehensive Recharge Program*. The objectives of the comprehensive recharge program include increasing stormwater recharge to offset the recharge lost due to channel lining, to increase Safe Yield, and to ensure that there will be enough supplemental water recharge capacity available to Watermaster to meet its Replenishment Obligations.
>
> *PE 3 – Develop and Implement a Water Supply Plan for Impaired Areas*. The objective of this program is to maintain and enhance Safe Yield with a groundwater desalting program that is designed (1) to replace declining agricultural groundwater pumping in the southern part of the basin with new pumping to meet increasing municipal water demands in the same area (2) to minimize groundwater outflow to the Santa Ana River, and (3) to increase the Santa Ana River recharge into the basin.
>
> *PE 4 – Develop and Implement Comprehensive Groundwater Management Plan for Management Zone 1*. The objectives of this land subsidence management program are to characterize the

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[1] WEI. (1999). *Optimum Basin Management Program – Phase I Report*. Prepared for the Chino Basin Watermaster. August 19, 1999. http://www.cbwm.org/docs/engdocs/OBMP%20-%20Phase%20I%20(Revised%20DigDoc).pdf

[2] See for example: WEI (2019). *Optimum Basin Management Program 2018 State of the Basin Report*. Prepared for the Chino Basin Watermaster. June 2018. This document is available on Watermaster's website at http://www.cbwm.org/

spatial and temporal occurrence of land subsidence, to identify its causes, and, where appropriate, to develop and implement a program to minimize or stop land subsidence.

PE 5 – Develop and Implement Regional Supplemental Water Program. The objective of this program is to improve the regional conveyance and availability of imported and recycled waters throughout the basin.

PE 6 – Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management. The objectives of this water quality management program are to identify water quality trends in the basin and the impact of the OBMP implementation on them, to determine whether point and non-point contamination sources are being addressed by water quality regulators, and to collaborate with water-quality regulators to identify and facilitate the cleanup of soil and groundwater contamination.

PE 7 – Develop and Implement Salt Management Plan. The objectives of this salinity management program are to characterize current and future salt and nutrient conditions in the basin and to develop and implement a plan to manage them.

PE 8 – Develop and Implement Groundwater Storage Management Program. The objectives of this storage program are (1) to implement, and periodically update, a storage management plan that prevents overdraft, protects water quality, and ensures equity among the Parties and (2) to periodically recalculate Safe Yield. This PE explicitly defined the storage management plan, including a “Safe Storage Capacity” for managed storage of 500,000 acre-feet (af) – inclusive of local and supplemental storage and Storage and Recovery Programs.

PE 9 – Develop and Implement Storage and Recovery Programs. The objectives of the conjunctive use program are to develop Storage and Recovery Programs that will provide broad mutual benefit to the Parties and ensure that basin water and storage capacity are put to maximum beneficial use while causing no Material Physical Injury (MPI).

The PEs and their associated implementation actions were incorporated into the OBMP Implementation Plan (OBMP IP). The Chino Basin Judgment Parties (Parties) then developed an agreement—the Peace Agreement—to implement it. The OBMP IP is Exhibit B to the Peace Agreement. The Peace Agreement was reviewed in a programmatic environmental impact report (PEIR), completed by the Inland Empire Utilities Agency (IEUA) in July 2000.

For purposes of the discussions in this report, the term OBMP refers to the collective programs implemented by Watermaster and others (e.g. IEUA, the Chino Basin Desalter Authority, etc.) pursuant to the Peace Agreements, the OBMP Implementation Plan, the PEIR, and any amendments to these documents.

2007 Supplement to the OBMP IP and the Peace II Agreement

The work to develop the OBMP determined that the groundwater pumping capacity of the Chino Basin Desalters would ultimately need to be 40,000 acre-feet per year (afy) to accomplish the goals of the OBMP; however the Peace Agreement only provided for the development of the first 20,000 afy of this capacity and the Parties committed to developing expansion and funding plans the remaining capacity within five years of approval of the Peace Agreement. The Parties developed the Peace II Agreement that included provisions to expand the desalting capacity to 40,000 afy. The Peace II agreement introduced Re-operation[3] to achieve Hydraulic Control[4] of the Chino Basin and maintain Safe Yield. Hydraulic Control is both a goal of the OBMP and a requirement of the maximum benefit salt-and-nutrient management plan (SNMP) that was developed by Watermaster and IEUA under PE 7 to enable the expansion of recycled water recharge and reuse throughout the basin under PEs 2 and 5.

The Parties executed the Peace II Agreement in 2007, which included a supplement to the OBMP Implementation Plan to expand the Chino Basin Desalters to 40,000 afy of groundwater pumping, to incorporate Re-operation and Hydraulic Control, and to resolve other issues. There were no changes to the storage management plan in the OBMP Implementation Plan to address the implications of the reduction in storage of basin water by 400,000 af as provided for by Re-operation.

The IEUA completed and adopted a supplemental environmental impact report (SEIR) for the Peace II Agreement in 2010.

2017 Addendum to the 2010 Peace II SEIR

In 2016, Watermaster identified the need to update the OBMP storage management plan because the total amount of water in managed storage accounts was projected to exceed the Safe Storage Capacity limit of 500,000 af defined in the 2000 OBMP. In 2017, the IEUA adopted an addendum to the Peace II SEIR to revise the storage management plan in the OBMP through June 30, 2021. The addendum was supported with engineering work that demonstrated that the Safe Storage Capacity could be safely increased to 600,000 af with the commitment that Watermaster would update the OBMP storage management plan by June 30, 2021.

Need for the 2020 OBMP Update

As of 2019, many of the projects and management programs envisioned in the 2000 OBMP have been implemented, while some have not. The understanding of the hydrology and hydrogeology of the Chino Basin has improved since 2000, and new water-management issues have been identified that need to be addressed to protect the collective interests of the Parties and their water supply reliability. For these reasons, the Parties are updating the OBMP to set the framework for the next 20 years of basin-management activities.

A more detailed description of the development of the 2000 OBMP and the rationale for and process to prepare the 2020 OBMP Update is included in a white paper prepared for the stakeholders: *White Paper – 2020 Update to Chino Basin Optimum Basin Management Program* (OBMP White Paper). The OBMP White Paper, and all documents relevant to the 2020 OBMP Update, are available on the Watermaster's website.[5]

[3] Re-operation is the controlled overdraft of the Basin by the managed withdrawal of groundwater pumping for the Desalters and the potential increase in the cumulative un-replenished pumping from the 200,000 acre-feet authorized by paragraph 3 of the Engineering Appendix Exhibit I to the Judgment, to 600,000 acre-feet for the express purpose of securing and maintaining Hydraulic Control as a component of the Physical Solution.

[4] Hydraulic Control is the elimination of groundwater discharge from the Chino North Management Zone to the Santa Ana River or its reduction to less than 1,000 afy.

[5] http://www.cbwm.org/OBMPU.htm

Stakeholder Process for the 2020 OBMP Update

The 2020 OBMP Update is being conducted using a collaborative stakeholder process like that employed for the development of the 2000 OBMP. A series of public listening sessions are being held by the Watermaster throughout 2019 to support the 2020 OBMP Update. The purpose of the listening sessions is to obtain information, ideas, and feedback from the stakeholders to define their issues needs and wants, their collective goals for the 2020 OBMP Update, the impediments to achieving the goals, the management actions required to remove the impediments, and an implementation plan for the management actions.

The Watermaster has established an OBMP Update Team to facilitate the stakeholder process. The OBMP Update Team is composed of Watermaster staff, Watermaster legal counsel, engineers and scientists from Wildermuth Environmental Inc. ([WEI] Watermaster's engineering consultant), and staff from the IEUA. The OBMP Update Team is providing key information prior to and during each listening session to enable the stakeholders to provide their input on each topic discussed. The objective is for the ideas and opinions of every stakeholder to be heard. Participation in the listening sessions is critical to the development of the 2020 OBMP Update.

The work documented in this Scoping Report is based on the discussions and feedback from the first four listening sessions, which were held on the following dates:

- Listening Session #1: January 15, 2019
- Listening Session #2: February 12, 2019
- Listening Session #3: March 21, 2019
- Listening Session #4: May 16, 2019

The objectives of the first four listening sessions were (1) to confirm the need to update the OBMP, (2) to identify the issues, needs, and wants of the stakeholders, (3) to define goals for the 2020 OBMP Update, and (4) to identify the new and revised activities that could be included in the 2020 OBMP Update to remove impediments to achieving the 2020 OBMP Update goals. Listening Session memorandums were prepared to document the outcomes of Listening Sessions 1, 2, and 3. The listening session memorandums are included as appendices herein. This Scoping Report summarizes and integrates the work products of the first four listening sessions and provides new information on the recommended scope of work to implement the 2020 OBMP Update activities defined by the stakeholders.

The next series of listening sessions will focus on the review and revision of the activities scoped herein and the integration of those activities with the existing OBMP. The outcomes will be integrated into a recommended implementation plan for the 2020 OBMP Update. The second TM, *2020 Optimum Basin Management Program Update Report*, will form the foundation for the Parties to develop a final implementation plan and agreements to implement the OBMP Update.

2. Development of Activities for Consideration in the 2020 OBMP Update

Drivers, Trends and Implications for Basin Management

The strategic drivers and trends that shaped the goals and activities of the OBMP in the late 1990s have since changed. There a several drivers and trends in today's water management space that will challenge the ability of the Parties to protect their collective interests in the Chino Basin and their water supply reliability. Figure 1 characterizes the drivers and trends shaping water management, and their basin management implications for the Parties. "Drivers" are external forces that cause changes in the Chino Basin water space, such as climate change, regulations, and funding. Grouped under each driver are expected trends that emanate from that driver. For example, trends associated with climate change include reduced groundwater recharge, increased evaporation, and reduced imported water supply. The relationship of the drivers/trends to the management implications are shown by arcs that connect trends to implications. For example, a management implication of reduced groundwater recharge is the reduction of the Chino Basin Safe Yield.

The drivers, trends, and implications were first identified in the OBMP White Paper and served as the initial rationale for recommending an update to the OBMP. Figure 1 represents the final characterization of the drivers, trends, and implications, based on stakeholder input. The basin management implications that form the stakeholders' rationale for the 2020 OBMP Update are:

- Reductions in Chino Basin Safe Yield
- Reduced imported water availability and increased cost
- Imported water quality degradation
- Chino Basin water quality degradation
- Inability to pump groundwater with existing infrastructure
- Increased cost of groundwater use
- Recycled water quality degradation
- Reduced recycled water availability and increased cost
- Increased cost of Basin Plan compliance

Issues, Needs, and Wants of the Chino Basin Stakeholders

The issues, needs, and wants of the stakeholders form the basis of the management goals of the 2020 OBMP Update and inform the identification of impediments to the goals as well as the action items to remove the impediments. Through the listening session process, 57 unique needs and wants were identified by the stakeholders. The classes of issues identified were effectively the same as the implications for basin management defined in Figure 1 and listed above. Table 1 is a matrix that summarizes: the needs and wants of the Parties, organized by basin management issue (rows) and attribution to stakeholders that share each need/want (columns).

2020 OBMP Goals

Through the assessment of the basin management issues, needs, and wants, the stakeholders concluded that the goals defined in the 2000 OBMP are still relevant today. The following is the statement of intent developed for each goal in the 2020 OBMP Update:

> ***Goal No. 1 - Enhance Basin Water Supplies.*** The intent of this goal is to increase the water supplies available for Chino Basin Parties and improve water supply reliability. This goal applies to Chino Basin groundwater and all other sources of water available for beneficial use.

Goal No.2 - Protect and Enhance Water Quality. The intent of this goal is to ensure the protection of the long-term beneficial uses of Chino Basin groundwater.

Goal No.3 - Enhance Management of the Basin. The intent of this goal is to encourage sustainable management of the Chino Basin to avoid Material Physical Injury, promote local control, and improve water-supply reliability for the benefit of all Chino Basin Parties.

Goal No. 4 - Equitably Finance the OBMP. The intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation.

The far right-hand column of Table 1 (issues, needs, and wants) illustrates the nexus of the goals to the needs and wants of the Parties.

Activities for Consideration in the 2020 OBMP Update

There are physical, institutional, and financial impediments to achieving the 2020 OBMP's goals. The issues, needs, and wants of the stakeholders shown in Table 1 recognize these impediments. The stakeholders identified and described 12 new and revised activities that will be considered for inclusion in the 2020 OBMP Update. The 12 activities are listed in Table 2. Table 1 illustrates which of the 12 activities (identified by the letters A through L, as characterized in Table 2) the stakeholders believe have the potential to address each of their needs and wants. 55 of the 57 needs and wants were identified as addressed by one or more of the proposed activities.

Nexus Between the 2020 OBMP Update Goals, Their Impediments, and the Activities Recommended for Consideration

Table 3 illustrates the nexus of the OBMP goals, the impediments to achieving these goals, the activities to remove the impediments, and the potential outcomes (i.e. the implications) of implementing each activity. Table 3 also shows the nexus of each activity to addressing the issues needs and wants of the stakeholders, categorized by basin management issues. In the process of developing Table 3, it was identified that some of the activities defined in Table 2 are related enough to be combined into single activities. The 12 activities were condensed into eight activities. The statements of impediments, expected outcomes, and grouping of the activities were initially proposed by the 2020 OBMP Update Team, based on stakeholder input in Listening Sessions #1 through #3, and were subsequently revised, based on the feedback obtained from stakeholders during Listening Session #4.

The eight activity groups scoped out herein are:

1. Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge (Activity A).
2. Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, to protect or enhance Safe Yield, and to improve water quality (Activity B)
3. Maximize the reuse of recycled water produced by the IEUA and others (Activity D).
4. Develop and implement a water-quality management plan to address current and future water-quality issues, protect beneficial uses, and develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits (Activity EF).
5. Develop a management strategy within the salt and nutrient management plan to ensure ability to comply with dilution requirements for recycled water recharge (Activity K).

6. Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence and to optimize the use of all water supply sources (Activity CG).
7. Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance (Activity L).
8. Develop a process to provide for the equitable distribution of the costs and benefits of the OBMP Update, to encourage regional partnerships for implementation to reduce costs, and to identify and pursue low-interest loans, grants, or other external funding sources to support the implementation of the OBMP Update (Activity HIJ).

3. Scope of Work to Perform Proposed 2020 OBMP Update Activities

In this section, each of the eight activities identified by the stakeholders will be described in detail. The potential outcomes Table 3 provide the basis for intended scope of each activity. For each activity the following is described:

- Description of the activity
- Need and function of the activity
- Relationship to the PEs in the 2000 OBMP and OBMP IP
- Scope of work to perform the activity
- Schedule of the implementation actions
- Budget-level cost estimate to implement the initial implementation actions

Assumptions Applied in Defining the Scope of Work, Schedule, and Cost of the OBMP Activities

In order to develop the scope of work, schedule, and cost of the activities, the following assumptions were made:

Basis for scope of work and cost. The scopes of work and associated costs to perform the 2020 OBMP Update activities are based on the current understanding of the stakeholders' desired outcomes as articulated during the 2020 OBMP Update listening sessions and described in Section 2 in this TM1. The precise scopes of work and costs defined in this section are preliminary and will likely change during implementation. Each scope of work includes an introductory process to refine the objectives of the activity and to refine the scope of work, schedule, and costs, as necessary. The scopes of work will be performed by engineers hired by Watermaster, the IEUA or others responsible for implementing the OBMPU.

Estimated costs of engineering services. The estimated engineering services costs are based on 2019 WEI rates and rounded to the nearest $1,000. The estimated costs will need to be adjusted in implementation based on the final recommended scope and schedule.

Participating agency costs are not included. The staff labor costs and other direct costs incurred by agencies participating in the activities are not included in the implementation cost estimates contained herein.

Stand-alone costs. The recommended scope of work and cost for each OBMP activity were developed assuming that the activities were unrelated, or that they could be implemented independently. Once the final set of activities and scopes are selected for inclusion in the 2020 OBMP Update, the scopes will be reviewed to identify overlapping tasks among the activities and will be refined to integrate the work and reduce costs.

Existing OBMP activities. The recommended scopes of work assume that the ongoing activities of the 2000 OBMP and the 2007 supplement to the OBMP IP will continue unless otherwise specified, including, the Recharge Master Plan updates, the ongoing monitoring program under PE1, the Ground Level Monitoring Program, the maximum benefit salt and nutrient management plan, and the Prado Basin Habitat Sustainability Program.

Leveraging existing work. The recommended scopes of work and costs were assumed to leverage existing work being performed by Watermaster, such as the Safe Yield recalculation. There may be opportunities to leverage work done by other agencies to reduce the cost of implementing the recommended scope of work. In implementation, when the activity objectives and scopes of work are being refined, the ability to leverage the work of others would need to be identified and considered to eliminate redundancies and reduce cost.

Schedule. Unless otherwise stated, the schedule to implement the activities is provided in a general context (Year 1, Year 2, Year 5, etc.) and not assigned to a specific start or end date.

Activity A

Description of Activity A

Activity A defined by the stakeholders is:

> *Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental waters, particularly in areas of the basin that will promote the long-term balance of recharge and discharge.*

Activity A has the following objectives: (1) to maximize stormwater capture pursuant to Watermaster's diversion permits, (2) to promote the long-term balance of recharge and discharge, (3) to ensure sufficient supplemental water recharge capacity for future replenishment, (4) to reduce dependence on imported water by maintaining or enhancing Safe Yield, (5) to improve water quality, and (6) to ensure a supply of dilution water to comply with recycled water recharge permit requirements. For the remainder of this section, the use of the term "recharge" is inclusive of diverting, storing, and recharging storm and supplemental waters.

Through the listening session process, the stakeholders identified the following as potential outcomes of performing Activity A:

- Increase recharge of high-quality stormwater that will:
  - protect/enhance Safe Yield,
  - improve water quality,
  - reduce dependence on imported water,
  - increase pumping capacity in areas of low groundwater levels and areas of subsidence concern, and
  - provide new supply of blending water to support the recycled-water recharge program.
- Provide additional supplemental-water recharge capacity for replenishment and the implementation of Storage and Recovery Programs.
- Provide additional surface water storage capacity.

Activity A has similar objectives to those of PE 2 of the 2000 OBMP – *Develop and Implement Comprehensive Recharge Program*. PE2 was included in the 2000 OBMP to reverse the loss of yield caused by urbanization and the concrete lining of natural streams overlying the Chino Basin. The scope of work defined under PE2 was to continue the recharge master plan study initiated by Watermaster and the Chino Basin Water Conservation District (CBWCD) in 1998. The implementation plan for PE2, as defined in the Peace Agreement, requires the preparation of a recharge master plan update (RMPU) at least every five years.

The objectives and scope of each RMPU are defined at the beginning of each update and are derived from several guiding documents: the Peace Agreement, the Peace II Agreement, and the Special Referee's December 2007 Report. Pursuant to these guiding documents, the general objectives of the RMPU include:

- Ensure there is enough recharge capacity and supplemental water available to meet future replenishment requirements. Pursuant to the Judgment, there must be enough wet-water recharge capacity available to Watermaster to ensure it can replenish the basin with supplemental water to offset overproduction. The wet-water recharge capacity for replenishment must include consideration of the availability of supplemental water supplies, competing uses for the recharge facilities, and the need to balance recharge and discharge in every area and subarea.

- Maximize the recharge of recycled and storm waters where feasible. Both of these supplies are reliable: they are under local control and are less costly when compared to imported water supplies.
- Balance the recharge and discharge in every area and subarea. This provision in the Peace Agreement was included to enable Watermaster to use its discretion when conducting recharge and replenishment operations to prioritize the location and magnitude of recharge and replenishment to improve the Hydrologic Balance, to ensure pumping sustainability, and to help manage land subsidence.

To meet these objectives, the RMPUs must consider and address recharge requirement projections, the availability of storm and supplemental waters for recharge and replenishment, and the physical means to satisfy these recharge projections. To the extent that new or modified facilities are required to meet the objectives, the RMPUs include a schedule for planning, design, and construction of recharge improvements. The 2002 Recharge Master Plan and subsequent RMPUs (2010, 2013, and 2018) were developed in open and transparent planning processes that were convened by Watermaster. As part of the *2013 Amendment to the 2010 RMPU* (2013 RMPU), the RMPU Steering Committee was created to assist Watermaster and the IEUA in preparing RMPUs. The Steering Committee is open to all interested stakeholders and meets regularly through the development of RMPUs. Since the implementation of the OBMP began, Watermaster has achieved the following through the RMPU process:

- Modified seventeen existing flood retention facilities to increase diversion rates, conservation storage, and recharge, and constructed two new recharge facilities. These improvements increased average annual stormwater recharge by about 9,500 acre-feet per year (afy). The cost of these recharge improvements was about $60 million, IEUA and Watermaster paid for about half of this cost, while the other half was funded through Proposition 13 grants and other grant programs.
- Completed the design of five recharge improvement projects, expected be completed and in operation by 2021. These projects are expected to increase average annual stormwater recharge by an additional 4,700 afy.
- Ensured sufficient supplemental water recharge capacity is available to meet its Replenishment Obligations through 2050.

The next RMPU must be completed and submitted to the Court by October 2023. Based on the alignment of the objectives of Activity A with those of the RMPU, Activity A can be accomplished through the existing RMPU process. The sections below describe the limitations of the existing RMPU process to fully achieve the objectives of Activity A and the recommended scope to refine the RMPU process to accomplish the objectives.

Need and Function of Activity A

Watermaster holds three permits with the State Water Resources Control Board (State Board) for the diversion and recharge of stormwater in trust for the Parties. The San Bernardino County Flood Control District (SBCFCD) is a co-permittee for two of these permits, 19895 and 20753. Each permit defines a maximum diversion limit and the period over which diversions are allowed to occur each year (diversion season):

- Permit 19895 has a diversion limit of 15,000 acre-feet (af) from November 1 to April 30,
- Permit 20753 has a diversion limit of 27,000 af from October 1 to May 1, and
- Permit 21225 has a diversion limit of 68,500 af from January 1 to December 31.

When combined, these permits allow up to 110,500 af per year (afy) of diversion and recharge. Exhibit A-1 shows the locations where stormwater may be diverted from the stream systems (points of diversion [PODs]) as defined in Permits 19895, 20753, and 21225. The PODs for Permit 19895 are located on the Day Creek system, the PODs for Permit 20753 are located on the San Sevaine Creek system, and the PODs for Permit 21225 are located on the San Antonio/Chino Creek, Cucamonga Creek, Day Creek, and San Sevaine Creek systems. Permit 21225 includes PODs that are also listed in Permits 19895 and 20753, but expands the allowable diversion season.

From 2003 to 2005, Watermaster, working in collaboration with the IEUA, constructed the first set of recharge facilities to exercise its rights pursuant to these permits, increasing average annual stormwater recharge by about 9,500 afy. In 2013, Watermaster and the IEUA completed the 2013 RMPU, which included five new recharge facility improvement projects. As of this writing and as stated above, Watermaster and the IEUA are completing the final design/construction of the 2013 RMPU facilities, and they should be online in 2021. These facilities are expected to increase stormwater recharge by about 4,700 afy.[6] Upon completion of the 2013 RMPU facilities, the annual average stormwater recharge performed pursuant to these three permits is expected to be about 14,950 afy.[7] Exhibit A-2 shows the locations of the existing and planned facilities.

Exhibit A-3 lists the existing recharge facilities and shows the historical average stormwater recharge from 2005 to 2018, the theoretical maximum supplemental water recharge capacity, and the total theoretical maximum recharge capacity for each facility. As shown in Exhibit A-3, actual stormwater recharge has averaged about 10,150 afy which is about 10 percent of the combined diversion limit and 15 percent of the total theoretical maximum recharge capacity. The differences between the historical average stormwater recharge and the diversion limit and total theoretical maximum recharge capacity suggests lost opportunity for stormwater recharge. Because the existing diversion structures are used at their instantaneous capacities, the limitations to increasing the capture and recharge of stormwater are diversion capacity and storage capacity. Hence, Activity A has been identified to increase the capacity to divert, store, and recharge additional surface water.

Availability of Additional Stormwater for Recharge

To better understand the lost opportunity for recharge, Watermaster used its Wasteload Allocation Model (WLAM) to estimate the daily stormwater discharge available for diversion over each permit's respective diversion season, based on the historical hydrology for the 63-year period of 1950 to 2012.[8] The WLAM uses daily precipitation, evapotranspiration, evaporation, and land use data to estimate stormwater discharge entering the stream systems. The WLAM then uses hydraulic design data for channels and stormwater management facilities to computationally route the stormwater discharge through the channels, diversion works, and recharge facilities. The stormwater discharge available for diversion was determined to be the flow at the most downstream PODs on each stream system.

Exhibits A-4 and A-5 show comparisons of stormwater discharge available for diversion, model-estimated stormwater recharge, and permitted diversion limits. Exhibit A-4 presents a direct comparison of the annual time series of stormwater discharge—divided into stormwater diverted for recharge and

[6] Note that Watermaster completed its 2018 RMPU in October 2018, but no projects were selected for implementation.

[7] 2018 Recharge Master Plan Update. WEI. September 2018.

[8] WEI. (2018). *Support for Watermaster's response to State Board request for information for petition for extensions of time.* Prepared for Chino Basin Watermaster. March 7, 2018.

stormwater not diverted for recharge—and the total annual diversion limit. Exhibit A-5 presents a cumulative frequency plot that shows: (1) the probability that stormwater discharge is equal to or greater than a specified value, (2) the probability that stormwater recharge for existing and projected 2013 RMPU facilities is equal to or greater than a specified value, and (3) the permitted diversion limit. Based on Exhibit A-5, the theoretical average annual stormwater discharge is estimated to be about 74,000 afy and the projected average annual stormwater recharge with existing and projected 2013 RMPU facilities is about 14,500 afy. The difference between these two values, 60,000 afy, is the lost opportunity for stormwater recharge.

Through the RMPU process, the Steering Committee analyzes and recommends projects that can increase stormwater diversion and storage capacity and increase stormwater recharge, up to the permit limit, for Watermaster approval. Historically, Watermaster and the IEUA have selected projects for implementation only if the melded unit cost of stormwater recharge resulting from the projects was less than the avoided unit cost of purchasing imported water from the Metropolitan Water District of Southern California (Metropolitan). Over time, more expensive stormwater recharge projects will meet the criteria as the unit cost of imported water increases in the future. The use of this economic criterion alone ignores the economic value of the greater reliability of stormwater relative to imported water.

Exhibit A-6 lists the potential new stormwater recharge projects evaluated in the 2018 RMPU. The locations of these potential projects are shown in Exhibit A-7. The projects listed in Exhibit A-6 were reviewed, and their capital and unit stormwater recharge costs were projected to 2023 costs, which is the year when the next RMPU is due to be completed. The unit cost of new stormwater recharge for the projects listed in Exhibit A-6 ranges from $2,000 to $6,000 per af, and the estimated new stormwater recharge from these projects ranges from 7 to 5,000 afy. Exhibit A-8 is a time history chart showing the historical and projected cost of imported water purchased from Metropolitan compared to the projected unit stormwater recharge cost of the projects shown in Exhibit A-6. In all cases, the projected unit cost of new stormwater recharge projects listed in Exhibit A-6 exceeds the projected cost of imported water that could be supplied by Metropolitan in 2023 (about $900 per af[9]) and through the foreseeable future. Based on Watermaster and the IEUA's historical selection process, no project in Exhibit A-6 was recommended for implementation in the 2018 RMPU. To accomplish the goals of Activity A, the economic criteria for selecting projects would have to be reevaluated.

Supplemental Recharge Capacity

As part of the RMPU process, Watermaster also needs to ensure that there is sufficient supplemental water recharge capacity in the basin to meet Replenishment Obligations. As shown in Exhibit A-3, the theoretical maximum supplemental water recharge capacity under the current IEUA maintenance operations averages about 56,000 afy.[10] For comparison, during FY 2017/18, about 47,000 af of supplemental water was recharged in spreading basins, using about 85 percent of the existing supplemental water recharge capacity. This suggests that new recharge facilities and/or improvements to existing facilities may be needed if Parties want to increase supplemental water recharge.

Balance of Recharge and Discharge

Historically, Watermaster has attempted to manage the recharge of storm and supplemental water to promote the balance of recharge and discharge. This method of managing recharge does not specifically

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[9] WEI. (2018). *2018 Recharge Master Plan Update*. Prepared for the Chino Basin Watermaster. September 2018.

[10] This estimate corresponds to continuous use between maintenance periods and is less than the recharge capacity that would occur if the recharge basins were used less frequently.

address current basin management issues, such as existing land subsidence in Management Zone 1 (MZ1) and parts of MZ2 and pumping sustainability issues in the Jurupa Community Services District (JCSD) and Chino Basin Desalter Authority (CDA) well fields. There is a need to define additional criteria on how and where to conduct recharge to better address existing basin management issues.

Summary

Based on the information summarized herein, the opportunities and challenges in conducting Activity A are:

- The theoretical average annual stormwater discharge available for diversion under the existing water rights permits is about 74,000 afy ranging from 21,400 to 110,500 afy (combined permitted diversion), and existing facilities divert about 14,500 afy. The difference between these two values, about 60,000 afy, is a lost opportunity for stormwater recharge. Improvements to existing facilities and/or new facilities are required to achieve the stormwater recharge potential.
- Based on Watermaster and the IEUA's existing economic selection criteria, no new recharge projects were recommended for implementation in the 2018 RMPU. To accomplish the goals of Activity A, the economic criteria for selecting projects needs to be reevaluated.
- The criteria on how and where to conduct recharge needs to be updated to more effectively address the existing basin management issues, including: land subsidence, maintaining Hydraulic Control, and pumping sustainability.

These challenges can be addressed through the existing RMPU process. The section below describes the recommended scope for developing the 2023 RMPU, refined from past RMPU scopes, to better meet the current needs of the Parties defined for Activity A.

Scope of Work for Activity A

Activity A—*Construct new facilities and improve existing facilities to increase the capacity to store and recharge surface water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge*—will be accomplished through the RMPU implementation process. The scope of work summarized below is for developing the 2023 RMPU and conducting the necessary work to achieve the objectives of Activity A. The scope of work consists of five tasks:

- Task 1 – Define objectives and refine scope of work
- Task 2 – Develop planning, screening, and evaluation criteria
- Task 3 – Describe recharge enhancement opportunities
- Task 4 – Develop reconnaissance-level engineering design and operating plan
- Task 5 – Plan, design, and construct selected recharge projects

Task 1 – Define objectives and refine scope of work. The objective of this task is to obtain consensus on the objectives of Activity A and the impediments this activity is meant to overcome. During this process, the Steering Committee will address questions raised by stakeholders during the OBMP Update, such as:

(1) Should Watermaster have a process in Activity A to identify vacant land for purchase even if there is no specified project or it becomes available outside the "call for projects" window of the RMPU process?
(2) Should Watermaster have a process to encourage developers to utilize infiltration to manage on-site runoff pursuant to the Municipal Storm (MS4) permit?

A detailed scope, cost, and schedule will be prepared to meet the defined objectives. Two meetings will be conducted (1) to define the objectives and impediments and (2) to define the scope, cost, and schedule.

Task 2 – Develop planning, screening, and evaluation criteria. The objectives of this task are to develop criteria to determine how and where new recharge capacity can be constructed and to evaluate and select a subset of projects to evaluate. The criteria developed to evaluate potential projects in Task 4 will include qualitative criteria, such as reliability, and quantitative criteria that include business case evaluations, expressed as net present value, unit cost, and others. The recharge projects with the best cost-benefit ratio at the time were constructed in earlier recharge improvement efforts in the 2000 OBMP implementation. The types of new stormwater projects required to meet the objectives described herein and subsequently refined in Task 1 will likely be more expensive than the avoided cost of purchasing imported water from Metropolitan. The Steering Committee will (1) review and refine criteria used in past RMPUs and (2) review the current projected basin management challenges to develop "smart" recharge criteria. The smart recharge criteria will ensure that project designs and operations are complementary to other Watermaster management activities, such as protecting and enhancing Safe Yield, management of land subsidence, promoting pumping sustainability, ensuring dilution supplies to comply with recycled water recharge permits, water quality improvement, maintenance of Hydraulic Control, and others.

Included in this scope is estimating future Replenishment Obligations, updating the estimated supplemental water recharge capacity, and characterizing the availability of imported and recycled water. Future Replenishment Obligations will be estimated in the 2020 Safe Yield recalculation effort and will be subsequently used as a criterion for planning supplemental water recharge. Two meetings will be scheduled to review and refine the criteria with the stakeholders.

Task 3 – Describe recharge enhancement opportunities. The objectives of this task are to identify potential projects, to screen them using the criteria developed in Task 2, and to subsequently develop a set of stormwater and supplemental water recharge projects for detailed evaluation. Two meetings will be conducted: (1) to develop a list of potential projects that can be implemented and (2) to review the screening of the projects defined during the first meeting and select projects to evaluate in Task 4.

Task 4 – Develop reconnaissance-level engineering design and operating plan. The objective of this task is to characterize the performance and costs of new recharge projects—individually and as a group/system. A reconnaissance-level engineering design and operating plan will be developed for each project. Each project design will include the approximate size, location, and alignment of major stormwater utilities, and will describe any potential implementation barriers. A cost opinion, stormwater recharge performance, and supplemental water recharge capacity will be determined for each project. The task includes evaluating the projects based on the criteria developed in Task 2 and recommending a set of projects for implementation. The deliverable of this task will be the *2023 Recharge Master Plan Update* report, summarizing the work performed under Tasks 1 through 4, and it will include an implementation plan and a plan to finance the preliminary design and CEQA documentation. Four meetings will be conducted: (1) to review the designs and estimated benefits of the projects, (2) to review the evaluation of the projects based on the criteria developed in Task 2 and the recommended list of projects for implementation, (3) to review the implementation plan, and (4) to review the 2023 RMPU report.

Task 5 – Plan, design, and construct selected recharge projects. The objective of this task is to implement the recommendations from the 2023 RMPU report. This task includes (1) developing and implementing necessary agreements between participating Parties, (2) preparing the preliminary design of the recommended recharge projects, (3) preparing the environmental documentation for the recommended recharge projects that will tier off the 2020 OBMP Update PEIR, (4) preparing a financial plan for constructing the recommended recharge projects, (5) preparing final designs of the recommended recharge projects, (6) acquiring necessary permits for constructing and operating the recommended recharge projects, and (7) constructing the recommended recharge projects.

Future Tasks – Repeat Tasks 1 through 5 every five years as required by the Court

Cooperative Efforts with Appropriate Entities to Implement Activity A

The IEUA, Watermaster, the CBWCD, and the SBCFCD are partners in conducting recharge in the Chino Basin. The four agencies have an agreement to implement the existing recharge program. They also collaborate to update the recharge master plan at least every five years with the guidance of the Steering Committee. Activity A will be achieved within the existing RMPU process and will maintain the existing institutional organization as follows:

- ***Watermaster***: Leads the stakeholder process to define the objectives in Task 1, to develop the criteria in Task 2, and to estimate the recharge benefit of the projects using the its existing modeling tools in Task 4.
- ***IEUA***: Leads the development of the list of projects for evaluation in Task 3 and preparing cost opinions for the projects in Task 4. Additionally, the IEUA will collaborate with Watermaster in leading Tasks 1 and 2.
- ***CBWCD***: Collaborates with Watermaster in leading Tasks 1 and 2. The CBWCD is responsible for reviewing and permitting all of the engineering designs developed under Task 5 for their facilities.
- ***SBCFCD***: Collaborates with Watermaster in leading Tasks 1 and 2. The SBCFCD is responsible for reviewing and permitting all of the engineering designs developed under Task 5 for their facilities.

The four Parties will continue to collaborate in the RMPU process and in conducting recharge in the Chino Basin.

Implementation Actions, Schedule, and Costs for Activity A

The recommended schedule to complete the scope of work described herein is described below:

Year one (FY 2020/21):

- Convene Steering Committee.
- Conduct a meeting regarding “current conditions” of groundwater recharge.
- Define objectives of Activity A and the RMP update (Task 1):
    - Define scope and schedule of RMP update.
- Develop criteria on how and where to conduct recharge (Task 2).
- Develop new criteria for evaluation and selection of recharge projects (Task 2).

Year two (FY 2021/22):

- Develop list of projects for evaluation (Task 3).
- Conduct a reconnaissance-level engineering study for the proposed projects (Task 4).

Year three (FY 2022/23):

- Select project(s) for implementation (Task 4).
- Prepare 2023 RMPU Report (Task 4).

Year four (FY 2023/24):

- Watermaster approves the 2023 RMPU Report by October 2023.
- Watermaster and the IEUA project implementation agreement. The objective of this agreement is to define the roles of Watermaster and the IEUA in the planning, permitting, design, and implementation of the projects, and the financing plan.

- SBCFCD and CBWCD Agreement. The Parties to this agreement include the SBCFCD, Watermaster, and the IEUA and potentially others. The objectives of this agreement are to define the terms and conditions to jointly explore and construct new conservation works on SBCFCD and IEUA properties and to conduct flood control and water conservation activities utilizing those same conservation works. The agreement will define the project sites, facility improvements, construction and maintenance cost allocations, user or license fees, operating criteria (with flood control purposes taking priority over conservation for joint use facilities), and other conditions. The SBCFCD will require Watermaster and the IEUA to fund SBCFCD engineering studies and analyses to demonstrate that all conservation improvements at flood control facilities will not negatively impact the operation and maintenance of SBCFCD facilities or reduce the level of the designed flood protection. All engineering studies and analyses shall be done and provided to SBCFCD for review and approval, and an encroachment permit shall be obtained from SBCFCD before the construction of any conservation improvements can commence. The SBCFCD will require that all applicable Environmental Agencies' permits and approvals be obtained and submitted to the SBCFCD before an encroachment permit can be issued.
- Agreement with property owners. Develop an agreement among a property owner, the IEUA, and Watermaster on the terms for use of land where land is required for a recharge project.
- In addition to these agreements, Watermaster will determine whether it is necessary to submit a Petition for Change with the State Board for selected projects that are not included in the Watermaster's current diversion permits. The duration of the Petition for Change process is unknown but would likely be more than one year.

Years five and six (FY 2024/25 and FY 2025/2026):

- Preliminary design of recommended projects. The level of design will be such that it enables the preparation of environmental documentation pursuant to CEQA, provides information for identifying and acquiring construction and related permits, and produces updated New Yield and cost estimates.
- Prepare environmental documentation for recommended projects. CEQA will cover the recommended projects at the project level and the deferred projects at a programmatic level, based on the project descriptions developed in Task 5. This documentation will tier off from the 2020 OBMP Update programmatic environmental impact report. Watermaster will conduct a MPI analysis in parallel with the CEQA process.
- Begin 2028 RMPU process (first year of the 2028 RMP update).

Years seven and eight (FY 2026/27 and FY 2027/28):

- Prepare Final Designs and Acquire Necessary Permits for the Selected Projects.

Years nine and ten (FY 2028/29 and FY 2029/30):

- Construct 2023 RMPU Selected Projects.

Exhibit A-9 shows the estimated budget-level engineering cost to complete Tasks 1 through 4, which is about $575,000. The cost of Task 5 cannot be estimated until the completion of Task 4. Exhibit A-9 also shows how Tasks 1 through 4 and their associated costs will be scheduled over the first three years of implementation. Note that because Watermaster and the IEUA are required to complete the RMPU at least every five years, the cost to perform the Activity A scope of work is not a new cost to the Parties.

Activity B

Description of Activity B

Activity B defined by the stakeholders is:

> *Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality.*

The objective of Activity B is to develop and implement Storage and Recovery Programs in the Chino Basin that provide defined benefits to the Parties and the basin.

Through the listening session process, the stakeholders identified the following desired outcomes from Activity B:

- Storage and Recovery Programs that are optimized: to protect/enhance Safe Yield, to improve water quality, to avoid land subsidence, to ensure balance of recharge and discharge, and to maintain Hydraulic Control.
- Leverage unused storage space in the basin.
- Reduce reliance on imported water, especially during dry periods.
- Potentially provide opportunity for outside funding sources to implement the OBMP Update.

The Judgment recognized the existence of unused storage space within the Chino Basin that could be used by a person or a public entity to store water for subsequent beneficial use. The Judgment requires that the use of such storage capacity be undertaken only under Watermaster control and regulation to protect all stored water, to protect Safe Yield, and to avoid adverse impacts to groundwater pumpers. The Judgment prioritizes the use of storage space by the Parties over the use of storage space for the export of stored water.

The Peace Agreement defined a " Storage and Recovery Program" as the use of available storage capacity in the Chino Basin by any person to store supplemental water in the basin pursuant to a Groundwater Storage Agreement with Watermaster, including the right to export that water for use outside the basin.

Activity B has similar objectives and desired outcomes to those of PE 9 of the 2000 OBMP—*Develop and Implement Storage and Recovery Programs*. PE 9 was included in the 2000 OBMP to implement Storage and Recovery Programs to “benefit all Parties in the basin and ensure that basin waters and storage capacity are put to maximum beneficial use while causing no MPI to any producer or the basin.” The implementation plan for PE 9 was combined with PE 8—*Develop and Implement Groundwater Storage Management Program*—in the OBMP IP and Peace Agreement.

The OBMP IP included a storage management plan that allowed the Parties to utilize a 500,000 af band of storage space in the basin and requires them to mitigate adverse impacts from its use. In 2017, the IEUA adopted an addendum to the 2010 Peace II SEIR that provided a temporary increase in the useable storage space to 600,000 af through June 30, 2021. Pursuant to the OBMP IP, Watermaster shall: (1) prioritize its efforts to regulate and condition Storage and Recovery Programs for the mutual benefit of the Parties and (2) give first priority to proposed Storage and Recovery Programs that provide broad mutual benefits to the Parties.

In 2018, Watermaster conducted a *Storage Framework Investigation*,[11] where future projections of the use of storage were estimated and evaluated for potential MPI. The *Storage Framework Investigation* projected that MPI could occur due to the implementation of prospective Storage and Recovery Programs and described potential facilities and operating concepts that, if implemented, would minimize potential MPI. The *Storage Framework Investigation* is being used to inform the development of the *2020 Storage Management Plan*. The *2020 Storage Management Plan* is in preparation, and when completed, it will inform the development of future Storage and Recovery Programs.

Need and Function of Activity B

Activity B describes the Parties' desires to implement "optimized" Storage and Recovery Programs that avoid potential MPI and provide benefits, such as:

- *Increased water-supply reliability*. Imported water is stored in the basin during times of imported-water surplus and can be recovered during times of water-supply shortage (e.g. prolonged drought, imported water shortages/outages, etc.) to supplement local supplies.
- *Protected or enhanced Safe Yield*. The operation of Storage and Recovery Programs needs to be implemented to minimize reductions in net recharge and potentially increase net recharge to the basin.
- *Improvements to water quality.* Recovery operations could be programmed to occur in areas of impaired water quality, thereby removing groundwater contaminants. This would require groundwater treatment facilities. Supplemental water recharge may provide a slight water quality improvement.
- *Reduced cost of OBMP implementation.* Leave behind water, revenue, credits, investment in facilities, external funding, or other contributions produced by a Storage and Recovery Program can be used to offset Watermaster assessments and provide other benefits.

Watermaster, the IEUA, and the Parties have tried to develop and implement Storage and Recovery Programs since the Peace Agreement came into effect in 2000. The first attempt included the issuance of a request for proposals, declaring that the Chino Basin was ready to develop Storage and Recovery Programs with water agencies outside the basin. Very few proposals were received, and the proposals that were submitted did not provide the benefits desired by the Parties.

Metropolitan developed a program called the Dry-Year Yield Program (DYYP) and offered it to its member agencies in the Metropolitan service area. As key feature of the DYYP, Metropolitan offered funding to construct and operate new facilities that would enable Metropolitan to store imported water in a groundwater basin and recover it when needed. In 2003, Metropolitan, the IEUA, Watermaster, and the TVMWD entered into an agreement to implement a 100,000 af DYYP in the Chino Basin that was consistent with the DYYP parameters required by Metropolitan. The DYYP is the only Storage and Recovery Program that has been implemented within the Chino Basin since 2000, and the DYYP agreement expires in 2028. As part of the DYYP, the Parties received compensation from Metropolitan for the construction and operation of numerous facilities across Chino Basin that are used for recovery operations during "take" cycles of the DYYP. The Parties can use these facilities for their own purposes at all other times. In 2010, Metropolitan, the IEUA, Watermaster, and the TVMWD began discussions to expand the DYYP to 150,000 af of storage but decided against expansion. The Parties have expressed that the DYYP presented an opportunity to fund certain capital improvement projects that added groundwater

[11] WEI. (2019). *Storage Framework Investigation – Final Report*. Prepared for the Chino Basin Watermaster. October 2018, revised January 2019.

pumping capacity; however, the anticipated long-term benefits, such as improved water-supply reliability through dry periods, were not sufficiently planned for and agreed upon during the development of DYYP and ultimately were not realized by the Parties.

Currently, there are two new efforts underway to develop Storage and Recovery Programs: (1) the Chino Basin Water Bank being developed by some of the Parties and the IEUA and (2) the Chino Basin Program (CBP) being led by the IEUA. The latter is in response to a $207 million conditional funding opportunity awarded to IEUA under Proposition 1 for the construction and operation of storage programs that create environmental benefits in the Sacramento-San Joaquin Delta, while providing local water quality benefits.

Summary

What is common to all past efforts to develop and implement Storage and Recovery Programs is the belief that Chino Basin storage is a valuable resource that can and should be leveraged to benefit the Parties. What was missing in past efforts was an initial effort to clearly articulate the objectives of the Parties and the required benefits to be realized from Storage and Recovery Programs.

Activity B should follow a more deliberate planning process that will enable the Parties and their storing partners to select and implement Storage and Recovery Programs that achieve the objectives of the Parties and the desired benefits. To do this, the planning process should answer the following questions:

(1) Why do the Parties want to conduct Storage and Recovery Programs? And, what are the Parties' objectives for Storage and Recovery Programs?

(2) What were the obstacles to implementing Storage and Recovery Programs in the past? How do we avoid or overcome them in the future?

(3) What are the benefits desired by the Parties? How can such benefits be quantified?

(4) What are the potential source waters for Storage and Recovery Programs in the Chino Basin? What is the availability and what are the volumes of these potential source waters?

(5) Who are the entities that would be interested in obtaining water from a Storage and Recovery Programs? How would they take delivery of the stored water?

(6) How could put and take operations be performed to match the availability of the source waters with the demand for the stored water and be consistent with the *2020 Storage Management Plan*?

(7) How can existing infrastructure be used to perform put and take operations? Are new facilities required? What are the capital and O&M costs associated with the use of existing and new facilities?

(8) What are the practical alternatives for implementing Storage and Recovery Programs?

(9) What institutional arrangements are necessary to implement Storage and Recovery Programs?

The Watermaster should convene a Storage and Recovery Program Committee for the purposes of answering these questions and ultimately developing and implementing a *Storage and Recovery Program Master Plan*. The *Storage and Recovery Program Master Plan* will enable the Parties and other potential storing partners: (1) to reference a common set of objectives for Storage and Recovery Programs and align the objectives with requirements in grant applications and other funding opportunities, (2) to assess the potential for implementing Storage and Recovery Programs in the Chino Basin at various scales, (3) to solicit interest in participation in Storage and Recovery Programs, and (4) to develop Storage and Recovery Programs that are consistent with the *2020 Storage Management Plan*.

Scope of Work for Activity B

The scope of work to achieve the objectives of Activity B—*Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality*—is designed to answer the questions listed above and will consist of the following four tasks:

- Task 1 – Convene the Storage and Recovery Program Committee and articulate the program objectives
- Task 2 – Develop conceptual alternatives for Storage and Recovery Programs at various scales
- Task 3 – Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives
- Task 4 – Prepare *Storage and Recovery Program Master Plan*

Prior work has been performed for the *Storage Framework Investigation*, the Chino Basin Water Bank, and the Chino Basin Program. These past efforts can be leveraged after Watermaster completes Task 1. At the end of Task 4, Watermaster and the Parties will have a master plan for Storage and Recovery Programs, know what is reasonably possible, know what is a "stretch" program, and know how to subsequently implement the master plan.

The scope of work described below for Task 1 is a necessary first step. If the Parties cannot agree upon the objectives for Storage and Recovery Programs, Tasks 2 through 4 will not be executed. If the process moves beyond Task 1, the precise scope and level of effort required to perform Tasks 2 through 4 will greatly depend on the outcomes of Task 1. Tasks 2 through 4 are generally described below, but the cost to perform these tasks is not estimated herein. The precise scope of work for Tasks 2 through 4 will be developed in detail as part of Task 1.

Task 1 – Convene the Storage and Recovery Program Committee, define objectives, and refine scope of work. In this task, the Storage and Recovery Program Committee will be convened. The Committee's initial task is to obtain consensus on the objectives and desired benefits of Storage and Recovery Programs and, if consensus is achieved, scope the effort to prepare a *Storage and Recovery Program Master Plan*. To execute this task, the Committee will address the following questions:

(1) Why do the Parties want to conduct Storage and Recovery Programs and what should be their objectives?

(2) What were the obstacles to implementing Storage and Recovery Programs in the past, what are the current objectives, and how we can overcome them in the future?

(3) What are the benefits desired by the Parties and how should they be quantified?

Four Committee meetings will be conducted (1) to define the objectives and impediments, (2) to define a set of mutual benefits that are expected/required from Storage and Recovery Programs, and (3) to develop the preliminary scope, cost, and schedule for the work (Tasks 2 through 4 below) to develop the *Storage and Recovery Program Master Plan*.

Task 2 – Develop conceptual alternatives for Storage and Recovery Programs at various scales. The objective of this task is to describe a set of conceptual alternatives for Storage and Recovery Programs at various scales that will achieve the objectives defined in Task 1. The set of conceptual alternatives will be described and evaluated in greater detail in Task 3.

To execute this task, the Committee will address the following questions:

(4) What are the potential source waters for Storage and Recovery Programs in the Chino Basin? What is the availability and what are the volumes of these potential source waters?

(5) What entities are interested in obtaining water from a Storage and Recovery Program? How would they take delivery of the stored water?

(6) How could put and take operations be performed to match the availability of the source waters with the demand for the stored water and be consistent with the 2020 Storage Management Plan?

Five to six Committee meetings will be needed to answer these questions, describe various conceptual alternatives for Storage and Recovery Programs, and evaluate and select a set of these alternatives for further development, evaluation, and ranking in Task 3.

Work involved in this task will likely include: (1) collecting, compiling, and reviewing existing and new information; (2) identifying potential source waters for Storage and Recovery Programs in the Chino Basin; (3) characterizing the availability and volumes of these potential source waters; (4) identifying the entities that would be interested in obtaining water from a Storage and Recovery Programs; (5) characterizing how the entities would take delivery of the stored water; (6) identifying and characterizing institutional challenges to program implementation; (7) developing planning criteria to formulate and rank the conceptual Storage and Recovery Program alternatives; (8) describing several conceptual alternatives for Storage and Recovery Programs of various scales; and (9) selecting a set of alternatives for further development, evaluation, and ranking in Task 3.

Each alternative will describe, at a conceptual level, the operating parameters for put and take operations in the Chino Basin that match the available source waters with the demand for stored water. The alternatives must be consistent with the Watermaster's 2020 Storage Management Plan and the objectives for Storage and Recovery Programs defined in Task 1.

Task 3 – Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives. The objective of this task is to describe and evaluate reconnaissance-level facility plans, operational plans, and cost opinions to implement the various Storage and Recovery Program alternatives described in Task 2.

To execute this task, the Committee will need to answer the following questions:

(7) How can existing infrastructure be used to perform put and take operations? Are new facilities required? What are the capital and O&M costs associated with the use of existing and new facilities?

(8) What are the practical alternatives for implementing Storage and Recovery Programs?

Three to four Committee meetings will be needed to answer these questions and to describe, evaluate, and rank the various Storage and Recovery Program alternatives.

For each alternative, two sub-alternatives will be developed: one alternative that uses both existing and new facilities and one that is based only on new facilities. Potential implementation barriers will be described. Capital and O&M cost opinions will be prepared for each alternative, utilizing criteria developed in Task 2.

To characterize the performance of the Storage and Recovery Program alternatives: (1) the Watermaster's groundwater model will be utilized to estimate the physical response of the basin and to assess the potential for MPI, and (2) the benefits of the Storage and Recovery Program will be quantified and assessed. Each alternative will be ranked using this and any other criteria developed in Task 2.

Task 4 – Prepare Storage and Recovery Program Master Plan. The objective of this task is to prepare a *Storage and Recovery Program Master Plan* that will enable the Parties and other potential storing partners: (1) to reference a common set of objectives for Storage and Recovery Programs and align the objectives with requirements in grant applications and other funding opportunities, (2) to assess the potential for implementing Storage and Recovery Programs in the Chino Basin at various scales, (3) to solicit interest in participation in Storage and Recovery Programs, and (4) to develop storage and recovery programs that are consistent with the *2020 Storage Management Plan*.

The plan will describe the results and recommendations of Tasks 1 through 3 and will include a discussion of the institutional arrangements required to implement Storage and Recovery Programs in the Chino Basin. Three to four Committee meetings will be needed (1) to finalize the discussion on what was learned in prior tasks, (2) to gain consensus on the recommendations, and (3) to review, revise, and finalize the *Storage and Recovery Program Master Plan*.

Cooperative Efforts with Appropriate Entities to Implement Activity B

This is a basin-wide activity that involves the Parties, IEUA, TVMWD, and WMWD. Potential storing partners located outside of the Chino Basin will need to be consulted but need not participate on the Storage and Recovery Program Committee. Watermaster's role will be to convene the Storage and Recovery Program Committee, coordinate and administer its activities and meetings, and ensure that the recommendations derived from this effort are consistent with the Judgment, Peace Agreements and other agreements, the 2020 Storage Management Plan, and the Watermaster Rules and Regulations.

Implementation Actions, Schedule, and Costs for Activity B

The recommended schedule to complete the scope of work described herein is described below:

Year one:

- Convene Storage and Recovery Program Committee and articulate the program objectives (Task 1).

Year two:

- Develop conceptual alternatives for Storage and Recovery Program s at various scales (Task 2).

Year three:

- Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives (Task 3).
- Prepare *Storage and Recovery Program Master Plan* (Task 4).

Year four and thereafter:

- Develop and implement Storage and Recovery Program with guidance and assistance from the *Storage and Recovery Program Master Plan*.
- Update the *Storage and Recovery Program Master Plan* as needed to be consistent with periodic updates to the Storage Management Plan.

Exhibit B-1 shows the estimated budget-level cost opinion to complete Task 1, which is about $105,000. The cost of Tasks 2 through 4 cannot be estimated until the completion of Task 1. Exhibit B-1 also shows how Tasks 1 through 4 will be scheduled over the first three years of implementation.

Activity D

Description of Activity D

Activity D defined by the stakeholders is:

Maximize the reuse of recycled water produced by IEUA and others.

The objective of Activity D is to maximize the reuse of recycled water produced by the IEUA and other publicly owned treatment works (POTWs) in proximity to the Chino Basin to meet future demands and improve local water-supply reliability, especially during dry periods. Expanded reuse activities could include direct non-potable reuse (landscape irrigation or industrial uses), artificial recharge by spreading or injection (indirect potable reuse), and direct potable reuse. Increasing recycled water reuse is an integral part of the OBMP's goal to enhance water supplies, and, the Judgment states that Watermaster shall give high priority to maximizing the beneficial use of recycled water for replenishment purposes (Judgment ¶ 49(a)). The direct use of recycled water increases the availability of native and imported waters for higher-priority beneficial uses.

Through the listening session process, the stakeholders identified the following as potential outcomes of performing Activity D:

- Provide a new, reliable volume of in-lieu and/or wet water recharge that could:
  - Protect or enhance Safe Yield,
  - reduce dependence on imported water,
  - improve water-supply reliability, especially during dry periods, and
  - increase pumping capacity in areas of low groundwater levels and areas of subsidence concern.
- Provide for alternative sources of recycled water that can be used to satisfy the IEUA's requirement to discharge a minimum of 17,000 afy of water to the Santa Ana River pursuant to the Santa Ana River Judgment and associated agreements with the Western Municipal Water District (WMWD).

Activity D has similar objectives to those of PE 5 of the 2000 OBMP—*Develop and Implement Regional Supplemental Water Program*. Recognizing that growth in the Chino Basin was going to result in a more than 30 percent increase in then-current water demands, PE 5 was included in the 2000 OBMP to improve regional conveyance and availability of imported and recycled waters throughout the basin. Recycled water is more reliable than imported water, and using it in lieu of imported water improves the sustainability of Chino Basin and water supply reliability. The implementation plan for PE 5 was combined with PE 3—*Develop and Implement Water Supply Plan for the Impaired Areas of the Basin* in the OBMP and Peace Agreement.

The PE 3/PE 5 implementation action defined in the Peace Agreement related to recycled water reuse was for the IEUA to construct recycled water facilities to meet recycled water demands for direct use and for groundwater recharge. Since 2000, the IEUA has constructed and operated a recycled water conveyance system throughout the basin, enabling it to provide recycled water to its member agencies. Recycled water deliveries grew from about 3,400 afy in 2000 to about 34,000 afy in 2017 and have replaced a like amount of groundwater and imported water that would have otherwise been used for non-potable purposes.

The expansion of the recycled water reuse program was made possible—and economically feasible—through the SNMP activities performed pursuant to PE 7—*Develop and Implement Salt Management Plan*.

The SNMP, discussed as part of Activity K, will be an integral management tool to enable the maximization of recycled water reuse pursuant to Activity D.

Need and Function of Activity D

History of Recycled Water Discharge and Reuse in the Chino Basin

The IEUA owns and operates four wastewater treatment facilities: Regional Plant No. 1 (RP-1), Regional Plant No. 4 (RP-4), Regional Plant No. 5 (RP-5), and the Carbon Canyon Water Reclamation Facility (CCWRF). Recycled water produced by these plants is reused for direct uses, groundwater recharge, and discharged to Chino Creek or Cucamonga Creek, which are tributaries to the Santa Ana River. Exhibit D-1 shows the location of the IEUA's treatment plants, discharge points to surface water, recharge facilities receiving recycled water, and recycled water distribution pipelines for direct use deliveries. Historically, the IEUA's operating plan has prioritized the use of recycled water as follows: (1) to meet the IEUA's discharge obligation to the Santa Ana River (17,000 afy), (2) to meet direct reuse demands for recycled water, and (3) to recharge the remaining recycled water.

Exhibit D-2 shows the time history of the IEUA's annual discharges to the Santa Ana River since FY 1977/78. The increase in recycled water discharges from 20,000 afy in FY 1977/78 to about 60,000 afy by FY 1996/97 is illustrative of the population growth in the Chino Basin over this period. Although recycled water had been reused since the 1970s, the growth of IEUA's recycled water reuse programs started in 1997. Total recycled water discharge remained at 60,000 afy through 2005 after which it declined as a result of OBMP implementation. Specifically, the incorporation of Watermaster and the IEUA's maximum benefit SNMP into the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) in 2004, triggered the ability to rapidly increase recycled water reuse. Since 2014, recycled water discharge has been less than 20,000 afy and has averaged about 18,600 afy over the last five years.

Exhibit D-3 characterizes the total reuse of recycled water for direct use and recharge in the Chino Basin from FY 1996/97 through FY 2017/18. When the OBMP was completed in 2000, the IEUA was recharging about 500 afy of recycled water and utilizing about 3,200 afy for non-potable direct uses. Recycled water reuse peaked at about 38,200 af in FY 2013/14. Total recycled water reuse in the Chino Basin declined about 5,600 to 32,700 af in FY 2017/18.

Direct Reuse. Recycled water from the IEUA's facilities is reused directly for: irrigation of crops, animal pastures, freeway landscape, parks, schools, and golf courses; commercial laundry and car washes; outdoor cleaning and construction; toilet plumbing; and industrial processes. The direct use of recycled water increased from about 3,500 af in FY 1999/00 to about 24,600 af in FY 2013/2014 and has since declined to about 19,400 af as of FY 2017/18. The recent decline is due to the mindful reduction in use by the City of Chino to accommodate changes in IEUA policy related to the use of recycled water base entitlements and conversions of land from agricultural to urban uses. Exhibit D-4 is a map of IEUA's recycled water deliveries for direct use in FY 2017/18.

Recharge. In 2005, the IEUA initiated its recycled water recharge program and recycled water has since become an important component of annual recharge to the Chino Basin. In FY 2017/18, recycled water recharge was 13,200 af and has averaged about 13,000 afy over the past five years. The locations of the recharge facilities receiving recycled water are shown in Exhibit D-4.

Recycled Water Reuse Projections and the Availability of Additional Recycled Water for Reuse

The IEUA is continuing to expand its recycled-water distribution system and recharge facilities throughout the Chino Basin for direct non-potable uses and recharge. Growth is still occurring in the Chino Basin and will result in additional wastewater flows to the IEUA's treatment plants. Much of this supply will be used to meet increasing non-potable demands as the currently remaining agricultural land uses convert to urban uses. The increasing demand for recycled water reuse will constrain the IEUA's ability to continue to use recycled water to meet its discharge obligations pursuant to the Santa Ana River Judgment.

Projected Recycled Water Supplies and Demands. Exhibit D-5 shows the IEUA's latest projections of recycled water production, expressed as a range (low and high) and projections of direct reuse and recharge through 2040.[12] Also shown in Exhibit D-5 is the calculation of surplus supply available for expanded reuse and/or discharge. Under the "high" recycled water production projections, there is sufficient surplus supply to meet the Santa Ana River discharge obligations and expand recycled water reuse. Under the "low" recycled water production projections, there is insufficient supply to meet the Santa Ana River discharge obligations through at least 2025, suggesting that the IEUA may need to find supplemental supplies to meet both recycled water demands and its discharge obligations.

Supplemental recycled water supply. In addition to the recycled water available from the IEUA, other nearby POTWs are not currently reusing recycled water and may have surplus recycled water that could be acquired and conveyed to the Chino Basin. The surplus recycled water from these POTWs could be utilized to increase reuse in the Chino Basin if it is economical to convey the water to the desired end uses or used to meet discharge obligations. The nearby POTWs with potential surplus supply include the Pomona Water Reclamation Facility (WRF), the Western Riverside County Regional Wastewater Authority (WRCRWA), the City of Rialto, RIX, and the City of Riverside. The locations of these facilities are shown in Exhibit D-1. Currently, the availability of recycled water from these or other POTWs is not precisely known.

Capacity for Expanded Recycled Water Recharge at Existing Facilities. As described for Activity A, Watermaster and the IEUA operate a set of recharge facilities in the Chino Basin to conduct storm, recycled, and imported water recharge. The IEUA and Watermaster prioritize[13] the use of these facilities as follows: (1) maximize stormwater capture and recharge, (2) meet Watermaster's replenishment and recharge obligations as required by the Judgment and Peace Agreements, and (3) recharge other supplemental water for groundwater storage and management. Exhibit D-6 shows the theoretical maximum supplemental water recharge capacity[14] that can be used for recycled water recharge, subject to Watermaster's priority need for recharge and replenishment.[15] The table also shows actual FY 2017/18 recycled water recharge (13,200 af) and planned recycled water recharge for FY 2019/20 through FY 2029/30.[16] As the table shows, the planned volume of recycled water recharge of 16,400 af is less than one-half of the theoretical maximum supplemental water recharge capacity. This suggests that there is sufficient capacity to recharge future surplus recycled water supply that will not be used for direct non-potable uses, subject to Watermaster's need for recharge and replenishment and the ability to comply with the dilution requirements defined in Watermaster and the IEUA's maximum benefit SNMP.

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[12] These projections are based on information published by the IEUA to support the development of the Chino Basin Program: *Sources of Water Supply for the Chino Basin Program.* Memo to Member Agencies. February 20, 2019. These projections differ slightly from the latest water supply planning projections published in Watermaster's *Storage Framework Investigation* and the *2018 RMPU*, both of which were published in 2018.

[13] Note that the primary goal of multipurpose facilities is to attenuate flood peak discharge.

[14] There are two estimates of theoretical supplemental water recharge capacity. The first is corresponds to the 10-month period directly after a cleaning. The second corresponds to continuous use between maintenance periods and is less than the recharge capacity that would occur if the recharge basins are used less frequently.

[15] WEI, (2019). *2018 Recharge Master Plan Update*. Prepared for the Chino Basin Watermaster. September 2018.

[16] The projection cited here is based on the recycled water projection included in the 2018 RMPU, which was published before the CBP planning memo projection of 18,700 afy.

Considerations and Challenges for Maximizing Recycled Water Reuse

There are various factors that should be considered in determining how to maximize the reuse of recycled water produced by the IEUA and other POTWs. These are summarized as follows.

Existing Planning Efforts. The IEUA is currently performing planning efforts for the CBP, which is a large Storage and Recovery Program to provide for regional, dry-year water supplies and associated infrastructure. The CBP was conditionally awarded approximately $207 million of Proposition 1 Water Storage Investment Program funding. Over its 25-year project life, the CBP would increase recycled water recharge in the Chino Basin by 15,000 afy, and during dry years, the water in storage would subsequently be recovered and pumped into Metropolitan's system for use in Southern California in lieu of imported water from the State Water Project. The planned sources of recycled water for the CBP are currently being evaluated by the IEUA, but it is certain additional supplies beyond those produced by the IEUA will be needed. The CBP is still undergoing planning and evaluation, and its implementation is not certain. Regardless of whether the CBP is implemented, the significant body of work being led by the IEUA together with regional agencies can be leveraged to accomplish Activity D.

Timing of Recycled Water Availability. A common challenge with maximizing recycled water reuse is the mismatch in the timing of non-potable water demands and recycled water supply availability. It will be important to characterize in detail the seasonality of outdoor water demands and availability of recharge capacity given that surplus recycled water may only be available in winter months when outdoor demand is low and recharge capacity is otherwise being utilized for stormwater recharge. These relationships will also vary based on climate conditions (wet versus dry periods). Fully maximizing recycled water supplies will require an understanding of these complex relationships to optimize the design and operation of projects. Fully maximizing recycled water reuse may require storage facilities.

Salt and Nutrient Management. Watermaster and the IEUA have an existing maximum benefit SNMP that enables the reuse and recharge of IEUA recycled water in the Chino Basin (refer to Activity K for more details). This SNMP, which is incorporated into the Basin Plan for the Santa Ana Region, did not contemplate the use of non-IEUA sources of recycled water in the Chino Basin. Some of the available recycled water sources have TDS and/or nitrate concentrations that are numerically higher than those of IEUA's current or permitted TDS and nitrate limits, which could impact compliance with the SNMP or trigger additional mitigation measures to protect beneficial uses. Detailed water quality projections would be required to demonstrate the impacts of reuse of non-IEUA sources of recycled water in the Chino Basin. The existing SNMP contains provisions for mitigation at such time that the TDS and/or nitrate concentration of recycled water or groundwater exceeds the regulatory limits defined in the Basin Plan.

Water Quality. Water quality regulations are constantly evolving as new contaminants of potential concern are identified and studied. In recent years, the presence of pharmaceutical and personal care products (PPCPs) in recycled water has been an area of focused research to determine potential health impacts that could result from reuse of recycled water for recharge in groundwater basins. A new set of emerging contaminants of concern is a group of chemicals known as poly- and per-fluorinated compounds (PFAS). PFAS are known to be present in recycled water, and any new regulatory standards for PFAS in drinking water could impact the ability to reuse recycled water without treatment (see discussion in Activity EF for additional details on PFAS).

Direct Potable Reuse (DPR). The direct potable reuse of recycled water, although only currently being done at a very limited pilot scale in California, is emerging as a potential future municipal water supply. The State Board has released a framework for regulating DPR through reservoir and raw water augmentation, but regulatory criteria for DPR projects will not be adopted for many years. The State Board will prioritize developing regulations for reservoir augmentation and will follow with raw water augmentation in the future after more research is completed to determine the criteria necessary to ensure protection of public health. DPR will require advanced treatment of any recycled water source used.

Santa Ana River Judgment. Historically the IEUA has used recycled water to meet its obligations under the Santa Ana River Judgment. As demand for recycled water increases, the IEUA will have to rely on other sources of water to meet this obligation. If the IEUA were able to obtain access to additional water supplies (recycled or other supplemental), alternative plans should be evaluated to optimize which sources are used to ensure that the IEUA meets its annual discharge volume and water quality requirements pursuant to the Judgment.

Summary

The process to achieve the objective of Activity D to maximize the reuse of recycled water produced by IEUA and others should include: (1) a characterization of the availability of all recycled water supplies, (2) a characterization of the direct recycled water demands of the Parties, (3) identification of project opportunities and the planning and screening criteria to evaluate them, and (4) development of reconnaissance-level engineering design and operating plans. This information could then be used to evaluate, prioritize, and select projects for implementation. To optimize the expansion of recycled water reuse, the Parties should convene a Recycled Water Projects Committee for the purposes of evaluating project opportunities and developing a plan to implement them. The Committee could be comprised of representatives from all interested stakeholders and could be led by IEUA, Watermaster, and/or others. The scope of work to implement such a process is described below.

Scope of Work for Activity D

The scope of work to achieve the objectives of Activity D—*Maximize the reuse of recycled water produced by IEUA and others*—consists of six tasks:

- Task 1 – Convene Recycled Water Projects Committee, define objectives and refine scope of work
- Task 2 – Characterize the availability of all recycled water supplies and demands
- Task 3 – Develop planning, screening, and evaluation criteria
- Task 4 – Describe recycled water reuse project opportunities
- Task 5 – Develop reconnaissance-level engineering design and operating plan
- Task 6 – Plan, design, and construct selected recycled water projects

The IEUA already performs various efforts to characterize recycled water supply and demand within its service area, including the periodic update of its Integrated Resources Plan (IRP). And, as previously noted, the IEUA is performing a significant amount of work to evaluate opportunities to acquire surplus recycled water supplies for recharge as part of the CBP, and this work could be leveraged to reduce the effort required to implement the scope of work for Activity D.

Task 1 – Convene Recycled Water Projects Committee, define objectives and refine scope of work. In this task, a Recycled Water Projects Committee will be convened. The Committee's initial tasks are (1) to obtain consensus on the objectives for maximizing recycled water reuse, (2) to refine the preliminary scope of work defined in the 2020 OBMP Update (Tasks 2-7 below), and (3) to update the schedule and cost to perform the work. Two Committee meetings will be conducted to accomplish these tasks.

Task 2 – Characterize the availability of all recycled water supplies and demands. The objectives of this task are: (1) to characterize the future water demands of the Parties to estimate the IEUA's recycled water production, (2) to prepare updated projections of the direct recycled water reuse demands of the Parties, (3) to identify other available sources of recycled water, (4) to characterize the use and potential availability of each recycled water supply (IEUA and others), and (5) to identify the institutional and physical challenges for acquiring each source of surplus supply. The recycled water availability and direct reuse demands will be characterized on a monthly basis for various climate conditions to enable the characterization of potential storage needs to fully maximize recycled water reuse. One meeting will be conducted to review the characterization of recycled water availability.

Task 3 – Develop planning, screening, and evaluation criteria. The objective of this task is to develop the criteria that will be used to evaluate recycled water reuse projects in Tasks 4 and 5. The types of criteria developed to evaluate potential projects will include:

- Watermaster criteria that include no potential MPI, balance of recharge and discharge; and others;
- regulatory criteria that include compliance with salt and nutrient management plans, DDW regulations, and others;
- qualitative criteria that include institutional complexity, reliability of non-IEUA recycled water sources, overall water supply reliability and others; and
- quantitative criteria that include business case evaluations expressed as net present value, unit cost, and others.

Two meetings will be conducted to review and refine the criteria with the Recycled Water Projects Committee.

Task 4 – Describe recycled water reuse project opportunities. The objectives of this task include identifying potential recycled water project alternatives, screening them using the criteria developed in Task 3, and selecting a set of projects for detailed evaluation. Three meetings will be conducted to develop the list of potential projects that can be implemented, to review the screening of the projects, and to select the projects to evaluate in Task 5.

Task 5 – Develop reconnaissance-level engineering design and operating plan. The objective of this task is to characterize the performance and costs of new recycled water projects for reuse, individually and as a group/system. A reconnaissance-level engineering design and operating plan will be developed for each project. Each project design will include the approximate size, location, and alignment of major recycled water utilities, and will describe any potential implementation barriers for the project. A cost opinion will be determined for each project. This task includes evaluating projects based on the criteria developed in Task 2 and recommending a set of projects for implementation. The deliverable of this task will be a technical report that summarizes the work performed under Tasks 1 through 4, and it will include an implementation plan as well as a plan to finance the preliminary design and CEQA documentation. Five meetings will be conducted to review the design and estimated benefit of the projects; review the evaluation of the projects, based on the criteria developed in Task 2, and review the recommended list of projects for implementation; review the implementation plan; and review the technical report.

Task 6 – Plan, design, and construct selected recycled water projects. The objective of this task is to implement the recommendations of the technical report. This task includes (1) developing and implementing necessary agreements between participating Parties, (2) preparing the preliminary design of the recommended projects, (3) preparing the environmental documentation for the recommended projects that will tier-off the 2020 OBMP Update PEIR, (4) preparing a financial plan for constructing the recommended projects, (5) preparing final designs of the recommended projects, (6) acquiring necessary permits for constructing and operating the recommended projects, and (7) constructing the recommended projects.

Task 7 – Periodically re-evaluate availability of recycled water supplies for reuse. As agencies update water supply and demand projections, project economics change, and other changes occur in the Basin, the ability to maximize the reuse of recycled water may also change. As such, Task 2 should be updated periodically. A first step in this task would be to scope out a process to periodically update the characterization of recycled water supply and demands. Following each future assessment, the Recycled Water Projects Committee would determine the need to perform the steps in Tasks 3 through 6 again.

Cooperative Efforts with Appropriate Entities to Implement Activity D

This is a basin-wide activity that involves the Parties in the IEUA, TVMWD, and WMWD service areas. Given its current efforts, the IEUA would be the logical entity to lead the implementation of Activity D on behalf of all Parties in these service areas, but the process could be led by others. In this role, the agency leading the project on behalf of the Parties would: convene the Recycled Water Projects Committee, characterize recycled water demands, identify additional recycled water supplies and conduct discussions with the owners of those supplies, and contract for planning and engineering services as required. Watermaster's role would be to work with project lead, on the implementation of Activity D (1) to review and evaluate the basin management implications of the recycled water projects, including but not limited to compliance with the maximum benefit SNMP and (2) to ensure that its implementation is consistent with the Judgment, Peace Agreements and other agreements, and the Watermaster Rules and Regulations.

Implementation Actions, Schedule, and Costs for Activity D

The recommended schedule to complete the scope of work described herein is described below:

Year one:

- Convene Recycled Water Projects Committee and refine scope of work, schedule and budget (Task 1).
- Characterize the availability of all recycled water supplies (Task 2).
- Develop planning, screening, and evaluation criteria for recycled water projects (Task 3).
- Conduct five committee meetings to review and refine the work products of Tasks 1 through 3.

Year two:

- Develop list of recycled water projects for evaluation (Task 4).
- Begin reconnaissance-level engineering study for the proposed projects (Task 5).
- Conduct four workshops to review and refine work products of Tasks 4 and 5.

Year three:

- Complete reconnaissance-level engineering study for the proposed projects (Task 5).
- Select project(s) for implementation.
- Prepare final report documenting work performed in Tasks 1 through 5.

Years four through six:

- Watermaster, the IEUA, and other potential partners develop a project implementation agreement. The objective of this agreement is to define the roles of each partner in the planning, permitting, design, and implementation of the projects, and the cost allocations.
- Preliminary design of recommended projects. The level of design will be such that it enables the preparation of environmental documentation pursuant to CEQA, provides information for identifying and acquiring construction and related permits, and produces an updated recycled water capacity benefit.

- Prepare environmental documentation for projects. CEQA will cover the recommended projects at the project level and the deferred projects at a programmatic level (PEIR), based on the project descriptions developed in Task 5. This documentation will tier-off from the 2020 OBMP Update PEIR. Watermaster will conduct an MPI analysis in parallel with the CEQA process.

Years seven and eight:

- Prepare final designs and acquire necessary permits for the selected projects.

Years nine and beyond:

- Construct selected Projects.

Exhibit D-7 shows the estimated budget-level engineering cost to complete Tasks 1 through 5, which is about $620,000. The cost of Tasks 6 and 7 cannot be estimated until the completion of Task 5. Exhibit D-7 also shows how Tasks 1 through 5 and their associated costs will be scheduled over the first three years of implementation.

As previously discussed, because the IEUA performs various efforts to estimate the recycled water supply and demands of its member agencies and is currently developing estimates of recycled water availability in the region and developing a list of project concepts for recycled water reuse as part of the CBP, the cost to perform Activity D may be lower than estimated herein.

Activity EF

Description of Activity EF

Activities E and F defined by the stakeholders are both are intended to address impediments to groundwater management that are related to groundwater quality, specifically contaminants of emerging concern. Activity E of the OBMP Update is:

> *Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses.*

Activity F of the OBMP Update is:

> *Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality.*

The objective of the management plan envisioned for Activity E is to collect and analyze the data and information needed to characterize and proactively plan for the water quality challenges to pumping groundwater for municipal supply in a constantly evolving regulatory environment. The objective of Activity F is to evaluate the treatment and related infrastructure improvements, including the potential for multi-benefit collaborative projects, that can be implemented to ensure groundwater can be pumped for beneficial use as new drinking water regulations are adopted by the State Board's Division of Drinking Water (DDW[17]).

Through the listening session process, the stakeholders identified the following as potential outcomes of performing Activities E and F:

- Proactively address challenges and solutions to comply with new and potential future drinking water regulations.
- Enable the Parties to make informed decisions on infrastructure improvements for water-quality management and regulatory compliance.
- Remove groundwater contaminants from the Chino Basin and thereby improve groundwater quality.
- Enable the Parties to produce or leverage their water rights that may be constrained by water quality.
- Ensure that groundwater is pumped and thereby protect/enhance Safe Yield.

The 2000 OBMP included multiple PEs to protect and enhance water quality. PE 6—*Develop and Implement Cooperative Programs with the Regional Board and Other Agencies to Improve Basin Management*—was included to assess water quality trends in the basin, to evaluate the impact of OBMP implementation on water quality, to determine whether point and non-point contamination sources are being addressed by water quality regulators, and to collaborate with water quality regulators to identify and facilitate the cleanup of soil and groundwater contamination. PE 7—*Develop and Implement Salt Management Plan*—was included to characterize current and future salt and nutrient conditions in the basin and to subsequently develop and implement a plan to manage them. PE 3—*Develop and Implement a Water Supply Plan for Impaired Areas*—provided for the construction and operation of regional groundwater desalters, the Chino Basin Desalters (Desalters), to pump and treat high-salinity

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[17] The DDW regulates public drinking water systems in California; prior to June 2014 it was the California Department of Public Health which was formally known as the Department of Health Services. All references to the actions of DDW herein include its predecessors.

groundwater in the southern part of the basin to maintain and enhance Safe Yield and meet increasing municipal water demands. The 2000 OBMP also recognized that the Desalters would intercept VOC contaminants associated with the Chino Airport and South Archibald plumes and that the Desalters could be used in the future to treat these contaminants (at some additional cost).

Since 2000, under PE 6, Watermaster has assessed groundwater quality in the Chino Basin using data compiled through their own monitoring activities and the efforts of other cooperating entities, reported on the water quality trends and findings, and collaborated with the Regional Board in its efforts to work with dischargers to facilitate the cleanup of groundwater contamination. Watermaster formed the Water Quality Committee to coordinate many of these activities. The Water Quality Committee convened from 2003 through 2010 and reported on its findings, work products, and recommendations to the Watermaster Pools, Advisory Committee, and Board. Since 2009, Watermaster has continued to perform ad-hoc monitoring for contaminants of emerging concern at its monitoring wells and some private agricultural wells and prepares annual or more frequent reports on the status of monitoring and remediation of point-source contamination sites. The opportunities to use the Desalters to assist in the remediation of the Chino Airport and South Archibald plumes envisioned in the 2000 OBMP IP are coming to fruition.

The objectives of Activity E and PE 6 are similar in that they address the management of groundwater quality contaminants from point and non-point sources that threaten the use of groundwater for drinking water supply. Activity E is a refinement on PE 6 in that it seeks a more proactive and basin-wide approach to address contaminants of emerging concern to better prepare the Parties for addressing compliance with new and increasingly stringent drinking water regulations defined by the DDW.

The objective of Activity F is similar to PE 3 in that it seeks to evaluate the feasibility of regional solutions for the treatment of impaired areas that can provide multiple benefits in the management of the basin to achieve the goals of the OBMP. The areas and contaminants that need to and can be addressed with regional, multi-benefit solutions can be determined as part of the process to develop and implement the groundwater quality management plan envisioned in Activity E.

The scope of work defined herein for developing and implementing a *Groundwater Quality Management Plan* will address both Activities E and F and, when implemented, will provide information that will enable municipal water agencies to make informed decisions on how to manage groundwater quality for beneficial uses. The scope of the *Groundwater Quality Management Plan* does not address salinity, which is managed separately under Watermaster and IEUA maximum benefit SNMP.

Need and Function of Activity EF

Throughout most of the Chino Basin, there are contaminants in groundwater that can limit its direct use for drinking water supply if treatment is not implemented. Drinking water is regulated by the DDW. The enforceable drinking water standards to protect the public from potential negative health effects are Primary Maximum Contaminant Levels (MCLs) set by the DDW. Water supplies that exceed MCLs cannot be used for drinking water without treatment (blending is the most common treatment). In addition, the DDW sets Notification Levels (NLs), which are health-based advisory levels for potential contaminants of concern that do not have MCLs established. The level at which DDW recommends removal of a drinking water source from service is called the "Response Level," where the Response Level ranges between ten to 100 times the NL, depending on the toxicological endpoint that is the basis for establishing the NL. Since the 1980s, the DDW has established NLs for 93 contaminants, 40 of which now have MCLs.

Since the implementation of the 2000 OBMP, the DDW has adopted new Primary MCLs that have changed or restricted how and where groundwater is pumped by municipal water agencies. As laboratory analytical technologies to detect contaminants in water advance over time, it can be expected that new contaminants of concern will be identified, and some will ultimately become regulated. In response, municipal water agencies will need to construct treatment facilities or implement changes in existing pumping operations to address the newly regulated contaminants. With each new regulation there are increasing constraints on existing water supply infrastructure that can limit a Parties' ability to pump their groundwater rights and stored water and conflict with other basin management issues that include, but are not limited to, groundwater recharge, maintaining Safe Yield, and maintaining Hydraulic Control.

Occurrence of Contaminants in the Chino Basin

Exhibit EF-1 summarizes the occurrence of drinking water contaminants with a Primary MCL in groundwater pumped from active municipal supply wells in the Chino Basin for the five-year period of 2014 to 2018. For this discussion, "active municipal supply wells" includes the 141 municipal supply wells that pumped groundwater anytime within the two-year period of 2017 to 2018. For comparison, this table also summarizes the number of wells with exceedances of the MCL for: all existing municipal supply wells whether they are recently active or not and all existing wells in the basin, including private agricultural, non-agricultural, municipal supply, and monitoring wells, whether they are recently active or not. The three most common contaminants that exceed a primary MCL in the Chino Basin at active municipal supply wells are nitrate (71 wells), 1,2,3-trichloropropane (1,2,3-TCP) (33 wells), and perchlorate (27 wells).

Exhibit EF-2 shows the locations of active municipal supply wells and symbolizes them based on the number of regulated drinking water contaminants that have been detected in exceedance of their respective primary MCLs. Of the 141 recently active municipal supply wells, 45 have at least one drinking water contaminant, 17 wells have two contaminants, 14 have three contaminants, five have four contaminants, and five have five contaminants. The wells with regulated drinking water contaminants are primarily located in the southern (south of the 60 freeway) and western (west of Euclid Avenue) areas of the Basin. Exhibits EF-3, EF-4, and EF-5 show the spatial distribution of the maximum observed nitrate, 1,2,3-TCP, and perchlorate concentrations at all wells in the Chino Basin for the five-year period of 2014 to 2018.

The occurrence of 1,2,3-TCP in nearly 25 percent of active municipal supply wells is noteworthy. The MCL for 1,2,3-TCP is 0.005 micrograms per liter (µgl), which is 5 parts per trillion (ppt). This is the lowest numerical value for a MCL established to date in the State of California. And, unlike past newly adopted MCLs, the MCL for 1,2,3-TCP became immediately effective upon its adoption in December 2017. As a result, municipal water agencies were immediately required to either cease using active wells that pump groundwater with 1,2,3-TCP concentrations in excess of the new MCL or implement treatment (typically blending) to ensure their water supplies have a 1,2,3-TCP concentration below the MCL. Prior to 2018, municipal water supplies were not routinely tested for 1,2,3-TCP even though there was an existing NL for 1,2,3-TCP of 0.005 µgl. And, when testing occurred it was not always done using the lowest available detection limit that was equal to the NL. For this reason, upon adoption of the MCL, the DDW also required municipal water agencies to perform quarterly compliance monitoring in 2018 using laboratory detection limits low enough to test for concentrations equivalent to the MCL of 0.005 µgl. Exhibit EF-4 includes the quarterly monitoring results from 2018 and represents the most comprehensive characterization of the occurrence of 1,2,3-TCP in the Chino Basin to date. The wells producing groundwater with 1,2,3-TCP concentrations equal to or greater than the MCL are primarily located in the western half of the Basin. The following agencies have had to shut down supply wells or modify operations as a result of the new MCL: the City of Chino Hills, CDA, City of Chino, City of Pomona, Monte Vista Water District (MVWD), and JCSD.

Exhibit EF-6 summarizes the occurrence of drinking water contaminants with a California NL in groundwater pumped from active municipal supply wells in the Chino Basin for the five-year period of 2014 to 2018. For comparison, this table also summarizes the number of wells with exceedances of the NLs for: all existing municipal supply wells whether recently active or not and all existing wells in the basin, including private agricultural, non-agricultural, municipal supply, and monitoring wells whether they are recently active or not. Exhibit EF-7 shows the location of the active municipal supply wells and symbolizes them based on the number of contaminants that have been detected in exceedance of a NL. Of the 141 recently active municipal supply wells, only two wells show an exceedance of an NL for one contaminant: groundwater sampled from both wells exceed the NL for 1,4-dioxane. It is likely there are more occurrences of NL exceedances for 1,4- dioxane and other contaminants in the Chino Basin, but because the DDW does not require monitoring for contaminants with an NL and/or testing is not performed using analytical methods with the numerically lowest detection limits that are equal to or lower than the NLs, the potential impact to the Parties posed by the adoption of MCLs based on existing NLs cannot be characterized.

Readiness to Address Future Drinking Water Regulations

Since the implementation of the 2000 OBMP, the DDW has adopted three new Primary MCLs that have impacted municipal water agencies the Chino Basin, including perchlorate, hexavalent chromium, and 1,2,3-TCP. And, as demonstrated by the newest MCL for 1,2,3-TCP, the timeline for complying with new drinking water quality regulations is becoming more restrictive. To prepare for the challenges of complying with potential future MCLs, it will be increasingly important for municipal supply agencies to understand which emerging contaminants of concern are candidates for regulation, potential regulatory limits, and the occurrence of those contaminants in local and regional water supplies. Tracking emerging contaminants that are being considered for regulation and performing monitoring to characterize their occurrence in the Chino Basin will help to identify and plan for optimal solutions to manage groundwater quality for drinking water supply.

Since 2000, under PE 6, Watermaster has assessed groundwater quality in the Chino Basin using data compiled through its own monitoring activities and the efforts of other cooperating entities, and has reported on the water quality trends and findings related to regulated contaminants and contaminants of emerging concern in its biannual State of the Basin reports. For the municipal water agencies, monitoring groundwater for emerging contaminants is, for the most part, a voluntary activity. There are periodic monitoring requirements under the Federal Environmental Protection Agency's (EPA) Unregulated Contaminant Monitoring Rule (UCMR), which is implemented to collect occurrence data for selected contaminants of emerging concern that have documented potential public health effects. Monitoring under the UCMR program is performed every five years and the results are used, in part, to support determinations of whether or not to regulate a contaminant in drinking water to protect public health. For each UCMR cycle, the EPA defines the municipal water agencies that must perform monitoring and the analytical methods and detection limits that should be used for each contaminant on the UCMR list. Generally, the UCMR does not require municipal water agencies to test all of their water supply sources and, as to groundwater, may only require a subset of wells be sampled. And, the UCMR does not always require the use of analytical methods with the numerically lowest detection limits, which in some cases means that analysis is done using detection limits for reporting (DLR) that are above potential regulatory limits, as was the case for UCMR monitoring of 1,2,3-TCP. Once a UCMR monitoring event is over, no additional requirements for testing for the contaminants of emerging concern are required. In the State of California, the monitoring of unregulated contaminants with established NLs is recommended but not required. And as with UCMR monitoring, the use of analytical methods with the numerically lowest detection limits are often not used. Because monitoring for unregulated contaminants is voluntary and there are various analytical methods used, it is generally difficult to characterize the basin-wide occurrence of contaminants of emerging concern.

The occurrence of three contaminants in the Chino Basin that are subject to revised or new drinking water regulations are discussed below.

Perchlorate and Hexavalent Chromium

Currently, in the State of California, there are two drinking water contaminants with primary MCLs that are well characterized in the Chino Basin that are undergoing review and consideration by the DDW for an MCL revision: perchlorate and hexavalent chromium.

Perchlorate. As previously described, perchlorate is one of the top three drinking water contaminants in the Chino Basin. An MCL of 6 µgl was established in 2007. In 2015, the Office of Environmental Health Hazard Assessment (OEHHA) revised the Public Health Goal (PHG[18]) for perchlorate from 6 µgl to 1 µgl, based on new scientific literature that indicates possible health effects to infants from exposure to perchlorate in drinking water. This revision prompted the DDW to review the current MCL and determine if it should be lowered to a value closer to the revised PHG. To support its review and decision, the DDW has recommended that the required DLR for analysis of municipal drinking water supplies be lowered from the current DLR of 4 µgl to equal to or less than 1 µgl and occurrence data be collected across the state.

Exhibit EF-8 shows the spatial distribution of the maximum observed perchlorate concentration for all wells in the Chino Basin for the five-year period of 2014 through 2018 along with the locations of the 141 active municipal supply wells. Exhibit EF-8 differs from Exhibit EF-5 in that the symbology of the perchlorate concentration at wells is based on the PHG of 1 µgl and not the MCL of 6 µgl. Exhibit EF-8 also indicates which of the wells in the basin characterized as having “non-detect” concentrations have not been tested using detection limits that are less than or equal to the PHG of 1 µgl (DLR = 4 µgl). Most of the wells that have not been tested at the lower DLR are private wells south of the 60 freeway. Exhibit EF-8 shows that 95 percent of the of the detectable concentrations of perchlorate in the basin are above the PHG of 1 µgl and that perchlorate is prevalent throughout the entire Chino Basin. As such, compliance with the drinking water standard could require treatment facilities across most of the Chino Basin if the MCL is lowered from 6 µgl.

Hexavalent Chromium. The PHG for hexavalent chromium is 0.02 µgl. In 2014, the DDW established an MCL of 10 µgl, which was subsequently challenged in court. In 2017, the Superior Court of Sacramento County issued a judgment invalidating the Primary MCL for drinking water because the DDW failed to properly consider the economic feasibility of complying with it. The court ordered the DDW to conduct an economic evaluation and establish and adopt a new MCL, which could be the same or different from the prior and now invalidated MCL of 10 µgl. Exhibit EF-9 shows the spatial distribution of the maximum observed hexavalent chromium concentration for all wells in the Chino Basin for the five-year period of 2014 through 2018. The symbology of the observed hexavalent chromium concentrations is based on the prior MCL of 10 µgl. Seven percent of all wells sampled have a concentration above 10 µgl: 127 of the 141 active municipal supply wells have a detectable concentration of hexavalent chromium, and nine of the 141 active municipal wells exceeded 10 µgl. Hexavalent chromium is not a widespread compliance issue

[18] 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, but State of California law requires the DDW to set MCLs for a contaminant as close as technologically and economically possible to the PHG.

based on the old 10 µgl MCL, but compliance could be problematic in the future if the DDW establishes a new MCL less than 10 µgl.

Poly- and Per-fluorinated Compounds. An example of emerging contaminants that were part of the UCMR and are currently receiving notable regulatory attention on both State and Federal levels include two PFAS compounds: — perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). In 2009, the EPA published provisional Health Advisory Levels (HAL) for PFOA and PFOS of 400 nanograms per liter (ngl) and 200 ngl, respectively (or 400 and 200 parts per trillion [ppt]). The 2012 UCMR 3 contaminant monitoring list included six PFAS, including PFOA and PFOS. The required DLRs for PFOA and PFOS were 20 and 40 ngl, respectively. In 2016, following the UCMR 3 monitoring, the EPA significantly lowered the HAL for PFOA and PFOS to a combined 70 ngl, a 90 percent reduction. And, in 2018, the DDW established NLs for PFOA and PFOS of 14 and 13 ngl, respectively. That same year, laboratory methods with detection limits numerically less than these NLs became available. As part of the NL guidelines, the DDW established an interim Response Level of 70 ngl for PFOA and PFOS combined, consistent with the EPA's interim HAL. If the DDW recommends that the water source be removed from service or that treatment be implemented to get levels below the Response Level. The PFOA and PFOS Response Level is five times the NL for one of them individually; this is more stringent than other Response Levels established by the DDW, which as previously noted are typically ten to 100 times the NL.

Exhibit EF-10 shows the occurrence of PFOA and PFOS in groundwater and some blending sources for the recycled water recharge in the Chino Basin as of March 2019, based on all monitoring performed since 1998. The exhibit shows that the majority of wells in the Chino Basin have not been sampled for PFOA and/or PFOS. The 30 wells in the Chino Basin that have been sampled for PFOA and PFOS were tested during UCMR 3 using the laboratory detection limits of 20 and 40 ngl, which are higher than the current NLs. Monitoring of recycled water recharge blending sources shows that many of the sources sampled have detectable concentrations of PFOA and PFOS, and some are above the NLs. The EPA and the DDW have both indicated that they are moving forward with the process to adopt MCLs for PFOA and PFOS in the near future. The occurrence of PFOA and PFOS in Chino Basin groundwater as of March 2019 is not well characterized at concentrations equivalent to or below the current NLs, and there are recharge water sources with concentrations of PFOA and PFOS above the NLs. Widespread monitoring for PFOA and PFOS using lower-detection limit laboratory methods is necessary to understand the occurrence of PFOA and PFOS in the basin in order to plan for compliance with potential new drinking water regulations.

Basin Management and Water Rights Implications of More Stringent Water Quality Regulations

To maintain yield and limit losses to the Santa Ana River, the Chino Basin is managed as hydrologically closed: the primary discharge of groundwater from the Chino Basin is groundwater pumping. Maintaining Hydraulic Control in this way is also a requirement of the maximum benefit SNMP. Operating the Chino Basin as a closed system contributes to the accumulation of salts, nutrients, and other contaminants in groundwater, which are primarily removed by groundwater pumping. The constantly evolving regulatory environment described above threatens the ability of the Parties to pump groundwater, and some Parties are not or will not be able to pump their groundwater rights due to the presence of contaminants and the lack of treatment facilities to comply with drinking water quality standards.

As is currently occurring in response to the immediate enforcement of the new MCL for 1,2,3-TCP, it is likely that the initial response actions for compliance with new MCLs will be to shut-down pumping at wells with concentrations that exceed the MCL until a treatment plan is developed and implemented, which for some agencies could take years. Prolonged reductions in groundwater pumping due to groundwater contamination have the effect of reducing Safe Yield and potentially contributing to the loss of Hydraulic Control and the spread of contamination. Therefore, it will become increasingly necessary to pump and treat groundwater to comply with drinking water standards and maintain Safe Yield and Hydraulic Control of the Chino Basin.

With the exception of the Desalters, groundwater treatment facilities in the Chino Basin have been constructed and operated by individual municipal water supply agencies, and the construction and operations and maintenance costs are borne by the agency alone. There is potential for cost savings and other benefits to basin management, such as protecting Safe Yield, and maintaining Hydraulic Control, if regional groundwater treatment and conveyance systems are implemented to address groundwater contamination.

Summary

In order to achieve the objectives of Activities E and F to effectively plan for compliance with future water quality regulations, a *Groundwater Quality Management Plan* should be developed (1) to continually track the UCMR monitoring program, DDW regulatory activities, and others to stay informed of which groundwater contaminants are potential candidates for future MCLs; (2) to implement a long-term basin-wide monitoring plan—including protocols for the use of consistent laboratory methods by all agencies—to collect data on the occurrence of the contaminants of emerging concern; (3) to periodically characterize the potential for compliance challenges on a basin-wide scale; and (4) to develop and evaluate individual and regional compliance solutions to address these challenges. Such a process will enable the Parties to prioritize the most cost-effective compliance solutions that provide for multiple benefits in achieving the goals of the OBMP. The *Groundwater Quality Management Plan* could be developed and implemented by reconvening the Water Quality Committee. The scope of work to develop the *Groundwater Quality Management Plan* is described below.

Scope of Work for Activity EF

The scope of work to develop and implement a *Groundwater Quality Management Plan* consistent with the objectives of Activity EF consists of eight tasks.

- Task 1 – Convene the Water Quality Committee, define objectives, and refine scope of work
- Task 2 – Develop and implement an initial emerging-contaminants monitoring plan
- Task 3 – Perform a water quality assessment and prepare a scope to develop and implement a Groundwater Quality Management Plan
- Task 4 – Develop planning, screening, and evaluation criteria
- Task 5 – Identify and describe potential projects for evaluation
- Task 6 – Conduct a reconnaissance-level study for the proposed projects
- Task 7 – Prepare the *Groundwater Quality Management Plan*
- Task 8 – Plan, design, and build water quality management projects

Task 1 will develop the administrative and stakeholder process and refine the objectives and scope for developing the *Groundwater Quality Management Plan*. Tasks 2 and 3 will include an initial monitoring program and the characterization of current water quality conditions to determine the appropriate long-term monitoring and assessment program and to support the development and implementation of the groundwater quality management plan. Tasks 4 through 8 contain the efforts to fully develop and implement a groundwater quality management plan. The precise scope and level of effort required to perform Tasks 4 through 8 will greatly depend on the assessment in Task 3. At present, there is not enough information to fully scope out these later tasks. The activities for Tasks 4 through 8 are generally described below, but the cost estimate to perform these tasks is not estimated herein. For completeness, a scoping effort to perform Tasks 4 through 7 will be included as a work-product of Task 3. The scoping effort for Task 8 cannot be completed until Task 7 is completed.

Task 1 – Convene the Water Quality Committee, define objectives, and refine scope of work. The objective of this task is to reestablish the Water Quality Committee, which will be comprised of representatives from all interested stakeholders for the purposes of developing and implementing a groundwater quality management plan. The Committee will precisely articulate the objectives of a groundwater quality management plan and refine the scope of work described below in Tasks 2 and 3 to develop and implement an initial monitoring plan, to perform an assessment of the current water quality condition, and to scope the remaining tasks to develop a groundwater quality management plan. After the scope of work has been refined, the cost and implementation schedule will be updated. Four Committee meetings will be conducted to obtain consensus on the objectives and scope of work.

Task 2 – Develop and implement an initial emerging-contaminants monitoring plan. The objective of this task is to develop a monitoring plan to support the initial assessment of water quality conditions related to contaminants of emerging concern in the Chino Basin. The intent is to conduct monitoring using consistent laboratory methods and detection limits at all wells (including those sampled by Watermaster and municipal water agencies) and to use methods with detection limits that are capable of quantifying concentrations at levels equal to relevant regulatory criteria such as PHGs, NLs, or MCLs.

The initial emerging contaminants monitoring plan will include: a list of wells to be sampled, the list of contaminants to analyze, and a quality assurance project plan (QAPP) that defines the monitoring procedures, quality assurance and quality control (QAQC) protocols for data collection and review, and other requirements. The list of wells will include all municipal supply wells and all monitoring and private wells that are in the capture zone of the municipal supply wells. The QAPP will ensure that Watermaster and each municipal water agency that tests its own wells will collect and analyze samples in a consistent manner. The monitoring plan may include the collection and analysis of groundwater in adjacent groundwater basins that are tributary to the Chino Basin and other sources of recharge to the groundwater basin. At a minimum, the initial emerging contaminants monitoring plan should consist of a one-time sampling event at each well identified in the plan. Two Committee meetings will be conducted to obtain consensus on the scope, cost, and schedule to perform the initial monitoring.

Once consensus is achieved, the initial emerging contaminants monitoring plan will be executed by Watermaster and all participating agencies at the selected wells. The labor and laboratory costs to conduct the initial monitoring at municipal wells will be incurred by the well owners. The labor and laboratory cost to conduct the initial monitoring at monitoring wells or private wells in the capture zone of municipal supply wells will be incurred by Watermaster.[19] All monitoring data will be collected, processed, reviewed for QA/QC, and uploaded to a centralized database maintained by Watermaster for the Chino Basin. The Committee will use the data collected for the initial emerging contaminants monitoring plan, along with other groundwater quality data collected and maintained by Watermaster for the basin-wide groundwater quality monitoring program, to perform the initial water quality assessment in Task 3.

Task 3 – Perform a water quality assessment and prepare a scope to develop and implement a Groundwater Quality Management Plan. The objectives of this task are to prepare a comprehensive assessment of current water quality conditions related to contaminants of emerging concern in the Chino Basin and perform a scoping effort to develop and implement a groundwater quality management plan. Task 3 will begin once the initial emerging contaminants monitoring plan developed in Task 2 has been completed.

The water quality assessment will characterize:

[19] This scope of work assumes 40 monitoring and private wells will be sampled by Watermaster.

- basin-wide concentrations of constituents analyzed pursuant to the initial emerging contaminants monitoring plan;
- current and foreseeable challenges to pumping groundwater for municipal supply based on the results of initial monitoring and other data;
- actions currently being implemented by the Parties to mitigate and/or adapt to current or foreseeable water quality challenges; and
- areas where there are no actions being implemented or planned to mitigate and/or adapt to current or foreseeable water quality challenges.

The water quality assessment will support the scoping effort (1) to implement a long-term monitoring and assessment program and (2) to complete the *Groundwater Quality Management Plan* (e.g. perform Tasks 4 through 7 to identify, evaluate, and select projects to address groundwater quality).

The long-term monitoring and assessment program should be adaptive and include a process to update it at a selected frequency and/or when triggered, based on the needs of the Water Quality Committee, observed trends in water quality, or new or potential regulations.

The deliverable of this task will be a technical report that documents the initial monitoring program, the basin-wide characterization of water quality, the recommended scope of work, schedule and cost to implement a long-term monitoring and assessment program, and the scope of work, schedule, and cost to complete the groundwater quality management plan (Tasks 4 through 7). Four Committee meetings will be conducted to complete the work necessary for Task 3.

Task 4 – Develop planning, screening, and evaluation criteria. The objectives of this task are to develop criteria to evaluate water quality improvement projects. The types of criteria developed to evaluate potential projects in Task 4 will include:

- Watermaster criteria that include no potential MPI, balance of recharge and discharge, and others;
- regulatory criteria that include compliance with DDW regulations and others;
- qualitative criteria that include institutional complexity, overall water supply reliability, and others; and
- quantitative criteria that include business case evaluations expressed as net present value, unit cost, and others.

Task 5 – Identify and describe potential projects for evaluation. The objectives of this task are to identify groundwater quality treatment projects using existing and new facilities, to screen them using the criteria developed in Task 4, and to select a final list of projects for detailed evaluation in Task 6. The list of potential projects should include concepts using existing infrastructure and new infrastructure, solutions for individual agencies, and collaborative solutions.

Task 6 – Conduct a reconnaissance-level study for the proposed projects. The objective of this task is to characterize the performance and the groundwater treatment projects selected for evaluation in Task 5, individually and as a group/system. A reconnaissance-level engineering design and operating plan will be developed for each project. Each project design will include the approximate location, target contaminants, treated volumes, and conveyance systems, and will describe any potential implementation barriers. A cost opinion will be determined for each project. The cost opinion will include a comparison of the cost to implement treatment projects by individual municipal agencies to those of collaborative projects. This task will include a recommended set of projects for implementation, based on the criteria developed under Task 4. The final deliverable of this task will be an implementation plan that includes a schedule and plan to finance preliminary design and CEQA documentation of the projects selected for implementation.

Task 7 – Prepare the Groundwater Quality Management Plan. The objective of this task is to prepare the *Groundwater Quality Management Plan*, which will document the most current water quality assessment, the long-term monitoring and analysis plan, the reconnaissance-level engineering design plan, the selected projects for implementation, and an implementation plan. New regulatory requirements and the compliance challenges that result can occur at random, so the groundwater quality management plan should include a strategy to trigger an update to address pending or newly adopted regulations. Water quality results reported out of the long-term monitoring and assessment program could also trigger the need to update the management plan. The implementation plan will include a process to initiate the development and implementation of an update to the *Groundwater Quality Management Plan*.

Task 8 – Plan, design, and build water quality management projects. The objective of this task is to implement the recommended projects in the *Groundwater Quality Management Plan*. This task includes (1) developing and implementing necessary agreements between participating Parties, (2) preparing preliminary designs of the recommended projects, (3) preparing the environmental documentation for the recommended projects (this will tier-off from the 2020 OBMP Update PEIR), (4) preparing financial plans to construct the recommended projects, (5) preparing final designs of the recommended projects, (6) acquiring necessary permits for constructing and operating the recommended projects, and (7) constructing the recommended projects.

Cooperative Efforts with Appropriate Entities to Implement Activity EF

Watermaster and the IEUA will collaborate to support the development of the *Groundwater Quality Management Plan*. Based on the scope of work described above, the following is a description of the recommended roles of each agency:

- ***Watermaster.*** Convenes the Water Quality Committee, leads the stakeholder process to define the initial emerging contaminants monitoring plan, performs monitoring at Watermaster monitoring wells and private wells pursuant to the initial and long-term monitoring plans, collects and maintains the data collected by the municipal agencies and other stakeholders as part of the initial and long-term monitoring plans, performs water quality assessments of the Chino Basin, and prepares the final groundwater quality management plan.
- ***IEUA.*** Leads stakeholders in the process of identifying and describing potential projects, conducting a reconnaissance-level engineering study for the proposed projects, and project implementation.

Implementation Actions, Schedule, and Costs for Activity EF

The recommended schedule to complete the scope of work described herein is described below:

Year one:

- Convene the Water Quality Committee, define objectives, and refine scope of work for Tasks 2 and 3 (Task 1).
- Develop initial emerging contaminants monitoring plan (Task 2).

Year two:

- Implement initial emerging contaminants monitoring plan (Task 2).
- Begin preparing the water quality assessment of the Chino Basin (Task 3).

Year three:

- Complete the water quality assessment of the Chino Basin, recommendations for a long-term monitoring and assessment program, and the scoping effort for Tasks 4 through 7 (Task 3).

Year four:

- Implement long-term monitoring and assessment program (continues every year thereafter, subject to periodic modifications).
- Develop planning, screening, and evaluation criteria to review potential projects (Task 4).
- Identify and describe potential projects for evaluation (Task 5).
- Begin the reconnaissance-level study of selected projects (Task 6).

Year five:

- Complete the reconnaissance-level study of selected projects (Task 6).
- Select project/s for implementation (Task 6).
- Begin to prepare the *Groundwater Quality Management Plan* (Task 7).
- Conduct the long-term monitoring and assessment plan as defined in Task 3.

Years six and seven:

- Complete the final *Groundwater Quality Management Plan* (Task 7).
- Prepare necessary agreements to implement selected projects.
- Prepare preliminary design reports for the recommended projects. The level of design will be such that it enables the preparation of environmental documentation pursuant to CEQA, provides information for identifying and acquiring construction and related permits, and produces updated cost estimates (Task 8).
- Conduct the long-term monitoring and assessment plan as defined in Task 3.

Years eight to ten:

- Prepare final designs and acquire necessary permits for the selected projects (Task 8).
- Construct selected projects.
- Conduct the long-term monitoring and assessment plan as defined in Task 3.

Exhibit EF-11 shows the estimated budget-level engineering cost to complete Tasks 1 through 3, which is about $295,000. The cost of Tasks 4 through 7 cannot be estimated until the completion of Task 3, and the cost of Task 8 cannot be estimated until the completion of Task 7. Exhibit EF-11 also shows how Tasks 1 through 3 and their associated costs will be scheduled over the first three years of implementation.

Activity CG

Description of Activity CG

Activities C and G, defined by the stakeholders, are both intended to address the need for infrastructure to optimize the use of water supplies. Activity C defined by the stakeholders is:

> *Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence.*

Activity G defined by the stakeholders is:

> *Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure.*

The two activities were combined into Activity CG.

The Parties have identified that there are basin management challenges, such as land subsidence and poor water quality, that could limit the ability to fully exercise their pumping rights using existing infrastructure. The intent of Activity CG is to optimize the use of all sources of water available to the Parties to meet their demands despite these basin management challenges and potentially help to mitigate them.

Through the listening session process, the stakeholders identified the following as potential outcomes of performing Activity CG:

- Enable producers with infrastructure in MZ1 and MZ2 to obtain water through regional conveyance, which supports the management of groundwater levels to reduce the potential for land subsidence and ground fissuring.
- Enable the Parties to increase pumping in areas currently constrained by poor water quality.
- Remove groundwater contaminants from the Chino Basin and thereby improve water quality.
- Protect and/or enhance Safe Yield.
- Maximize the use of existing infrastructure, which will minimize investments in new facilities.
- Provide infrastructure that can also be used to implement Storage and Recovery Programs.

Activity CG has similar objectives to those of PE 5 of the 2000 OBMP – *Develop and Implement Regional Supplemental Water Program*. Recognizing that growth in the Chino Basin was going to result in a more than 30 percent increase in then-current water demands, PE 5 was included in the 2000 OBMP to improve regional conveyance and the availability of imported and recycled waters throughout the basin. The implementation plan for PE 5 was combined with PE 3 – *Develop and Implement Water Supply Plan for the Impaired Areas of the Basin* in the OBMP and Peace Agreement.

Early in the development of the PE 3/5 implementation plan, the stakeholders discussed the development of a regional water facilities plan that, when implemented, would enable the Parties to maximize the use of imported water in years when Metropolitan has surplus water and to be able to rely completely on local supplies during years when Metropolitan supplies are low or completely interrupted due to planned or catastrophic outages. This plan involved the construction of new wells and groundwater treatment and regional conveyance improvements; the water produced in this plan would be used exclusively by the Parties. The stakeholders ultimately did not include this plan in the 2000 OBMP IP, preferring at that time to focus on expanding groundwater desalting in the lower Chino Basin, increasing stormwater recharge, and implementing a large-scale recycled water program to maximize its reuse.

The IEUA and its member agencies are currently preparing the *2020 Integrated Water Resources Plan* (IRP), which will serve as a regional implementation strategy for long-term water resources management within IEUA's service area. The objective of the IRP is to ensure that the IEUA's water supplies over the next 25 years are reliable, cost-effective, and environmentally responsible. The 2020 IRP is in development, and there is a significant body of engineering planning being performed that can be leveraged to accomplish the objectives of Activity CG for all Chino Basin Parties.

Need and Function of Activity CG

In addition to Chino Basin groundwater, the sources of water available to the Parties include:

- Imported water purchased from Metropolitan (through the IEUA and TVMWD) and the San Bernardino Valley Municipal Water District (Valley District).
- Non-Chino Basin groundwater from adjacent groundwater basins, including the Six, Spadra, Cucamonga, Rialto, Lytle, and Riverside Basins.
- Local surface water from San Antonio, Cucamonga, Day, Etiwanda, East Canyon, and Lytle Creeks, and some tunnels and springs located in the San Gabriel Mountains.
- Recycled water from the IEUA and the Los Angeles Sanitation District.

Watermaster periodically compiles the Parties' future water supply plans. The data collected as part of that process represent the Parties' best estimates of their demands and associated water supply plans. The most recent effort by Watermaster to characterize the water supply plans was during the development of the *Storage Framework Investigation.*[20,21] Exhibit CG-1 shows the historical (2015) and projected aggregate water demand and supply plan for all Parties. Total water demand is projected to grow from about 290,000 afy in 2015 to about 420,000 afy by 2040, and increase of about 130,000 afy. The projected growth in water demand by the Appropriative Pool Parties drives the increase in aggregate water demand as some Appropriative Pool Parties are projected to serve new urban water demands created by the conversion of agricultural and vacant land uses to urban uses. Chino Basin groundwater and imported water together make up about 70 percent of the aggregate water supplies of the Parties.

Each of the water sources shown in Exhibit CG-1 has its limitations; they are described below.

Chino Basin groundwater and basin management issues

Chino Basin groundwater is the largest source of supply used to meet the demands of the Watermaster Parties. Exhibit CG-1 shows that Chino Basin groundwater makes up about 40 to 50 percent of the total aggregate supply. Groundwater pumping was about 147,000 afy in 2015 and is projected to increase to about 177,000 afy by 2040, an increase of about 30,000 afy. The ability to produce groundwater from the Chino Basin is limited by current basin management issues, such as ongoing land subsidence in MZ1 and parts of MZ2, pumping sustainability issues in the JCSD and CDA well field areas, and water quality.

Land subsidence. One of the earliest indications of land subsidence in the Chino Basin was the appearance of ground fissures within the City of Chino in MZ1. These fissures appeared as early as 1973, but an accelerated occurrence of ground fissuring ensued after 1991 and resulted in damage to existing infrastructure. The OBMP IP called for a management plan to reduce or abate the subsidence and fissuring problems to the extent that it may be caused by pumping in MZ1. Watermaster has been conducting land

[20] The water demand and supply plans developed in 2017 were based in part on 2015 Urban Water Management Plans and updated to 2017 conditions. The Storage Framework Investigation can be found on Watermaster's website. This document is available on Watermaster's FTP site at http://www.cbwm.org/

[21] Watermaster is currently compiling future water supply plans for the Safe Yield Recalculation.

subsidence investigations in the Chino Basin since September 2000 to implement PE 4 of the OBMP IP.[22] The results of the investigations have indicated that the potential occurrence of pumping-induced land subsidence and ground fissuring is confined to MZ1 and MZ2. Watermaster has defined five specific Areas of Subsidence Concern within MZ1 and MZ2: the Managed Area, Northwest MZ1, Central MZ1, the Northeast Area, and the Southeast Area. Exhibit CG-2 shows the locations of the Areas of Subsidence Concern and recent measurements of land subsidence from 2011 to 2019.

For the Managed Area, Watermaster utilized the results of the land subsidence investigations to develop and implement a Subsidence Management Plan (SMP)[23] to minimize the potential for future subsidence and ground fissuring. The SMP established a specific groundwater level at a monitoring well in the Managed Area (the "Guidance Level" at well PA-7 at the Ayala Park Extensometer facility) and recommended that the pumpers with wells in the Managed Area manage their groundwater production such that the groundwater levels at PA-7 remain above the Guidance Level. The main pumpers in the Managed Area are the City of Chino Hills, City of Chino, and State of California. They have voluntarily managed their pumping as recommended in the SMP, and as a result, the rate of land subsidence has declined to de minimis levels within the Managed Area.

Exhibit CG-2 shows that the maximum rate of recent land subsidence from 2011-2019 has occurred in Northwest MZ1. Of particular concern is that the subsidence in Northwest MZ1 has occurred in a pattern of concentrated differential subsidence across the San Jose Fault—the same pattern of differential subsidence that occurred in the Managed Area during the time of ground fissuring in the 1990s. Ground fissuring is the main subsidence-related threat to infrastructure. Exhibit CG-2 also shows the occurrence of subsidence across broad areas in Central MZ1 and the Northeast Area during 2011-2019. Watermaster is monitoring and investigating the relationships between pumping, recharge, groundwater levels and land subsidence in Northwest MZ1, and investigating pumping and recharge strategies to minimize or abate the occurrence of the differential land subsidence. These efforts are being implemented pursuant to the *Work Plan to Develop a Subsidence-Management Plan for the Northwest MZ-1 Area*,[24] which is an appendix to the SMP.

The main groundwater producers in Northwest MZ1, Central MZ1, and the Northeast Area are the City of Pomona, the MVWD, Golden State Water Company (GSWC), the City of Chino, and the City of Ontario. Interim work performed in Northwest MZ1 to support the development of a subsidence management plan for this area suggests that land subsidence could be reduced or abated if recharge in Northwest MZ1 is increased by at least 20,000 afy, pumping is decreased by at least 20,000 afy, or some combination of both totaling about 20,000 afy.[25] Exhibit CG-3 is a time-series chart of groundwater pumping, wet-water recharge, and land subsidence (represented as negative vertical ground motion) in Northwest MZ1 from

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[2] Detailed information on Watermaster's land subsidence investigations, the causes of subsidence and ground fissuring, Watermaster's subsidence management plan for the so-called "Managed Area" in the City of Chino, annual monitoring reports, and ongoing investigations to develop a subsidence management plan for Northwest MZ1 can be found on Watermaster's website at: http://www.cbwm.org/

[23] Chino Basin Watermaster. 2015. *Chino Basin Subsidence Management Plan*. July 2015. This document is available on Watermaster's FTP site at http://www.cbwm.org/

[24] Chino Basin Watermaster. 2015. *Work Plan to Develop a Subsidence Management Plan for the Northwest MZ-1 Area*. This document is available on Watermaster's FTP site at http://www.cbwm.org/

[25] Chino Basin Watermaster. 2017. *Task 3 and Task 4 of the Work Plan to Develop a Subsidence Management Plan for the Northwest MZ-1 Area: Development and Evaluation of Baseline and Initial Subsidence-Management Alternatives*.

1978-2019. Recent pumping in Northwest MZ1 has decreased significantly: 2017-2019 pumping averaged about 12,000 afy compared to about 19,000 afy since the implementation of the OBMP (2001-2016), a reduction of about 7,000 afy. The reduced pumping is mainly due to water quality issues. Additionally, recent wet-water recharge in Northwest MZ1 has increased: 2017-2019 recharge averaged about 15,000 afy compared to about 9,000 afy since the implementation of the OBMP (2001-2016), an increase of about 6,000 afy. Exhibit CG-3 shows that these recent decreases in pumping and increases in recharge, totaling about 13,000 afy, appear to coincide with reduced rates of land subsidence in Northwest MZ1. This suggests that reduced pumping and/or increased recharge can abate land subsidence in Northwest MZ1. If the subsidence management plan for the Northwest MZ1 area recommends a combination of reduced pumping and wet-water recharge to minimize and abate the ongoing land subsidence, the pumpers in this area who elect to reduce pumping in accordance with the plan may have difficulty in fully utilizing their water rights with existing infrastructure.

Pursuant to the Peace Agreement, new land subsidence is considered MPI and would require mitigation. New land subsidence refers to additional land subsidence caused by the reduction of pressure head in the coarse-grain sediments to levels lower than historical lows. Through the Watermaster's recent *Storage Framework Investigation*, a groundwater-elevation metric was defined as a minimum threshold for the occurrence of new land subsidence in MZ1.[26] Based on the modeling results of the *Storage Framework Investigation*, new land subsidence is not projected to occur through 2050 in MZ1 under Scenario 1A, which is based on the Parties' best estimates of how future supplies would be used to meet demands. However, the investigation is limited to new land subsidence and does not address ongoing land subsidence in Northwest MZ1.

Pumping sustainability. The term *pumping sustainability*, as used herein, refers specifically to the ability to pump water from a specific well at a desired pumping rate, given the groundwater level at that well and its specific well construction and equipment details. The pumping sustainability metrics for all Appropriator wells were recently updated as part of the *Storage Framework Investigation*. Groundwater pumping at a well is presumed to be sustainable if the groundwater level at that well is greater than the sustainability metric. If the groundwater level falls below the sustainability metric, the owner will either need to lower the pumping equipment in their well or reduce the well's pumping rate. Groundwater levels at wells in the JCSD and CDA well fields and a part of the FWC service area are currently below the pumping sustainability metric and therefore have limited pumping capacity. Exhibit CG-4 shows the projected difference between the groundwater levels and the pumping sustainability metric in FY 2030 for Scenario 1A. Groundwater levels in Scenario 1A are projected to be above the pumping sustainability metric in 2030 over the entire basin except for the areas with existing pumping sustainability issues, identified by the red circles in Exhibit CG-4. This suggests that projected basin operations will not improve nor exacerbate pumping sustainability issues that currently exist in these areas and that the JCSD and CDA well fields and one well in the FWC service area will continue to have limitations on pumping due to groundwater levels.

Water quality. As described for Activity EF, throughout most of the Chino Basin, there are contaminants in groundwater that can limit its direct use for drinking water supply in the absence of treatment. The constantly evolving regulatory environment described under Activity EF, threatens the ability of the

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[26] The metric is based on historical groundwater levels and is represented as a groundwater level control surface throughout MZ1 that defines the likelihood of initiating new subsidence: if groundwater levels are higher than the metric, then new land subsidence would not occur; if groundwater levels fall below the metric, then new land subsidence could occur and cause MPI.

Parties to pump groundwater. Some Parties are not, or will not be, able to pump their groundwater rights due to the presence of contaminants and the lack of treatment facilities to comply with drinking water standards. For example, the regulatory-required response action for compliance with the new MCL for 1,2,3-TCP is to shut-down pumping at wells with concentrations that exceed the MCL until a treatment plan is implemented.

Exhibit EF-2 shows the locations of active municipal supply wells, symbolized by the number of regulated drinking water contaminants that have been detected in exceedance of their respective primary MCLs. A subset of these wells is currently offline due to these exceedances. According to the interim results from Based on the 2020 IRP, the Parties in the IEUA service area that are impacted by water quality such that some of their production capacity is offline or requires blending are the Cities of Chino, Chino Hills, Upland, and Ontario; the CVWD; the MWVD; and Fontana Water Company. Based on Exhibit EF-2, other Parties that are impacted by water quality and have wells with one or more constituents that exceed an MCL are the City of Pomona, GSWC, JCSD, and Marygold Mutual Water Company. As new drinking water regulations come into effect, additional wells and/or Parties will be impacted if there is no plan to address the contaminants.

Imported water.

Imported water is projected to account for about 20 to 30 percent of the aggregate water supplies of the Parties, as shown in Exhibit CG-1. Imported water demand was about 63,000 afy in 2015 and is projected to increase to about 120,000 afy by 2040, an increase of about 58,000 af. The challenges to imported water include reliability of its supply and infrastructure and the local capacity to treat it for municipal supply.

Supply reliability. In January 2016, Metropolitan completed its *2015 Integrated Resources Plan Update* (2015 IRP)[27], which reported that, if the plan is fully implemented, shortages of imported water supplies will occur about nine percent of the time under 2020 conditions, four percent of the time under 2025 conditions, and zero percent under 2030 conditions. "Shortage" is defined herein as Metropolitan's inability to fully meet its demands. If Metropolitan does not fully implement its 2015 IRP, shortages in Metropolitan supplies are projected to occur about 12 percent of the time under 2020 conditions, and the occurrence of a shortage is projected to increase to 80 percent under 2040 conditions. Therefore, by 2040, Metropolitan is assumed to be able to fully meet its demands 90 percent of the time (nine out of ten years) with the full implementation of its 2015 IRP and 20 percent of the time (one out five years) without it. As of this writing, the implementation of some projects identified in the 2015 IRP, such as the California WaterFix tunnel project, are uncertain. Failure to fully implement the 2015 IRP in a timely manner will result in less imported water available to the Parties.

Infrastructure reliability. Metropolitan is planning to rehabilitate the Rialto Feeder pipeline, and according to its draft schedule, construction will occur from 2029 to 2033. During construction, continuous six- to nine-month shutdowns are planned to occur. Because the Rialto Feeder pipeline is the main source of imported water deliveries to the IEUA and TVMWD, long-term shutdowns will cause significant reductions in water supplies to the Parties and will require them to rely more heavily on Chino Basin groundwater or other supplies during this period.

In addition to planned infrastructure shutdowns, catastrophic events, such as earthquakes, can cause unplanned outages. Metropolitan recently published its three primary goals to contribute to seismic

[27] Metropolitan. (2016). *Integrated Water Resources Plan: 2015 Update*. January 2016.

resilience: (1) conducting a Rialto Feeder pipeline alternative supply needs study, (2) completing a re-evaluation of its emergency storage needs, and (3) completing a comprehensive evaluation of its storage programs.[28] According to Metropolitan, the latest projections for the worst case scenario under a seismic catastrophic event suggest that the Metropolitan's East Branch of the SWP, which includes the Rialto Feeder pipeline, can be repaired within 12 to 24 months. This means, that under such an event, the Parties would be required to find alternative sources of water to meet 20 to 30 percent of their total demands for up to two consecutive years.

Capacity limitations. The capacity to treat imported water to meet future municipal supply demands is limited for some Parties in the Chino Basin. The Water Facilities Authority (WFA) treats imported water purchased from the IEUA at the Agua de Lejos treatment plant (WFA plant) and delivers it to the Cities of Chino, Chino Hills, Ontario, and Upland, and the MVWD. Each of these WFA member agencies has a contracted share of the plant's total capacity of 81 million gallons per day (mgd), which is equivalent to 90,700 afy. The WFA plant's current capacity is less than its rated capacity of 81 mgd due to solids handling limitations.[29] According to the WFA, the current capacity of the WFA plant is about 40 mgd in the summer months and about 20 mgd in the winter months. This suggests that even when imported water is available to the WFA, there is a limitation in the ability to treat the water and deliver it for municipal use.

Other supply reliability issues

Other reliability issues that can affect the Parties include:

- Non-Chino-Basin groundwater supplies. Non-Chino-Basin groundwater is projected to account for 16 to 18 percent of the Parties' aggregate water supplies. This source of water is not available to all the Parties. The reliability of non-Chino-Basin groundwater depends on water quality, water rights, and infrastructure to convey it to a Parties' water systems.
- Local surface water supplies. Local surface water is projected to account for 3 to 5 percent of the aggregate water supplies of the Parties. This water source is not available to all Parties. The reliability of local surface water depends on the hydrologic characteristics of the individual supplies, water quality, water rights, and infrastructure to convey it from points of diversion to a Party's water system.
- Recycled water supply. Recycled water is projected to account for about 7 to 8 percent of the aggregate water supplies of the Parties. The challenges to maximizing the reuse of recycled water are described under Activity D and include: timing of recycled water availability, salt and nutrient management, water quality regulations, and the Santa Ana River Judgment.
- Climate change. Climate change is likely to result in higher temperatures, longer dry periods, and shorter more intense wet periods, which can ultimately affect the availability and management of all water supply sources. For example, shorter more intense precipitation periods are expected to result in reduced recharge, and longer dry periods are expected to result in reduced imported water supplies (as occurred with SWP supplies in the recent drought from 2013 to 2016).

Summary

The water demands of the Chino Basin Parties are expected to increase by 44 percent by 2040, and as illustrated above, there are numerous challenges to the reliability of the supplies and the infrastructure that deliver them. Many of the challenges are interrelated and compounding. And, the impacts to individual Parties and associated costs to manage them are not equal. For example, the reliability of

[28] Metropolitan. (2018). *Seismic Resilience, First Biennial Report*. February 2018.
[29] Email from Terry Catlin, April 10, 2018.

imported water (and other non-groundwater supplies) not only affects the imported water supply but also the groundwater supplies that are dependent on imported water for blending. According to draft results from IEUA's 2020 IRP, the Parties that require blending are: the MVWD, CVWD, FWC, and the Cities of Pomona, Upland, Chino, Chino Hills, Ontario.

In the Chino Basin, prolonged reductions in groundwater pumping due to land subsidence, groundwater sustainability, or groundwater contamination have the effect of reducing Safe Yield, potentially contributing to the loss of Hydraulic Control and the spread of contamination. The ability to convey water from areas that are not subject to these limitations to areas that may provide flexibility to the Parties to pump their respective Chino Basin groundwater rights.

Activity CG will require a planning process that will ensure that the recommended infrastructure that results from it will meet the Parties' needs. To do this, the planning process should answer the following questions:

1) How do the Parties define reliability? How can this be quantified?
2) What is the desired level of reliability? How is it articulated at the regional and individual Party levels? For example, the level of reliability could be articulated as: the ability to meet all or a percentage of the potable water demands of the Parties under a full interruption of SWP supplies delivered by Metropolitan.
3) What are the other benefits of optimization desired by the Parties? How can such benefits be quantified?
4) What existing/planned infrastructure could be used to optimize the use of all sources of water and how would it be used?
5) What new infrastructure would be required to achieve the desired level of reliability and other benefits?
6) How would the existing/planned/new infrastructure be operated to achieve the desired level of reliability and other benefits?
7) Are the capital and O&M costs of optimization less than the cost to agencies to manage the supply and infrastructure challenges on their own?
8) What institutional arrangements are necessary to operate the facilities to achieve the benefits?

As previously mentioned, the IEUA is currently developing the 2020 IRP, which will serve as a regional implementation strategy for long-term water resources management within IEUA's service area. As part of this work, the IEUA retained INTERA to model the existing major infrastructure of the IEUA's service area and develop scenarios to identify opportunities and vulnerabilities in the existing infrastructure of its member agencies. The IRP is in development, and there is a significant body of work being performed by the IEUA and its member agencies that can be leveraged to accomplish the objectives of Activity CG for all of the Parties. The IEUA is also currently conducting preliminary engineering and planning for the CBP, which is a large Storage and Recovery Program to provide regional, dry-year water supplies and associated infrastructure. The project concepts envisioned in the CBP could meet, at least in part, the objectives of Activity CG. Regardless, the work currently in development can be leveraged to reduce the cost of implementing Activity CG.

In order to optimize the use of all sources of water and identify and implement water supply reliability projects, the Parties should convene a Water Supply Reliability Committee for the purposes of accomplishing the objectives of Activity CG for all Parties. The scope of work is described below.

Scope of Work for Activity CG

The scope of work to develop and implement Activity CG consists of six tasks.

- Task 1 – Form the Water Supply Reliability Committee, define objectives, and refine scope
- Task 2 – Characterize water demands, water supply plans, and existing/planned infrastructure and its limitations
- Task 3 – Develop planning, screening, and evaluation criteria
- Task 4 – Describe water supply reliability opportunities
- Task 5 – Develop reconnaissance-level engineering design and operating plan
- Task 6 – Plan, design, build water reliability alternatives

The tasks are described below.

Task 1 – Form the Water Supply Reliability Committee, define objectives, and refine scope. In this task, a Water Supply Reliability Committee will be convened. The Committee's initial tasks are: (1) to clearly articulate and obtain consensus on the objectives for optimizing the use of all sources of water; (2) to define reliability, benefits, and performance criteria for the Parties; and (3) to refine the preliminary scope of work, schedule, and cost defined for Tasks 2 through 6 to fully leverage the existing data and planning efforts of Watermaster, the IEUA, and others. Four Committee meetings will be conducted to accomplish these tasks. In step (2), the Committee will address the following questions:

1) How do the Parties define reliability? How can this be quantified?
2) What is the desired level of reliability? How is it articulated at the regional and the individual Party levels?
3) What are the other benefits of optimization desired by the Parties? How can such benefits be quantified?

Task 2 – Characterize water demands, water supply plans, and existing/planned infrastructure and their limitations. The objectives of this task are: (1) to characterize the water demands and supply plans of the Parties; (2) to characterize existing/planned infrastructure to convey, treat, and distribute the supplies to meet demands; and (3) to identify opportunities and limitations in the existing/planned infrastructure consistent with the objectives of Activity CG defined in Task 1. The water demands and supply plans will be characterized on a monthly basis for various climate conditions. One committee meeting and one individual meeting with each participating Party will be conducted to review the characterization of water demands and supply plans and existing/planned infrastructure. Two additional meetings will be conducted to identify opportunities and limitations in the existing/planned infrastructure consistent with the objectives of Activity CG defined in Task 1.

Task 3 – Develop planning, screening, and evaluation criteria. The objective of this task is to develop the criteria that will be used to evaluate water reliability projects in Tasks 4 and 5. Criteria to evaluate potential projects will include:

- Watermaster criteria that include no potential MPI, balance of recharge and discharge, and others;
- qualitative criteria that include institutional complexity and others; and
- quantitative criteria that include business case evaluations, expressed as net present value, unit cost, and others.

Task 4 – Describe water supply reliability opportunities. The objectives of this task include identifying potential water supply reliability project alternatives, screening them using the screening criteria developed in Task 3, and developing project alternatives for detailed evaluation. Three meetings will be conducted to develop a list of potential projects that can be implemented, to review the screening of these projects, and to select projects to evaluate in Task 5. In executing this task, the Committee will address the following questions:

4) What existing/planned infrastructure could be used to optimize the use of all sources of water and how would it be used?
5) What new infrastructure would be required to achieve the desired level of reliability and other benefits?

Task 5 – Develop reconnaissance-level engineering design and operating plan. The objective of this task is to characterize the performance and costs of the water supply reliability alternatives developed in Task 4. A reconnaissance-level engineering design and operating plan will be developed for each alternative. Each alternative design will include the approximate size, location, and alignment of major infrastructure, and will describe any potential implementation barriers for the project. A cost opinion will be determined for each alternative. This task includes evaluating alternatives based on the alternative evaluation criteria developed in Task 3, describing how the alternative could be implemented and financed, and recommending an alternative for implementation. The deliverable of this task will be a technical report that summarizes the work performed under Tasks 1 through 5, and it will include a plan to pay for the preliminary design and CEQA documentation of the recommended alternative. Five meetings will be conducted to review the design and estimated benefit of the recommended alternative; review the evaluation of the projects, based on the criteria developed in Task 3; and review the recommended list of projects for implementation; review the implementation plan; and review the technical report. In executing this task, the Committee will address the following questions:

6) How would the existing/planned/new infrastructure be operated to achieve the desired level of reliability and other benefits?
7) Are the capital and O&M costs of optimization less than the cost to agencies to manage supply and infrastructure challenges on their own?
8) What institutional arrangements are necessary to operate the facilities to achieve the benefits?

Task 6 – Plan, design, build water reliability alternatives. The objective of this task is to implement the recommendations of the technical report. This task includes (1) developing and implementing necessary agreements between participating Parties, (2) preparing the preliminary design of the recommended alternative, (3) preparing the environmental documentation for the recommended alternative and other alternatives that will tier-off the 2020 OBMP Update PEIR, (4) preparing a financial plan for constructing the recommended alternative, (5) preparing final design of the recommended alternative, (6) acquiring permits for constructing and operating the recommended alternative, and (7) constructing the recommended alternative.

Cooperative Efforts with Appropriate Entities to Implement Activity CG

This is a basin-wide activity that involves the Parties, the IEUA, the TVMWD, and the WMWD. Given its current efforts, the IEUA would be the logical entity to lead the implementation of Activity D on behalf of all Parties in these service areas, but the process could be led by others. In this role, the agency leading the project on behalf of the Parties would contract for planning and engineering services as required. Watermaster, TVMWD and WMWD would work with IEUA as needed to support the expansion of the planning efforts to cover non-IEUA member agencies. Watermaster would also participate in the process to ensure that Activity CG implementation is consistent with the Judgment, Peace Agreements and other agreements, and the Watermaster Rules and Regulations.

Implementation Actions, Schedule, and Costs for Activity CG

The recommended schedule to complete the scope of work described herein is described below:

Year one:

- Convene Water Supply Reliability Committee, define reliability and other benefits, and refine scope of work, schedule, and budget (Task 1).

Year two:

- Characterize the water demand, water supply plans, and existing/planned infrastructure and its limitations; and identify conceptual facilities and operational improvements that achieve reliability and other benefits defined in Task 1 (Task 2).
- Develop planning, screening, and evaluation criteria for water supply reliability projects (Task 3).
- Develop water reliability alternatives for evaluation (Task 4).

Year three:

- Conduct reconnaissance-level engineering study for the alternatives (Task 5).

Years four through seven:

- Recommend alternative for implementation (Task 5).
- Prepare final report, documenting work performed in Tasks 1 through 5 (Task 5).
- Watermaster, the IEUA, and other potential partners develop a project implementation agreement. The objective of this agreement is to define the roles of each partner in the planning, permitting, design, and implementation of the projects, and the cost allocations.
- Preliminary design of recommended projects. The level of design will be such that it enables the preparation of environmental documentation pursuant to CEQA and provides information for identifying the permits required for construction and operation.
- Prepare environmental documentation for alternatives. CEQA will cover the recommended alternative and other alternatives at the project level, based on the project descriptions developed in Task 5. This documentation will tier-off from the 2020 OBMP Update PEIR. Watermaster will conduct an MPI analysis in parallel with the CEQA process.

Years eight and nine:

- Prepare final designs and acquire permits for the selected alternative.

Years ten and beyond:

- Construct recommended alternative.

Exhibit CG-5 shows the estimated budget-level engineering cost to complete Tasks 1 and 2 which is about $305,000. The cost of Tasks 3 through 6 cannot be estimated until the completion of Task 2. And, because the IEUA is currently conducting its 2020 IRP (the scope of work for which overlaps with scope recommended herein), the cost may be lower than estimated if its work is leveraged.

Some of the facilities and associated operating plans identified under this activity may overlap with those envisioned in Activity EF and/or Activity B. If Activity EF and/or B and CG move forward, there will be cost savings related to facilities planning.

Activity K

Description of Activity K

Activity K defined by the stakeholders is:

> *Develop a management strategy within the salt and nutrient management plan to ensure the ability to comply with the dilution requirements for recycled water recharge.*

The objective of Activity K is to determine if compliance with recycled water recharge dilution requirements, defined in Watermaster and the IEUA's maximum benefit SNMP, can be achieved under existing management plans, and if not, to develop a plan to achieve compliance.

Through the listening session process, the stakeholders identified the following as potential outcomes of performing Activity K:

- Enable the continued and expanded recharge of recycled water, which will:
  - protect water quality,
  - improve water-supply reliability, especially during dry periods, and
  - protect/enhance Safe Yield.

The 2000 OBMP included PE 7—*Develop and Implement Salt Management Plan*—to characterize current and future salt and nutrient conditions in the basin and to subsequently develop and implement a plan to manage them. Such a management strategy was necessary to address historical salt and nutrient accumulation from agricultural operations and to support the aggressive expansion of recycled water recharge and reuse envisioned in PE 2 and PE 3/5. Recognizing that implementing the recycled water reuse program would require large scale treatment and mitigation of salt loading under the then-current antidegradation objectives for total dissolved solids (TDS) and nitrate, defined in the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan), Watermaster and the IEUA petitioned the Regional Board to establish a maximum benefit-based salt and nutrient management plan (maximum benefit SNMP) that involved (1) increasing the TDS and nitrate objectives for the Chino-North groundwater management zone[30] (GMZ) to numerically higher values to enable recycled water reuse without mitigation or treatment and (2) committing to a program of salt and nutrient management activities and projects ("maximum benefit commitments") that ensure the protection of the beneficial uses of the Chino-North GMZ and downgradient water resources (the Santa Ana River and the Orange County GMZ). The maximum benefit commitments included the implementation of a monitoring, analysis, and reporting program to track TDS and nitrate trends; the construction and future expansion of the Chino Basin Desalters to attain Hydraulic Control of the Chino-North GMZ to protect the Santa Ana River; the construction of recharge facilities to increase storm and recycled water recharge; and a commitment to future treatment of recycled water and/or groundwater, as needed, to protect beneficial uses and comply with the maximum benefit TDS and nitrate objectives. These are all activities that were planned to be implemented under the OBMP. The maximum benefit SNMP was incorporated into the Basin Plan in January 2004.

Activity K, as envisioned by the stakeholders, would entail an expansion on the existing analysis requirements in the maximum benefit SNMP to incorporate a forward-looking assessment of the ability to comply with the maximum benefit commitments. It would set up Watermaster and the IEUA to more

[30] The Chino-North GMZ has a maximum-benefit TDS objective of 420 mgl and is a combination of the Chino-1, Chino-2, and Chino-3 antidegradation GMZs that have lower TDS objectives ranging from 250 to 280 mgl.

proactively prepare a compliance plan as opposed to reacting to a trigger event that requires short-term, time-certain response actions.

Need and Function of Activity K

Maximum benefit SNMP commitments

Implementation of the maximum benefit SNMP is a regulatory requirement of the Basin Plan. It's also incorporated into Watermaster and the IEUA's recycled water recharge program permit (R8-2007-0039) and the IEUA's recycled water discharge and direct reuse permit (R8-2015-0021; NPDES No. CA 8000409). There are nine maximum benefit commitments included in the Basin Plan and recycled water permits:

1. The development and implementation of a surface-water monitoring program
2. The development and implementation of a groundwater monitoring program
3. The expansion of the Chino-I Desalter to 10 million gallons per day (mgd) and the construction of the Chino-II Desalter with a design capacity of 10 mgd
4. The additional expansion of desalter capacity to a total capacity of 40 mgd pursuant to the OBMP and the Peace Agreement
5. The construction of the recharge facilities included in the Chino Basin Facilities Improvement Program
6. The management of recycled water quality to ensure that the IEUA agency-wide, 12-month running average wastewater effluent quality does not exceed 550 mgl for TDS and 8 mgl for total inorganic nitrogen (TIN)
7. The management of the basin-wide, volume-weighted TDS and nitrate concentrations of artificial recycled, storm, and imported waters to concentrations that are less than or equal to the maximum benefit objectives as a five-year rolling average
8. The achievement and maintenance of Hydraulic Control of groundwater outflow from the Chino Basin, specifically from the Chino-North GMZ, to protect the water quality of the Santa Ana River and downstream beneficial uses
9. The periodic redetermination of "current" ambient TDS and nitrate concentrations of the Chino Basin GMZs (every three years).

Additionally, Watermaster and the IEUA are required to prepare an annual report to the Regional Board on the status of compliance with the maximum benefit commitments. If the maximum benefit commitments are not met to the Regional Board's satisfaction, the antidegradation objectives would apply for regulatory purposes. The application of the antidegradation objectives would result in a finding of no assimilative capacity for TDS and nitrate in the Chino-North GMZ, and the Regional Board would require mitigation for recycled water discharges to Chino-North that exceed the antidegradation objectives. Furthermore, the Regional Board would require that Watermaster and the IEUA mitigate the effects of discharges of recycled water that took place in excess of the antidegradation objectives under the maximum benefit objectives retroactively to January 2004. The mitigation for past discharges would be required to be completed within a ten-year period following the Regional Board's finding that the maximum benefit commitments were not met.

Current compliance with the recycled water dilution requirements of the maximum benefit SNMP

Commitment number 7 of the maximum benefit SNMP is the stakeholders' stated focus of Activity K. This commitment defines a compliance limit that if met, allows for the continued recharge of recycled water without mitigation. Hereafter, the limit will be referred to as the "dilution limit." Commitment number 7 requires that recycled water recharge be limited to the amount that can be blended, on a basin-wide, volume-weighted basis, with other sources of supplemental recharge to achieve five-year running-average concentrations that are less than or equal to the dilution limits. The dilution limits are the maximum benefit objectives: 420 mgl for TDS and 5 mgl for nitrate (as nitrogen). If the five-year, volume-weighted TDS or nitrate concentrations (hereafter, dilution metrics) exceeds the dilution limits, then Watermaster and the IEUA must develop a plan to come into compliance. Compliance options could include, but are not limited to, increasing the recharge of low-salinity supply sources (storm or imported waters), desalting recycled water to reduce salinity, or desalting groundwater as a salt offset.

Watermaster and the IEUA annually analyze and report on "current" compliance with the dilution limit as part of the *Chino Basin Maximum Benefit Annual Report*. The most recent annual report was submitted to the Regional Board in April 2019 and reported on compliance through December 2018.[31] Exhibits K-1 and K-2 are time-series charts that characterize compliance with the dilution limit since the recycled water recharge program began in 2005. The exhibits show the monthly recharge volumes and TDS and nitrate concentrations of each recharge source, the dilution metrics, and the dilution limits. Note that because recycled water recharge began in July 2005, the first five-year period for which the dilution metric was computed was July 2005 through June 2010.

Exhibits K-1 and K-2 illustrate that the TDS and nitrate dilution limits have never been exceeded. From June 2010 to December 2016, the TDS dilution metric increased from about 203 to 354 mgl. During the same period the nitrate dilution metric increased from 1.1 to 3.0 mgl. After December 2016, the TDS and nitrate dilution metrics decreased to 281 mgl and 2.0 mgl, respectively. As of 2018, the five-year, volume-weighted TDS dilution metric was 139 mgl less than the dilution limit, and the nitrate dilution metric was 3 mgl below the dilution limit.

Threats to compliance with the dilution limits

As suggested by Exhibit K-1, the primary threats to compliance with the TDS dilution limit are the availability of imported and storm waters for recharge. Increases in the TDS concentration of recycled water are also a threat to compliance. The threat of exceeding the nitrate dilution limit is far less given that the nitrate concentration of the recycled water recharge is typically less than the nitrate dilution limit of 5 mgl.

Imported water is a low-TDS source of recharge and has an important influence on the dilution metric. As shown in Exhibit K-1, the TDS concentration of imported water used for recharge ranged from 87 to 367 mgl. In mid-2016, the rate of increase of the TDS dilution metric rose significantly from about 1.3 mgl per month to 12 mgl per month through October 2016 when the metric peaked at 354 mgl. In October 2016, the five-year dilution metric calculation included almost no imported water recharge: the last significant period of imported water recharge occurred in May through September of 2011 (3,700 to 7,800 af). After peaking in October 2016, the dilution metric for TDS began to decrease and stabilize due to a large imported water recharge event that occurred from October 2016 through January 2018 (46,000 total af).

[31] WEI. (2019). *Optimum Basin Management Program Chino Basin Maximum Benefit Annual Report 2018*. April 2019.

A similar trend was observed for the dilution metric for nitrate, as shown in Exhibit K-2. These observations demonstrate the importance of imported water recharge to compliance with the dilution metric.

Stormwater is a more consistent source of recharge, but it occurs in smaller volumes than imported water recharge. Over the most recent five-year period (January 2014 to December 2018), the total volume of stormwater recharge was 39,000 af compared to 47,000 af of imported water. And, while stormwater TDS concentrations are typically low in the wet winter months (50 to 150 mgl), the TDS of dry-weather flows diverted to recharge in summer months are typically greater than 300 mgl. The implementation of the 2013 RMPU is expected to increase the annual average stormwater recharge volume, but even with increased recharge capacity, multiyear drought conditions with limited stormwater recharge opportunities could lead to compliance challenges.

During drought conditions there is: a reduction in the amount of high-quality stormwater recharge; limited or no availability of imported water for recharge; an increase in the TDS concentrations of imported water, if it is available for recharge; and a concomitant increase in the TDS concentrations of the recycled water. Not only are the two primary sources of low-TDS water less available during drought periods, but the source water quality of municipal water supplies is also higher in TDS due to increases in imported water TDS and indoor water conservation practices. Exhibit K-1 shows the influence of the most recent statewide drought, which occurred over 2013 to 2016, on the dilution metric. During this time the dilution metric for TDS steadily increased from about 210 mgl to 350 mgl. This analysis demonstrates the meaningful impact that drought has on compliance with the dilution metric and indicates that climate change, which is expected to result in longer, drier droughts, could potentially threaten future compliance with the dilution limit.

Other maximum benefit SNMP compliance challenges

There are other metrics in the maximum benefit SNMP commitments that would require the evaluation of potential salt offset projects to achieve compliance. Commitment number 6 requires that when the IEUA's agency-wide, 12-month, running-average recycled water effluent TDS concentrations exceeds 545 mgl for three consecutive months or the TIN concentrations exceeds 8 mgl in any one month, Watermaster and the IEUA must submit a water quality improvement plan and schedule to the Regional Board. The plan must demonstrate how the 12-month running-average IEUA agency-wide recycled water effluent will remain in compliance with its discharge permit limits of 550 mgl and 8 mgl for TDS and TIN, respectively.

Exhibit K-3 shows the monthly and 12-month running-average IEUA agency-wide effluent TDS and TIN concentrations for 2005 through 2018. In 2015, the 12-month running-average IEUA agency-wide TDS concentration in recycled water approached the 545 mgl action limit that would require the IEUA and Watermaster to submit a water quality improvement plan and schedule. In analyzing the available data, the IEUA determined that the primary drivers for the increasing recycled water TDS concentration were the increase in the TDS concentration of the water supplies used by its member agencies and an increase of the TDS waste increment from indoor water conservation.

Although the 12-month running-average IEUA agency-wide TDS concentration declined from the 2015 peak before reaching the 545 mgl action limit, it was an important indicator that the TDS concentration of recycled water is likely to approach or exceed the recycled water compliance limit during the next prolonged dry period and require the planning for recycled water quality improvements. In May 2017, recognizing the potential cost of implementing recycled water quality improvements for what might be only short-term exceedances of the 545 mgl action limit, Watermaster and the IEUA petitioned the Regional Board to consider updating the maximum benefit SNMP to incorporate a revised 12-month compliance metric for recycled water effluent (commitment number 6) specifically to allow a longer-term averaging period. The Regional Board agreed that an evaluation of the recycled water compliance metric is warranted and directed Watermaster and the IEUA to develop a technical scope of work to demonstrate the potential impacts of the revised compliance metric. The work began in September 2017 and is ongoing as of the writing of this Scoping Report. If the investigation finds that changing the recycled water compliance metric will not impact beneficial uses in the Chino Basin or cause downgradient water supplies to exceed water quality objectives, then it is likely that the alternative recycled water compliance metric will be approved. If approved, the Regional Board would amend the Basin Plan and the IEUA's permits to incorporate the revised maximum benefit commitments.

The primary objectives of the technical work to support the maximum benefit SNMP and permit updates are: to develop and use an updated groundwater solute transport model to evaluate the TDS and nitrate concentrations of the Chino Basin, to define alternative salinity management scenarios, and to project the future TDS and nitrate concentrations of the Chino Basin for each scenario. The results will be used to develop a regulatory compliance strategy that includes a longer-term average period for recycled water TDS concentrations that is acceptable to the Regional Board. The Regional Board has indicated that in accepting a proposal to modify the recycled water compliance limit, it will require Watermaster and the IEUA to add a new maximum benefit commitment to the Basin Plan that involves updating the TDS and nitrate projections every five years.

The compliance approach being pursued by Watermaster, the IEUA, and the Regional Board illustrates that the Regional Board may be willing to consider adopting an alternative dilution metric—e.g. a longer averaging period—for recycled and supplemental water recharge so long as there are no unmitigated impacts to beneficial uses. The work that is being performed to support the maximum benefit SNMP update can be directly leveraged to achieve the objective of Activity K.

Process required to evaluate potential future dilution compliance challenges

To achieve the objective of Activity K, it is necessary to prepare projections of the dilution metric to evaluate potential compliance challenges and to determine if and when it will be necessary to develop a plan to achieve compliance. The table below summarizes the planning data that are needed to prepare such projections and the existing Watermaster or IEUA programs that produce the planning data.[32]

Planning Data	Existing Watermaster and IEUA Efforts that Compile or Produce the Required Planning Data
Recycled water recharge volumes	Projections prepared through the RMPU process, the Recycled Water Program Strategy, and other efforts.
Recycled water quality	There is no current effort to prepare this projection at the requisite level of detail on a regular basis, but it can be calculated from projections of water supply quality; such a projection was just completed to support the maximum benefit SNMP update.
Imported water recharge volumes	Projections prepared through the RMPU process.

[32] Some additional planning data not listed here would also be required to run the Chino Basin Groundwater Model, which is updated and recalibrated at least every five years.

Planning Data	Existing Watermaster and IEUA Efforts that Compile or Produce the Required Planning Data
Imported water recharge quality	There is no current effort to prepare this projection at the requisite level of detail, but it can be estimated based on historical data; such a projection was just completed to support the maximum benefit SNMP update.
Stormwater recharge volumes	Projections prepared through the RMPU process.
Stormwater recharge quality	Estimates can easily be produced based on historical data.
Groundwater supply volumes	Water supply plans of the Parties are compiled at least once every five years for various Watermaster and IEUA efforts.
Groundwater supply quality	There is no current effort to prepare this projection at the requisite level of detail, which requires the use of a numerical groundwater solute transport model; such a model was just built to support the maximum benefit SNMP update and is being used to prepare groundwater quality projections.
Other water supply volumes	Water supply plans of the Parties are compiled at least once every five years for various Watermaster and IEUA efforts.
Other water supply quality	There is no current effort to prepare this projection at the requisite level of detail, but it can be estimated based on historical data; such a projection was just completed to support the maximum benefit SNMP update.

The planning data would be used to prepare projections of: municipal water supply and quality, imported water quality, recycled water quality, groundwater quality, and ultimately the TDS and nitrate dilution metrics. The projections would be done assuming a range of future cultural conditions (land use changes, population growth, etc.) and climate conditions. These projections would be analyzed to produce best-case and worst-case five-year, ten-year, 15-year, and 20-year recharge projections for imported and storm waters. The best- and worst-case projections of the dilution metric would be appended to the historical record to produce a bracketed series of dilution metric time histories to evaluate the risk of exceeding the dilution metric over a range of potential climate conditions in the short (5-year) and long (20-year) term.

If there is no projected compliance challenge in the next five to ten years, then no additional work would be needed to develop a compliance plan. It would be necessary to update the planning data and modeling tools to evaluate projections at a minimum of every five years. A five-year frequency is consistent with the State Board's 2018 amendments to the SNMP guidelines within its Recycled Water Policy.[33]

If a compliance challenge is projected, then it will be necessary to develop a plan to ensure compliance with the blending metric in the future. As previously noted, the compliance plan could include treatment

[33] The *Water Quality Control Policy for Recycled Water* is available at: https://www.waterboards.ca.gov/water_issues/programs/water_recycling_policy/

of the recycled water, increased recharge of high-quality imported water and/or stormwater, increase in groundwater desalting as a salt offset, or an update to the maximum benefit SNMP to change the compliance metric to a longer averaging period. For the latter, it would first be necessary to demonstrate to the Regional Board that a change to the compliance metric will not harm beneficial uses.

Alignment of Activity K with the current investigation to support the update to the maximum benefit *SNMP*

All of the above steps to analyze compliance challenges with the dilution metric are currently being performed in support of the update to the maximum benefit SNMP. Watermaster and the IEUA anticipate that the compliance strategy for the SNMP update will be finalized during FY 2020/2021. When completed the potential compliance challenges with the dilution limit will be known and a range of compliance plans will have been evaluated at a conceptual level. Thus, it may not be necessary to perform any work pursuant to Activity K, unless it is determined that some form salt offset is required. If no compliance challenges arise, or remain at the completion of the SNMP update, no significant work would need to be performed pursuant to Activity K for at least five years. If a salt offset is required, Watermaster and the IEUA would need to begin reconnaissance-level engineering planning in FY 2021/22.

Summary

In order to achieve the objectives of Activity K to ensure the ability to comply with the maximum benefit SNMP dilution metric in the future, Watermaster and the IEUA should expand the existing analysis and reporting efforts to periodically (every five-years), prepare future projections of recharge volumes and quality to determine if there is a compliance challenge, and if necessary, evaluate compliance alternatives. Projections of the dilution metric and an evaluation of compliance challenges in the future are currently being developed for the investigation to support the update to the maximum benefit SNMP described above. The scope of work to implement Activity K can leverage that work.

Scope of Work for Activity K

The scope of work to achieve the objectives of Activity K—*Develop a management strategy within the salt and nutrient management plan to ensure the ability to comply with the dilution requirements for recycled water recharge*—consists of five tasks:

- Task 1 – Prepare projection to evaluate compliance with recycled water dilution requirements
- Task 2 – Identify alternative compliance strategies
- Task 3 – Evaluate alternative compliance strategies
- Task 4 – Implement the alternative compliance strategy
- Task 5 – Periodically reevaluate compliance with dilution requirements

Task 1 – Prepare projection to evaluate compliance with recycled water recharge dilution requirements. The objective of this task is to prepare projections of compliance with the dilution metric for TDS and nitrate in the maximum benefit SNMP and determine if there is a compliance challenge in the future. In this task, all planning data will be compiled, Watermaster's groundwater solute transport model will be updated and used to estimate future groundwater and recycled water quality, and projections of the dilution metric will be prepared. The planning data will be used to evaluate the dilution metric for best-case and worst-case recharge conditions over a twenty-year period. If there are no projected compliance challenges within the next five years, then Tasks 2 through 4 will not need to be performed. If there is a compliance challenge within the next five years, then Tasks 2 through 4 will need to be performed. Task 5 would be performed regardless of the outcome.

Task 2 – Identify alternative compliance strategies. The objective of this task is to identify potential alternative compliance strategies to address foreseeable challenges with complying with the dilution limit in the future. This task includes the following subtasks:

- Develop planning, screening, and evaluation criteria for projects to comply with the maximum benefit SNMP dilution limit.
- Identify potential alternative compliance strategies.
- Perform initial screening of the alternative compliance strategies based on the evaluation criteria.
- Select alternative compliance strategies to evaluate in Task 3.

Task 3 – Evaluate alternative compliance strategies. The objective of this task is to characterize the performance and costs of the alternative compliance strategies defined in Task 2. A reconnaissance-level engineering design and operations will be developed for each alternative. The reconnaissance-level engineering work will include a description of the activity, description of facilities (if required), its ability to comply with the dilution limits, its impact on the TDS and nitrate concentrations of the Chino Basin, and the estimated cost to implement the project alternatives. The projects will be evaluated and ranked based on the criteria developed in Task 2, and an alternative compliance strategy will be selected. The deliverable for this task will include a technical document that describes the reconnaissance-level engineering design and operations, the selected alternative compliance strategy, and the scope of work and cost estimate to implement the selected alternative compliance strategy.

Task 4 – Implement the alternative compliance strategy. The objective of this task is to implement the selected alternative compliance strategy. This task includes (1) developing and implementing necessary agreements between participating Parties; (2) preparing a Basin Plan amendment, if necessary; (3) preparing preliminary designs of the recommended projects; (4) preparing the environmental documentation for the recommended projects (this will tier-off from the 2020 OBMP Update PEIR); (5) preparing financial plans to construct the recommended projects; (6) preparing final designs of the recommended projects; (7) acquiring necessary permits for constructing and operating the recommended projects; and (8) constructing the recommended projects.

Task 5 – Periodically re-evaluate compliance with dilution requirements. The objective of this task is to proactively evaluate future compliance with the maximum benefit SNMP recycled water dilution limit to address any foreseen compliance challenges. The task includes two efforts:

(1) Prepare projections of the dilution metric on a five-year frequency. This includes updating the model, collecting planning data, preparing the requisite projections (see Task 1), and evaluating if there is a compliance challenge. If it is determined that there is a compliance challenge, then Tasks 2 through 4 will be performed. If it is determined that there is not a compliance challenge, this evaluation will be redone in another five years.

(2) Annually report on current and future compliance with the dilution limit. Annual reporting of current compliance with the dilution metric is already done in the Chino Basin Maximum Benefit Annual Reports. This task would simply involve expanding that reporting discussion to include a comparison of the current dilution metric to the bracketed projections of the dilution metric prepared in Task 1. If the current dilution metric suggests there is a potential compliance challenge that was not predicted by Task 1, Watermaster and the IEUA would initiate a process to determine if additional evaluation of compliance alternatives is warranted.

Cooperative Efforts with Appropriate Entities to Implement Activity K

As co-permittees to the maximum benefit SNMP and recycled water recharge program, this activity involves Watermaster and the IEUA. Similar to the existing implementation of the maximum benefit

SNMP, Watermaster would lead the technical and reporting efforts, and any engineering planning work would be led by IEUA.

Implementation Actions, Schedule, and Costs for Activity K

As previously described, all the work required in Task 1 is currently being performed as part of Watermaster and the IEUA's investigation to support an update to the maximum benefit SNMP to change the recycled water TDS compliance metric to a longer averaging period. Watermaster and the IEUA anticipate that the work to update the compliance strategy for the maximum benefit SNMP will be completed during FY 2020/21. When completed the potential compliance challenges with the dilution limit will be known, and a range of compliance plans will have been evaluated at a conceptual level. Thus, it may not be necessary to perform any work pursuant to Activity K unless it is determined that some form salt offset project is required to address near-term compliance challenges. If no compliance challenges are identified or are resolved through the completion of the SNMP update, no significant work would need to be performed pursuant to Activity K for at least five years. If a salt offset project is required to address anticipated near-term compliance challenges, Watermaster and the IEUA will need to begin reconnaissance-level engineering planning in FY 2021/22 (Tasks 2 through 4).

The recommended schedule to complete the scope of work described herein is described below:

Year one:

- Wait for Watermaster and the IEUA to complete the maximum benefit SNMP update.

Year two:

- Identify alternative compliance strategies, if needed (Task 2).
- Start the evaluation of alternative compliance strategies, if needed (Task 3).
- Report the annual dilution metric compared to dilution limits and projections (Task 5).

Year three:

- Complete the evaluation of alternative compliance strategies, if needed (Task 3).
- Select preferred compliance plan and begin preparing implementation agreements, if needed (Task 4).
- Report the annual dilution metric compared to dilution limits and projections (Task 5).

Year four:

- Begin implementation the of compliance plan, if needed (Task 4).
- Report the annual dilution metric compared to dilution limits and projections (Task 5).

Year five and beyond:

- Reevaluate compliance with dilution requirements every five years (Task 5).

Exhibit K-4 shows the estimated budget-level engineering cost to complete Tasks 1 through 5. Given the ability to leverage the existing work being performed by Watermaster and the IEUA, there is no cost ($0) to perform Task 1. A cost estimate for Task 2 through 4 cannot be prepared because the outcome of the SNMP update is not yet known. It is premature to estimate the cost for performing the five-year update of the projections in Task 5, and there is no increased cost to performing the additional recommended annual reporting.

Activity L

Description of Activity L

Activity L defined by the stakeholders is:

> *Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance.*

The objective of Activity L is to refine the monitoring and reporting requirements of Watermaster to ensure that the objectives of each requirement are being met efficiently at a minimum cost. Through the listening session process, the stakeholders identified the following desired outcomes for Activity L:

- Ensure full compliance with regulatory requirements.
- Ensure full support of basin management initiatives.
- Enable the Parties to monitor the performance of the OBMP IP and related Court orders and regulatory obligations.
- Ensure cost efficiency.

The OBMP IP included PE 1 – *Develop and Implement Comprehensive Monitoring Program*. PE 1 was included in the OBMP to provide the information necessary to support the implementation of all other OBMP program elements and to evaluate their performance. The types of monitoring programs called for by PE 1 in the OBMP IP included:

- Groundwater-level monitoring
- Groundwater-quality monitoring
- Groundwater-production monitoring
- Surface-water discharge and quality monitoring (including managed artificial recharge)
- Ground-level monitoring
- Well construction, abandonment, and destruction

Activity L has identical objectives and desired outcomes to those of PE 1 because Watermaster continues to need data and information to comply with regulations, to fulfill its obligations under its agreements and Court orders, to comply with its requirements under CEQA, and to assess the performance of the evolving OBMP IP, including the 2020 OBMP Update. Financial resources to conduct these monitoring and reporting programs are limited, so through Activity L, the Parties desire to ensure cost efficiency in Watermaster's monitoring and reporting programs.

Need and Function of Activity L

Watermaster monitoring and reporting programs

Data and information acquired in Watermaster's monitoring and data-collection programs are used to prepare reports and data deliverables that are required by regulations and Watermaster's obligations under its agreements, Court orders, and CEQA. The table below is a list of each Watermaster monitoring and reporting requirement and the regulatory entities that require the monitoring and reporting.

Monitoring and Reporting Requirement	Regulatory Entity					
	Court	State Board	Regional Board	California DFW	California DWR	CEQA
Water Rights Compliance Annual Report		X		X		
SGMA Annual Report for Adjudicated Basins					X	
Biannual Evaluation of the Cumulative Effect of Transfers	X					
Biannual Evaluation of the Balance of Recharge and Discharge	X					
Annual Finding of Substantial Compliance with the Recharge Master Plan	X					
Annual Report of Compliance with SB 88 and SWRCB Regulations for Measurement and Reporting of Diverted Surface Water		X				
Safe Yield Recalculation	X					
Recharge Master Plan Update (RMPU)	X					
State of the Basin Report	X					
California Statewide Groundwater Elevation Monitoring Program (CASGEM)					X	
Chino Basin Maximum Benefit Annual Report			X			
Annual Report of the Prado Basin Habitat Sustainability Committee						X
Water Recycling Requirements for the Chino Basin Recycled Water Groundwater Recharge Program			X			
Annual Report of the Ground-Level Monitoring Committee	X					
OBMP Semi-Annual Status Reports	X					

Exhibit L-1 is a comprehensive description of each monitoring and reporting requirement listed in the table above, the associated data types required to meet the reporting requirement, the data analyses performed, the reporting content, and past efforts by Watermaster to reduce the scope and cost of the monitoring and/or reporting requirements.

The scope of the monitoring programs under PE 1 have evolved over time to satisfy new requirements associated with regulations and Watermaster obligations under its agreements, Court orders, and CEQA. In some instances, the monitoring programs have expanded to satisfy new basin-management initiatives and regulations. In some instances, the scope of the monitoring programs has been reduced with periodic reevaluation and redesign to achieve the monitoring objectives with reduced cost.

The following summarizes each of Watermaster's existing monitoring and data-collection programs. Watermaster compiles, checks, and stores the data collected under most of these programs in a centralized environmental database. The database and the database-management procedures ensure the quality and accuracy of the data, allow for efficient data exploration and analysis, and include standardized reports and data exports in formats for regulatory data deliverables or further analysis (e.g. creation of model input files).

Groundwater-production monitoring. Since 1978, Watermaster has collected information to estimate total groundwater production from the Chino Basin. Watermaster uses groundwater-production data to quantify and levy assessments pursuant to the Judgment. Estimates of production are also essential inputs to recalibrate Watermaster's groundwater flow model, which is used to inform redeterminations of the Safe Yield of the Chino Basin, evaluate the state of Hydraulic Control, perform MPI assessments, and support many other Watermaster initiatives. The Watermaster Rules and Regulations require groundwater producers that produce in excess of 10 afy to install and maintain meters on their well(s). Well owners that pump less than 10 afy are considered "Minimal Producers" and are not required to meter or report to the Watermaster. Exhibit L-2 depicts the groundwater-production monitoring program as of 2018. Members of the Appropriative and Overlying Non-Agricultural Pools and CDA record their own meter data and submit them to Watermaster staff on a quarterly basis. For Agricultural Pool wells, Watermaster performed a well-metering program to equip Agricultural Pool wells with in-line flow meters, where feasible. Watermaster staff visit and record production data from the meters at these wells on a quarterly basis. For the remaining unmetered Agricultural Pool wells, including Minimal Producer wells, Watermaster applies a "water duty" method to estimate their production on an annual basis. Watermaster continues its efforts to implement the well-metering program and improve its methods to estimate pumping at un-metered wells.

Groundwater-level monitoring. Watermaster's groundwater-level monitoring program supports many Watermaster management functions, including: the periodic assessment of Safe Yield, groundwater model development and recalibration, evaluating the cumulative impacts of transfers and the balance of recharge and discharge, subsidence management, MPI assessments, estimation of storage change, other scientific demonstrations required for groundwater management, and many regulatory requirements, such as the demonstration of Hydraulic Control and the triennial recomputation of ambient water quality. The wells within the southern portion of the basin were selected for inclusion in the monitoring program to assist in Watermaster's analyses of Hydraulic Control, land subsidence, desalter impacts to private well owners, and riparian vegetation in the Prado Basin. The density of groundwater-level monitoring near the CDA well fields is greater than in outlying areas because hydraulic gradients are expected to be steeper near the CDA well fields, and these data are needed to assess the state of Hydraulic Control. In FY 2017/2018, about 1,300 wells comprised Watermaster's groundwater-level monitoring program. Exhibit L-3 depicts the groundwater-level monitoring network of wells. At about 1,050 of these wells, well owners measure water levels and provide data to Watermaster. These well owners include municipal water agencies, private water companies, the California Department of Toxic Substance Control (DTSC), the County of San Bernardino, and various private consulting firms. The remaining 250 wells are private or dedicated monitoring wells that are mostly located in the southern portion of the Basin. Watermaster staff measures water levels at these wells once a month or with pressure transducers that record water levels once every 15 minutes. Wells monitored by transducers were preferentially selected to support Watermaster's monitoring programs for Hydraulic Control, Prado Basin habitat sustainability, land subsidence, and others where such high-frequency data are necessary to fulfill program objectives. To continue to support assessments of Hydraulic Control, and other analyses, it is anticipated that new monitoring wells will need to be constructed to replace the currently monitored private wells that will be lost as land is converted from agricultural uses to urban uses.

Groundwater-quality monitoring. The Watermaster's groundwater-quality monitoring program supports compliance for two maximum benefit commitments: the triennial ambient water quality recomputation and the analysis of Hydraulic Control. Groundwater-quality data are also used for Watermaster's biennial State of the Basin report, to support ground-water modeling, to characterize non-point source contamination and plumes associated with point-source discharges, to characterize groundwater/surface-water interactions in the Prado Basin area, and to characterize basin-wide trends in groundwater quality. Exhibit L-4 depicts the groundwater-quality monitoring network of wells. The groundwater-quality monitoring program relies on municipal producers, government agencies, and others to supply groundwater-quality data on a cooperative basis. Watermaster supplements these data through its own sampling and analysis program at private wells and monitoring wells in the area generally south of State Route 60. These wells include:

- *Private Wells*: Watermaster collects groundwater quality samples at about 85 private wells, located predominantly in the southern portion of the Basin. The wells are sampled at various frequencies based on their proximity to known point-source contamination plumes. 77 wells are sampled on a triennial basis, and eight wells near contaminant plumes are sampled on an annual basis.
- *Watermaster/IEUA Monitoring Wells*: Watermaster collects groundwater quality samples at 22 multi-nested monitoring sites located throughout the southern Chino Basin. There is a total of 53 well casings at these sites. These include nine HCMP monitoring sites constructed to support the demonstration of Hydraulic Control, nine sites constructed to support the Prado Basin Habitat Sustainability Program (PBHSP), and four sites that fill spatial data gaps near contamination plumes in MZ3. Each nested well site contains up to three wells in the borehole. The HCMP and MZ3 wells are sampled annually. The PBHSP wells are sampled quarterly to triennially.
- *Other Wells*: Watermaster collects samples from four near-river wells quarterly. The data are used to characterize the interaction of the Santa Ana River and groundwater in this area. These shallow monitoring wells along the Santa Ana River consist of two former USGS wells and two Santa Ana River Water Company wells.

For the period 2013 to 2018, water quality data were obtained from a total of 1,357 wells within and adjacent to the Chino Basin. Of those, 650 wells were sampled during FY 2017/2018. To continue to support the triennial ambient water quality recomputation, and other analyses, it is anticipated that new monitoring wells will need to be constructed to replace the currently monitored private wells that will be lost as land is converted from agricultural uses to urban uses.

Surface-water and climate monitoring. Watermaster's surface-water and climate monitoring program supports many Watermaster management functions, including: groundwater model development and recalibration, the periodic assessment of Safe Yield, evaluating the cumulative impacts of transfers and the balance of recharge and discharge, MPI assessments, recharge master planning, the PBHSP, compliance with the recycled-water recharge permit, and the maximum benefit program, among others. Exhibit L-5 depicts the surface-water and climate monitoring network of surface-water discharge sites and atmospheric monitoring stations. Much of these data are collected from publicly available datasets, including POTW discharge data, USGS stream gaging station data, and precipitation and temperature data measured at public weather stations or downloaded from spatially gridded datasets. Watermaster collects stormwater, imported water, and recycled water recharge data from the IEUA. Watermaster also collects quarterly surface-water quality samples from two sites along the Santa Ana River to support the Maximum Benefit program.

Ground level monitoring. The Watermaster's ground-level monitoring program is conducted pursuant to the Chino Basin Subsidence Management Plan. The objective of the plan is to minimize or abate the occurrence of land subsidence and groundwater fissuring within the Chino Basin. Exhibit L-6 depicts the ground-level monitoring program, which is focused across the western portion of Chino Basin within defined Areas of Subsidence Concern—areas of Chino Basin that are susceptible to land subsidence. The ground-level monitoring program consists of the following:

- Watermaster conducts high-frequency, piezometric level monitoring at about 60 wells as part of its ground-level monitoring program. A pressure-transducer/data-logger is installed at each of these wells and records one water-level measurement every 15 minutes. Data loggers also record depth-specific piezometric levels at the piezometers located at Watermaster's Ayala Park Extensometer and Chino Creek Extensometer facilities once every 15 minutes.
- Watermaster installed two extensometers in the MZ1 Managed Area to support the MZ1 Interim Monitoring Program and two extensometers in the Southeast Area understand the effects of pumping at the newly constructed Chino Creek Well Field. Both extensometer facilities record the vertical component of aquifer system compression and expansion once every 15 minutes, synchronized with the piezometric measurements, to understand the relationships between piezometric changes and aquifer-system deformation.
- Watermaster monitors vertical ground-motion via traditional elevation surveys at benchmark monuments and via remote sensing (InSAR) techniques established during the IMP. Elevation surveys are typically conducted in the MZ1 Managed Area, Northwest MZ1 Area, Northeast Area, and Southeast Area once per year. Vertical ground-motion data, based on InSAR, are collected about every two months and analyzed once per year.
- Watermaster monitors horizontal ground-surface deformation across areas that are experiencing differential land subsidence to understand the potential threats and locations of ground fissuring. These data are obtained by electronic distance measurements (EDMs) between benchmark monuments in two areas: across the historical zone of ground fissuring in the MZ1 Managed Area and across the San Jose Fault Zone in Northwest MZ1.

Watermaster convenes a Ground-Level Monitoring Committee (GLMC) annually to review and interpret data from the ground-level monitoring program. The GLMC prepares annual reports that include recommendations for changes to the monitoring program and/or the Subsidence Management Plan, if such changes are demonstrated to be necessary to achieve the objectives of the plan.

Biological monitoring. The Watermaster's biological monitoring program is conducted pursuant to the adaptive monitoring program (AMP) for the Prado Basin Habitat Sustainability Program (PBHSP). The objective of the PBHSP is to ensure that groundwater-dependent riparian habitat in Prado Basin will not incur unforeseeable significant adverse effects due to implementation of the Peace II Agreement. Exhibit L-7 depicts the Riparian Habitat Monitoring Program (RHMP) for the PBHSP. It produces a time series of data and information on the extent and quality of the riparian habitat in the Prado Basin over a historical period that includes both pre- and post-Peace II implementation. Two types of monitoring and assessment are performed: regional and site-specific. Regional monitoring and assessment are appropriate because the main potential stress associated with Peace II activities is the regional drawdown of groundwater levels. The intent of site-specific monitoring and assessment is to verify and complement the results of the regional monitoring.

- Regional monitoring of riparian habitat: Regional monitoring and assessment of the riparian habitat is performed by mapping the extent and quality of riparian habitat over time using: (i) multi-spectral remote-sensing data, Normalized Difference Vegetation Index (NDVI), and (ii) air photos.

- Site-specific monitoring of riparian habitat: Site-specific monitoring performed in the Prado Basin includes field vegetation surveys and seasonal ground-based photo monitoring. The most current vegetation survey conducted for the PBHSP was performed by the United State Bureau of Reclamation (USBR) in 2016, consisting of 38 sites in the Prado Basin: 24 previously established USBR sites and 14 new sites primarily located near the PBHSP monitoring wells.

Watermaster convenes the Prado Basin Habitat Suitability Committee (PBHSC) annually to review and interpret data from the RHMP. The PBHSC prepares annual reports that include recommendations for RHMP and other monitoring for the PBHSP, if such changes are demonstrated to be necessary to achieve the objectives of the PBHSP.

Water-supply and water-use monitoring. Watermaster compiles water supply and use data from the Parties to support two required reporting efforts: the Watermaster Annual Report to the Court and annual reporting requirements for adjudicated basins pursuant to the Sustainable Groundwater Management Act (SGMA). Monthly water use volumes for supply sources other than Chino Basin groundwater are collected from the Parties; this includes groundwater from other basins, recycled water, imported water, and native surface water. This data is collected and compiled twice per year to support fiscal year reporting for the Annual Report and water year reporting for the SGMA.

Planning information. Watermaster periodically compiles future water supply plans from the Parties. The data collected as part of that process represents the Parties' best estimates of their demands and associated water supply plans and are used for future planning investigations (e.g. Safe Yield recalculations and recharge master plan updates). The data collected includes:

- Water supply plans of the Watermaster Parties, including:
    - i. Projected total water demand
    - ii. Projected amount of each water supply by source to meet the projected water demand
    - iii. Monthly distribution of demand and water supplies used to meet the demand
    - iv. Projected groundwater pumping at each currently active well and future planned wells
    - v. Groundwater pumping schedules (well use priorities and capacities)
    - vi. Pumping capacities, required pumping combinations, and sustainable pumping levels (pumping sustainability metric) at each well
- Assumptions for how:
    - vii. Managed storage will be used to meet Replenishment Obligations.
    - viii. Lands currently in agricultural uses will be converted to urban uses.
    - ix. Additional potential conservation above that currently required for new land development will occur.
- Future projections of location and magnitude of storm and Supplemental Water recharge

Well construction, abandonment, and destruction. Watermaster maintains a database on wells in the basin and Watermaster staff makes periodic well inspections. Watermaster staff sometimes finds a new well while implementing its monitoring programs. Watermaster needs to know when new wells are constructed as part of its administration of the Judgment. Valuable information for use in managing the Chino Basin is developed when wells are constructed, including: well design, lithologic and geophysical logs, groundwater level and quality data, and aquifer stress test data. Well owners must obtain permits from the appropriate county and state agencies to drill a well and to put the well in use. Watermaster has developed cooperative agreements with the Counties of Los Angeles, Orange, Riverside, and San Bernardino, and DDW to ensure that the appropriate entities know that a new well has been constructed. Watermaster staff makes best efforts to obtain well design, lithologic and geophysical logs, groundwater level and quality data, and aquifer stress test data. The presence of abandoned wells is a threat to groundwater supply and a physical hazard. Watermaster staff periodically reviews its database, makes appropriate inspections, consults with well owners, maintains a list of abandoned wells in the Chino Basin, and provides this list to the counties for follow-up and enforcement. The owners of the abandoned wells are requested to properly destroy their wells following the ordinances developed by the county in which the abandoned well is located.

Considerations for updating the monitoring and reporting programs

Financial resources are limited, and the Parties desire to conduct these monitoring and reporting programs to satisfy each requirement efficiently at minimum cost. As documented in Exhibit L-1, the scope of Watermaster's monitoring and reporting programs has evolved over time with new or changing regulations, obligations, and management initiatives.

Watermaster staff and its engineer continually review and revise the monitoring programs to collect the minimum data necessary to meet the objectives of the monitoring and reporting requirements. In some instances, Watermaster convenes special committees to analyze monitoring data and develop recommendations for revisions to the programs. What has not been performed by Watermaster in the recent past is a comprehensive review of all monitoring and reporting programs in an open stakeholder process.

To achieve the Parties' desire to satisfy all monitoring and reporting requirements at minimum cost, Activity L should begin with a comprehensive review of each of Watermaster's requirements for monitoring and reporting and a discussion of if and how the programs could be revised. The review should be performed in an open stakeholder process should consider:

- the objectives of the monitoring and reporting program,
- the minimum datasets required to meet the objectives,
- the prospective loss of private (or other) wells that are currently used in the Watermaster's monitoring programs and how they can be cost-effectively replaced over time,
- the methods used to analyze the data, and
- the reporting frequency and content.

In some cases, revision of the monitoring and reporting programs will require Court approvals, regulatory approvals, or modification/amendment to CEQA documents.

Ultimately, Activity L will produce a *Monitoring and Reporting Work Plan* that documents the programs and will be used to define the Watermaster's annual monitoring scope and budget. The *Monitoring and Reporting Work Plan* will be updated as needed to respond to changed conditions within any of the programs with opportunity for input and feedback from the Parties.

Scope of Work for Activity L

The scope of work for Activity L – *Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance* consists of the following tasks:

- Task 1 – Convene Monitoring and Reporting Committee and prepare the *Monitoring and Reporting Work Plan*
- Task 2 – Implement recommendations in *Monitoring and Reporting Work Plan*

- Task 3 (recurring future task) – Conduct monitoring and reporting programs and prepare annual updates to Monitoring and Reporting Work Plan

Task 1 – Convene Monitoring and Reporting Committee and prepare the Monitoring and Reporting Work Plan. The objectives of this task are to:

- Update the Parties on all Watermaster monitoring and reporting requirements associated with regulations and obligations under its agreements, Court orders, and CEQA.
- Review the current monitoring and reporting programs that are designed to satisfy all Watermaster requirements.
- Develop recommendations for a revised monitoring and reporting program, including a scope of work and cost estimates to implement the recommendations.
- Document all Watermaster monitoring and reporting programs in a *Monitoring and Reporting Work Plan*. For each monitoring program, the work plan will include: a statement of objectives/requirements, the monitoring program to satisfy the requirements, the methods for evaluating data, the frequency for data analysis and reporting, and a schedule for initiating future updates to the plan, including construction of new monitoring wells (if needed).
- Prepare a technical memorandum to document the recommendations and a proposed process to revise the monitoring and reporting programs that require specific regulatory and/or Court approvals for modification. The memorandum will describe the anticipated cost savings that the Parties will realize if the revisions to the monitoring and reporting programs are approved. The memorandum will be titled: *Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs*.

A series of six committee meetings will be conducted over an 18-month period to achieve these objectives.

Task 2 – Implement recommended revisions to Watermaster's non-discretionary monitoring and reporting programs. In this task, the plan described in the *Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs* will be implemented. This task will likely require technical demonstrations to the appropriate regulatory body (e.g. Regional Board, the Court, etc.) to gain approval for revisions to the monitoring program, report content, and/or report frequency. This task may be a multi-step, multi-year process to implement all recommended revisions. The results of this task will result in future updates to the *Monitoring and Reporting Work Plan*. Updates will be incorporated as they are approved.

Task 3 (recurring future task) – Bi-Annual review of scope of work and cost to implement the Monitoring and Reporting Work Plan in the subsequent fiscal year. In the first quarter of every other calendar year, the Monitoring and Reporting Committee will meet to review any changes to the *Monitoring and Reporting Work Plan* and the scope of work and budget for the subsequent fiscal year. The work plan updates and subsequent fiscal year budget will incorporate the recommendations made by special committees (such as the Ground-Level Monitoring Committee), any approved changes resulting from work performed in Task 2, and other changed conditions of the monitoring and reporting programs. The annual review can also include discussion and consideration of additional recommendations for efficiencies suggested by the Parties.

Cooperative Efforts with Appropriate Entities to Implement Activity L

This is a basin-wide activity that involves the Parties. Watermaster's role will be to convene the Monitoring and Reporting Committee; to coordinate and administer its activities and meetings; to ensure that the recommendations derived from this effort are consistent with the Judgment, Peace Agreements and other agreements, Court orders, state and federal regulations, and CEQA requirements; and to execute the *Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs*.

Implementation Actions, Schedule, and Costs for Activity L

The recommended schedule to complete the scope of work is described below:

Year one and two:

- Convene Monitoring and Reporting Committee and prepare the *Monitoring and Reporting Work Plan*.
- Prepare memorandum: *Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs*.

Year three and beyond:

- Implement *Recommended Revisions to Watermaster's Non-Discretionary Monitoring and Reporting Programs*.
- Perform bi-annual review of scope of work and cost to implement the *Monitoring and Reporting Work Plan*.

Exhibit L-8 shows the estimated budget-level cost opinion to complete Task 1, which is about $165,000. The cost of Tasks 2 and 3 cannot be estimated until the completion of Task 1.

Activities H, I, and J

Description of Activities H, I, and J

Activities H, I, and J as defined by the stakeholders are intended to equitably allocate and minimize the cost of OBMP implementation. The fourth goal of the 2000 OBMP and the 2020 OBMP Update is to *Equitably Finance the OBMP*. As described in Section 3 of this Scoping Report, the intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation. Three of the activities defined by the stakeholders address equity and cost.

Activity H is to:

> *Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP Update agreements*

Activity I is to:

> *Develop regional partnerships to implement the OBMP Update and reduce costs and include in the OBMP Update agreements*

Activity J is to:

> *Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update*

Through the listening session process, the stakeholders identified the following desired outcomes from Activities H, I, and J:

- Provide transparency as to the benefits of the OBMP Update activities, including identification of who benefits.
- Clearly identify Watermaster's roles in OBMP implementation and the associated future assessment costs to the Parties.
- Provide information needed to plan financial resources, such as cost projections similar to a Master Plan process.
- A formal process to revisit the OBMP implementation plan and adjust priorities and schedules as necessary to address changed conditions.
- Improve readiness to apply for grants as they become available.
- Increase the likelihood that the OBMP will be implemented.
- Keep the cost of OBMP implementation as low as possible by obtaining grants and low-interest loans.

As noted above, the fourth goal of the 2000 OBMP is to equitably finance the OBMP, however there were no PEs in the OBMP IP related to this goal. The Peace and Peace II Agreements and OBMP project implementation agreements established cost allocations for certain activities. The benefit and cost allocations included in these agreements were based on negotiations among the Parties and encouraged the use of grant funding to build projects. These funding agreements were deemed equitable when they were developed, and they are in use today.

Together, the management framework of the OBMP IP and implementation agreements enabled the Parties to obtain tens of millions of dollars in grants and other outside funding to implement the 2000 OBMP, including for the Chino Basin Desalters, RMPU recharge facilities, and the recycled water recharge program. In 2018, a contingent grant in the amount of $200 million was awarded to IEUA for the regional CBP Storage and Recovery Program.

Need and Function of Activities of H, I, and J

Benefits of the OBMP

To support the Parties' consideration of the Peace II Agreement, Watermaster contracted with Dr. David L. Sunding to prepare the *Report on the Distribution of Benefits to Basin Agencies from the Major Program Elements Encompassed by the Peace Agreement and Non-Binding Term Sheet*. The economic analysis estimated the costs and benefits of the implementation of the PEs encompassed by the Peace I and Peace II Agreements to the ten Chino Basin appropriator Parties with the largest water rights in the Judgment (they are listed in the table below). These ten Parties account for 91.2 percent of the Operating Safe Yield. The allocation of aggregate costs and benefits to the individual agencies in the basin was computed based on a complex set of legal rules (such as share of Operating Safe Yield), cost-sharing arrangements for implementation, and market forces. The estimated net present value benefits, expressed in 2007 dollars (2007$), to the Parties were primarily based on the value of (1) the gains in pumping created by implementation of the agreements and (2) the offset of the purchase of Tier 2 supplies from Metropolitan for replenishment. The study estimated that together the Peace I and Peace II Agreements would provide over $904 million dollars in net present value benefits to the Parties (2007$) for the implementation period of 2007 to 2030. The following table summarizes the net benefits to the ten agencies, as reported by Sunding:

Party	Net Benefit (2007$)
Chino	$95,966,000
Chino Hills	$73,537,000
Ontario	$232,271,000
Upland	$44,086,000
CVWD	$278,128,000
Fontana	$30,268,000
MVWD	$40,480,000
SAWCo	$7,136,000
Jurupa	$35,254,000
Pomona	$67,537,000
Total	$904,663,000
Average	$90,466,300

Based, at least in part, on these expected benefits, the Parties executed the Peace II Agreement.

During the listening session process, some stakeholders expressed opinions that the distribution of benefits projected by the Sunding work had not come to fruition, that there is a lack of clarity as to the distribution of benefits of the various PEs in the OBMP IP, and that the allocation of the cost of OBMP implementation may not be equitable. And, some stakeholders have expressed concern about participating in new or expanded efforts without first understanding the benefits received to date, performing an analysis of potential future benefits, and assessing the equitable allocation of benefits and costs.

Since the Sunding report was published, no additional work has been done to quantify the benefits that have resulted from OBMP implementation or to update the projection of benefits based on changed conditions. In 2013, the Appropriative Pool Parties discussed performing an updated economic analysis, but ultimately, they elected not to do it.

Costs of the OBMP

The costs of OBMP implementation include, among others:

- Watermaster expenses for engineering work to implement the OBMP IP, including implementation costs of certain projects (e.g. monitoring/reporting and construction of extensometers and monitoring wells)
- Watermaster expenses for other project costs, including recharge debt payments, improvement projects, recharge operations and maintenance costs, recharge, and the Pomona Credit
- Desalter replenishment and related monitoring expenses
- IEUA recycled water recharge costs
- Individual agency costs for water management activities impacted by the OBMP

As previously noted, the Peace and Peace II Agreements and OBMP project implementation agreements established cost allocations for certain activities. Watermaster-related costs for OBMP implementation are assessed annually as part of the Assessment Package. No calculation of the total OBMP costs incurred to date has been performed.

Benefits and costs of the 2020 OBMP Update

Some of the tasks within the 2020 OBMP Update activities provide broad benefit to the Parties and are essential to the Watermaster to do its job to implement the Physical Solution. Some 2020 OBMP Update activities could result in the construction of projects that will provide benefits to all stakeholders or may only provide benefits to a subset of stakeholders.

Based on the scopes of work described herein for the 2020 OBMP Update activities (A, B, CG, D, EF, K and L), there are at least 2-4 years of scoping and preliminary engineering work that would need to be performed to evaluate and select projects envisioned by the 2020 OBMP Update activities and to develop the level of detail required to quantify the benefits and costs from project implementation. Exhibit HIJ-1 illustrates the four phases of work and associated schedule for each of the 2020 OBMP Update activities, assuming that all activities would be initiated in July 2020.[34] The phases shown are: (1) scoping, (2) evaluation of the need for projects, (3) project alternatives evaluation, and (4) project implementation. The exhibit also illustrates the go-no-go decision points to proceed with the activity.

The detail required to quantify the benefits and costs of projects (including ongoing needs for monitoring and assessment) would be developed during the project alternatives evaluation phase. Once the benefits and costs for projects are quantified, the Parties will be able to review them, consider whether or not they want to participate in projects that provide benefits to participants only, and establish equitable cost allocations for the implementation actions that provide specific benefits.

[34] This exhibit is for demonstrative purposes as the parties have yet to finalize the activities for inclusion in the OBMP Update or define a scheduled to implement them.

Grant funding and regional partnerships to minimize the costs of OBMP implementation

In the future, it is anticipated that it will become increasingly difficult to secure grants and low-interest loans due to increased competition. Most grant and low-interest loan programs require, or heavily favor, projects that are within watersheds and groundwater basins with adopted integrated regional management plans, groundwater sustainability plans, or their equivalents. The 2020 OBMP Update is equivalent to a regional water resources and groundwater management plan. The first three phases of each activity described in the prior subsection and shown in Exhibit HIJ-1 should be completed to maximize the ability to be competitive when applying for grants and low-interest loans, or in securing regional funding partners. Assessing cost/benefit at a level of detail appropriate to meet the needs of the stakeholders in establishing equitable cost allocations during the project alternatives evaluation phase will enable the Parties (1) to evaluate projects in a manner that is comprehensive and clear and (2) to enter into regional partnerships and apply for grant opportunities with greater certainty as to the expected benefits and costs.

Scope of Work for Activities H, I, and J

The objectives for Activities H, I, and J can be efficiently met by incorporating tasks within the other activities to characterize the benefits and costs of the projects produced by the activities. This section describes how the scopes of work of the other 2020 OBMP Update activities can accomplish the objectives of Activities H, I, and J.

As described throughout this Scoping Report, each activity has tasks related to identifying and evaluating project alternatives to achieve the activity's objectives (e.g. project evaluation). The project evaluation phase includes the following generalized steps:

1. Develop planning, screening, and evaluation criteria for projects
2. Identify the potential project alternatives
3. Develop reconnaissance-level engineering design and operating plans for each alternative
4. Develop an engineering cost opinion for each alternative
5. Describe how each alternative could be implemented and financed
6. Evaluate project alternatives based on the evaluation criteria
7. Select the preferred project alternative

At such time that each activity reaches the project evaluation phase, the scope of work for project evaluation should include a process to articulate and value the benefits of interest to the stakeholders in establishing equitable cost allocations, considering whether a project has broad basin management benefits and the benefits to specific Parties. Examples of benefits include new yield, water supply reliability, and water quality improvements. The project benefits to analyze and value would be defined during the first step to develop criteria for selecting projects. In step five, the alternative evaluation would include a characterization of implementation benefits and costs (Watermaster expenses and other costs) and their allocation to participants under various levels of participation and cost allocation methods. The benefit and cost projections, together with the other engineering analyses, could then be used by the Parties to select a cost allocation method, prepare projections of costs to support planning of financial resources for implementation, and develop a project implementation agreement that will clearly establish the allocation of benefits and costs to each Party. With regard to the identification and valuation of benefits, the Parties could address this on a case-by-case (project-by-project) basis, or by developing and agreeing to a standard set of benefits to analyze and quantify for every project to achieve equitable cost allocations.

The steps to achieve an equitable allocation of benefits and costs should be addressed in the agreement that will be developed by the Parties to implement the 2020 OBMP Update. The 2020 OBMP implementation agreement could be designed to ensure that the desired extent of cost/benefit assessments are performed to support equitable cost allocations in the implementation of activity scopes of work, to anticipate and accommodate the development of project implementation agreements that define the project-specific cost/benefit allocation, and to periodically update cost projections for implementation of the 2020 OBMP Update activities and associated projects to support planning of financial resources.

Cooperative Efforts with Appropriate Entities to Implement Activities H, I, and J

The Parties that will participate in projects developed through the implementation of the 2020 OBMP Update activities would need to agree to an allocation of costs for the implementation of the projects and document the allocation in the project implementation agreements. Watermaster's role will be to assess certain costs associated with implementation. Watermaster will continue to assess the costs of ongoing OBMP implementation efforts that provide broad benefits to the Parties pursuant to existing agreements and would allocate costs of the implementation of new activities/projects based on the new implementation agreements developed for the 2020 OBMP Update.

Implementation Actions, Schedule, and Costs for Activities H, I, J

Other than the performance of tasks associated with the assessment of benefits and costs within each 2020OBMP Update activity, there are no separate implementation actions associated with this activity as the future implementation agreements will make such considerations. Depending on the types of benefits that need to be quantified and valued to define equitable cost allocations, the project evaluation costs estimated herein for Activities A and D could be higher. (Note that these are the only two activities that have budget-level cost-estimates for project evaluation).

The *2020 OBMP Update: Implementation Plan Report*, which is the next work product of the 2020 Update, will include an implementation plan and schedule for each of the 2020 OBMP Update activities selected for implementation by the stakeholders and a projection of associated Watermaster costs to support the planning of financial resources for implementation.

Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ⚫ Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 3*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural			Overlying Non-Ag								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Reductions in Chino Basin Safe Yield																						
Develop a storage management plan to optimize the use of unused storage space in the basin, avoid undesirable results, and encourage Storage and Recovery Programs	🔴	🔴		🔴	🔴			🔴	🔴	🔴	🔴		⚫		🔴		🔴				B, C	1, 2, 3
Design storage management and storage & recovery programs that maintain or enhance Safe Yield	🔴	⚫						🔴	🔴	⚫			🔴		⚫		⚫			⚫	B, C	1, 3
Maintain or enhance the Safe Yield of the basin without causing undesirable results	🔴	⚫		🔴	🔴			🔴	🔴	🔴	⚫				⚫		⚫			🔴	B, D	1, 3
Manage the basin Safe Yield for the long-term viability and reliability of groundwater supply	🔴	⚫						🔴	🔴	🔴	🔴			🔴			⚫	⚫		🔴	A, B, C	1, 3
Reassess the frequency of the Safe Yield recalculation	⚫				⚫												⚫				I	3
Continue to model and track Safe Yield, but utilize other management strategies to address a decline.																	⚫				B	1, 3
Develop recharge programs that maintain or enhance Safe Yield	🔴	⚫					⚫	⚫	🔴	⚫					⚫		⚫			⚫	A, B	1, 3
Develop more facilities to capture, store, and recharge water	⚫	🔴					🔴			⚫	⚫				⚫		⚫				A, B, D	1, 2
Enhance recharge in northeast MZ-3	⚫		⚫						🔴								⚫				A, C	1, 3
Maximize use of existing recharge facilities	⚫	⚫						⚫	🔴	⚫											A, C, F, G	3
Establish incentives to encourage recharge of high-quality imported water	⚫		⚫																		H, I	2, 3
Develop an OBMP Update that is consistent with the Physical Solution and allows access to the basin for users to meet their requirements	🔴	⚫				🔴		🔴													C, E	3
Engage with regional water management planning efforts in the Upper Santa Ana River Watershed that have the potential to impact Chino Basin operations or Safe Yield	⚫														🔴		⚫			🔴	I, D	3

Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ⚫ Want/Unspecified

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	Appropriative										Agricultural			Overlying Non-Ag								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Inability to Pump Groundwater with Existing Infrastructure																						
Pursue collaborative, regional partnerships to implement regional solutions to water management challenges	⚫			⚫	⚫			⚫							🔴	⚫	⚫	⚫	🔴	🔴	B, E, F, G, I	3
Ensure that sufficient, reliable water supplies will be available to meet current and future water demands	🔴	🔴	🔴	🔴			⚫	🔴	⚫	⚫	⚫				🔴	⚫	⚫	🔴	⚫		A, B, D, G	1, 3
Develop conjunctive use agreements that provide certainty in the ability to perform during put and take years by clearly defining facilities/infrastructure and operating plans, and that leverage the lessons learned from obstacles encountered during the implementation of the current Dry Year Yield program	⚫						⚫	⚫	⚫						⚫		⚫	⚫			B, G, I	1, 2, 3
Develop management strategies that enable the Parties to produce or leverage their respective water rights that may be impacted by physical basin challenges like land subsidence or water quality	🔴						⚫	🔴							⚫		⚫				A, C, D, E, F, G, I	3
Design storage management and storage & recovery programs to raise funding to build infrastructure	⚫			⚫											⚫		⚫				B, D, I, J	3, 4
Develop process to support/facilitate project implementation	⚫																				F, H, J	4
Design subsidence management plans to allow flexibility in the location and volume of groundwater production in MZ-1 and MZ-2	⚫						⚫	🔴		🔴				⚫	⚫						A, C, G	3

Appendix C

Table 1

Issues, Needs and Wants of the Chino Basin Stakeholders

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Increased Cost of Groundwater Use																						
Seek supplemental financial resources to support the implementation of the OBMP Update	🔴	🔴		●			●	🔴	🔴	●					●	🔴	●		●		D, F, G, I, J	4
Develop regional partnerships to help reduce costs	●			●			●	●	🔴						🔴	●	●			●	F, G, I, J	4
Monetize agencies' unused water rights for equitable balance of basin assets			●																		G, H	4
Decrease Watermaster assessment costs	●				●			●													I, J	4
Support to develop a justification for increases in water rates and developer fees to invest in needed water infrastructure	🔴	●							●								●				F, G, H	
Develop an equitable distribution of costs/benefits of the OBMP	●	●		●		🔴	●	🔴	🔴	●				🔴	●						H, J	4
Watermaster assessments for implementation of the OBMP should be allocated based on benefits received	●				●																H	4
Continue or enhance incentives to pump groundwater from the Chino Basin			🔴																		G, I	3, 4
Improve flexibility for Parties to execute water rights transfers														🔴							G, I	4

Appendix C

Table 1

Issues, Needs and Wants of the Chino Basin Stakeholders

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Chino Basin Water Quality Degradation																						
Develop a water quality management plan to ensure ability to produce groundwater rights	🔴	●		●			●	●	●	●				🔴	●		●	●			E, F, G, J	2, 3
Develop regional infrastructure to address water quality contamination and treatment				●	●			●													A, B, C, E, F, G, I, J	2
Plan for and be prepared for new drinking water quality regulations that may result in an increase in groundwater treatment and costs	●	●	🔴	🔴			🔴	●	🔴	●					🔴		●				E, F	2
Be more proactive and engaged in the process to develop new drinking water quality regulations								●													A, B, D, E, G, J	2
Recycled Water Quality Degradation																						
Maintain compliance with recycled water and dilution requirements pursuant to the Chino Basin groundwater recharge permit		●					●	●	🔴	🔴				🔴	🔴						A, B, D, E, G, J	2
Increased Cost of Basin Plan Compliance																						
Develop management strategy to ensure sufficient supplies to blend with recycled water and comply with Salt and Nutrient Management Plan	●	●									🔴				●		●				G, K	2
Perform the minimum amount of monitoring/reporting that is required for basin management and regulatory compliance	●			●			●	●													L	3, 4

Appendix C

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Issues, Needs and Wants of the Chino Basin Stakeholders

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Reduced Recycled Water Availability and Increased Cost																						
Fully utilize IEUA recycled water resources		🔴		●			●	●		🔴					●						A, D, E, F, G	1
Maximize the use of recycled water for direct use or recharge	●	🔴		🔴			●	🔴	🔴	🔴					●						A, D, E, F, G	1
Evaluate the potential for direct potable reuse of recycled water	●								●						●						D, E, F	1
Develop alternative management strategies to comply with the recycled water discharge obligations to the Santa Ana River	●	●		●			●	●		●					●		●				D, E, F	1, 3
Utilize non-IEUA sources of recycled water that are not being put to beneficial use	🔴	●					●	●	🔴	🔴					●		●				D, E, F	1
Other																						
Coordinate timing of agreements, grants, etc. to ensure implementation of the OBMP Update	●							●	🔴	●					●	●	●				F, G, H, I, J	
Improve communication between the Parties	🔴			🔴				●						🔴	●		●				F, H, I	
Educate elected officials and decision makers on the need and urgency to address the water management challenges	●	🔴							🔴						●	●	●				F, G, H, I, J	
Consider a long-term planning horizon of up to 50 years	●								●	●					●						F, G, H, I, J	3

Appendix C

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Reduced Imported Water Availability and Increased Cost																						
Ensure that there is a reliable local water supply to replace imported water during shut down of imported water delivery infrastructure for maintenance and longer-term emergency outages	🔴	●	●	🔴			●	🔴	●	●					🔴	🔴	🔴	🔴			B, C, G	1, 3
Identify and utilize new sources of supplemental water	🔴	●		●			🔴	●	●	●					●	●	●				A, B	1, 3
Construct inter-basin and intra-basin connections for the benefit of regional water supply and conjunctive use	●	●		🔴			●	●	🔴			🔴			●	🔴	●	🔴			C, G	1, 3
Understand how imported water reliability from Metropolitan Water District will be affected with and without the California Water Fix	●							●	🔴						●	●	●				-	1, 3
Develop management strategies that ensure Parties will meet future Chino Basin Desalter Replenishment Obligation and have the money to fund it	●	●		🔴			🔴		●								●			🔴	H, I, J	3
Increase water-supply reliability at the lowest possible cost	🔴			●			●	●				🔴		🔴	●		●				A, B, D, J	3
Need a better understanding of the water management plans of the Parties to be able to better plan for imported water needs and to assure reliability of Metropolitan Water District water supply	●			●					🔴			🔴			●	●	●	🔴			A	3
Analyze water management scenarios that plan for unexpected challenges and emergencies	●							●	🔴	●					●	●	●				E, G	3
Ensure that sufficient supplemental water supplies will be available to meet future replenishment requirements							●		🔴	●		🔴			●					🔴	A	1, 3
Despite the best efforts of the Parties to decrease reliance on imported water, the cost of the total water supply continues to increase	●																				-	3
Use more recycled water for Replenishment Obligation	●			🔴			🔴		🔴								●				A, D, E, F	3
Continue to build collaborative programs between the Metropolitan Water District and Chino Basin	🔴						●	●	●						●		●	●			B, I	3

Appendix C

Table 2
Activities for Consideration in the 2020 OBMP Update

ID	Activity
A	Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge
B	Develop, implement, and optimize Storage-and-Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality.
C	Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence.
D	Maximize the reuse of recycled water produced by IEUA and others
E	Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses
F	Develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits in managing water quality
G	Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure.
H	Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements
I	Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement
J	Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update
K	Develop management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge
L	Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance

Appendix C

Table 3
OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
			Reductions in Chino Basin Safe Yield	Inability to Pump Groundwater with Existing Infrastructure	Increased Cost of Groundwater Use	Chino Basin Water Quality Degradation	Recycled Water Quality Degradation	Increased Cost of Basin Plan Compliance	Reduced Recycled Water Availability and Increased Cost	Reduced Imported Water Availability and Increased Cost
Goal 1 - Enhance Basin Water Supplies										
1a • Not all of the stormwater runoff available to the Chino Basin is diverted and recharged; failure to divert and recharge stormwater is a permanently lost opportunity. • The existing methodology to select recharge projects for implementation is based on the cost of imported water. There are currently no known projects with a unit cost lower than the cost of imported water, hindering expansion of stormwater capture and recharge • Pumping capacity in some areas of the basin is limited due to low groundwater levels, land subsidence, and water quality	A Construct new facilities and improve existing facilities to increase the capacity to store and recharge storm and supplemental water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge	• Increases recharge of high-quality stormwater that will: • protect/enhance the Safe Yield, • improve water quality, • reduce dependence on imported water, • increase pumping capacity in areas of low groundwater levels and areas of subsidence concern, and • provide new supply of blending water to support the recycled-water recharge program. • Provides additional supplemental-water recharge capacity for replenishment and implementation of Storage and Recovery Programs. • Provides additional surface water storage capacity. • Revised economic criteria for selecting recharge projects for implementation.	✓	✓	✓	✓	✓	✓		✓

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Goal 1 - Enhance Basin Water Supplies										
1b • There is a surplus of recycled water potentially available to the Chino Basin Parties that is not being put to beneficial use. • Existing infrastructure limits the expansion or reuse and recharge of recycled water in the Chino Basin. • Existing requirements to discharge recycled water to the Santa Ana River limit the amount of IEUA recycled water available for reuse and recharge •The Department of Drinking Water and the Regional Board blending requirements for recycled water recharge could limit expanded recharge opportunities	D Maximize the reuse of recycled water produced by IEUA and others	• Results in a new, consistent volume of in-lieu and/or wet water recharge that will: • protect/enhance the Safe Yield, • reduce dependence on imported water, • improve water-supply reliability, especially during dry periods, and • increase pumping capacity in areas of low groundwater levels and areas of subsidence concern. • Identify additional sources of water to satisfy IEUA discharge requirements pursuant to the Santa Ana River Judgment.	✓	✓					✓	✓

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Goal 2 - Protect and Enhance Water Quality										
2a • Areas of the basin are contaminated with VOCs, nitrate, perchlorate and other contaminants of emerging concern (CECs). • Water-quality regulations are evolving and becoming more restrictive, which limits the beneficial uses of groundwater. • Groundwater treatment may be necessary to meet beneficial uses, but can be expensive to build and operate. • The basin is hydrologically closed, which causes accumulation and concentration of salts, nutrients, and other contaminants. • Some stored water in the Chino Basin cannot be used due to water quality and insufficient treatment capacity • Recharge sources may contribute CECs to the groundwater basin	E Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses F Develop strategic regulatory-compliance solutions to comply with new and evolving drinking water standards that achieve multiple benefits in managing water quality	• Proactively addresses new and near-future drinking water regulations. • Enables the Parties to make informed decisions on infrastructure improvements for water-quality management and regulatory compliance. • Removes groundwater contaminants from the Chino Basin and thereby improves groundwater quality. • Enables the Parties to produce or leverage their water rights that may be constrained by water quality. • Ensures that groundwater is pumped and thereby protects/enhances the Safe Yield.	✓	✓	✓	✓				✓
2b • Water-quality regulations are evolving and generally becoming more stringent, which could limit the reuse and recharge of recycled water.	K Develop management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge	• Enables the continued and expanded recharge of recycled water, which will: • protect water quality, • improve water-supply reliability, especially during dry periods, and • protect/enhance the Safe Yield.	✓			✓	✓	✓		✓

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Goal 3 - Enhance Management of the Basin										
3a • Existing infrastructure (pumping and treatment capacity and conveyance) is insufficient to conduct puts and takes under proposed storage programs. • There is unused storage space in the Basin the use of which is constrained by the storage limits defined in existing CEQA documentation. • Watermaster's current storage management plan is not optimized to protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain Hydraulic Control, etc. • Storage and recovery operations could be limited by contaminant plumes or other CECs in groundwater	B Develop, implement, and optimize Storage and Recovery Programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality.	• Storage programs that protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain Hydraulic Control, etc. • New regional infrastructure to optimize put and take operations • Leverages unused storage space in the Basin. • Reduces reliance on imported water, especially during dry periods. • Potentially provides outside funding sources to implement the OBMP Update. • Improves water quality through the recharge of high quality water.	✓	✓	✓	✓				✓

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Goal 3 - Enhance Management of the Basin										
3b • Land subsidence in northwest MZ1 may limit the ability for Parties to pump their respective rights in this area. • Poor water quality and increasingly restricting water quality regulations limits the ability for some Parties to pump their respective rights. • Low groundwater levels impact pumping capacity	C Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence. G Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure.	• Enables producers in MZ1 and MZ2 to obtain water through regional conveyance, which supports management of groundwater levels to reduce the potential for subsidence and ground fissuring. • Enables the Parties to increase production in areas currently constrained by poor water quality. • Removes groundwater contaminants from the Chino Basin and thereby improves water quality. • Protects/enhances the Safe Yield. • Maximizes the use of existing infrastructure, which will minimize costs. • Provides infrastructure that can also be used to implement Storage and Recovery Programs.	✓	✓	✓	✓				✓
3c • Watermaster needs information to comply with regulations and its obligations under its agreements and Court orders, yet financial resources to collect this information are limited.	L Perform the appropriate amount of monitoring and reporting required to fulfill basin management and regulatory compliance	• Ensures full compliance with regulatory requirements. • Ensures full support of basin management initiatives. • Enables Parties to monitor the performance of the OBMP Update. • Continual review and revision of requirements and monitoring program to ensure cost efficiency	✓	✓	✓	✓	✓	✓	✓	✓

Appendix C

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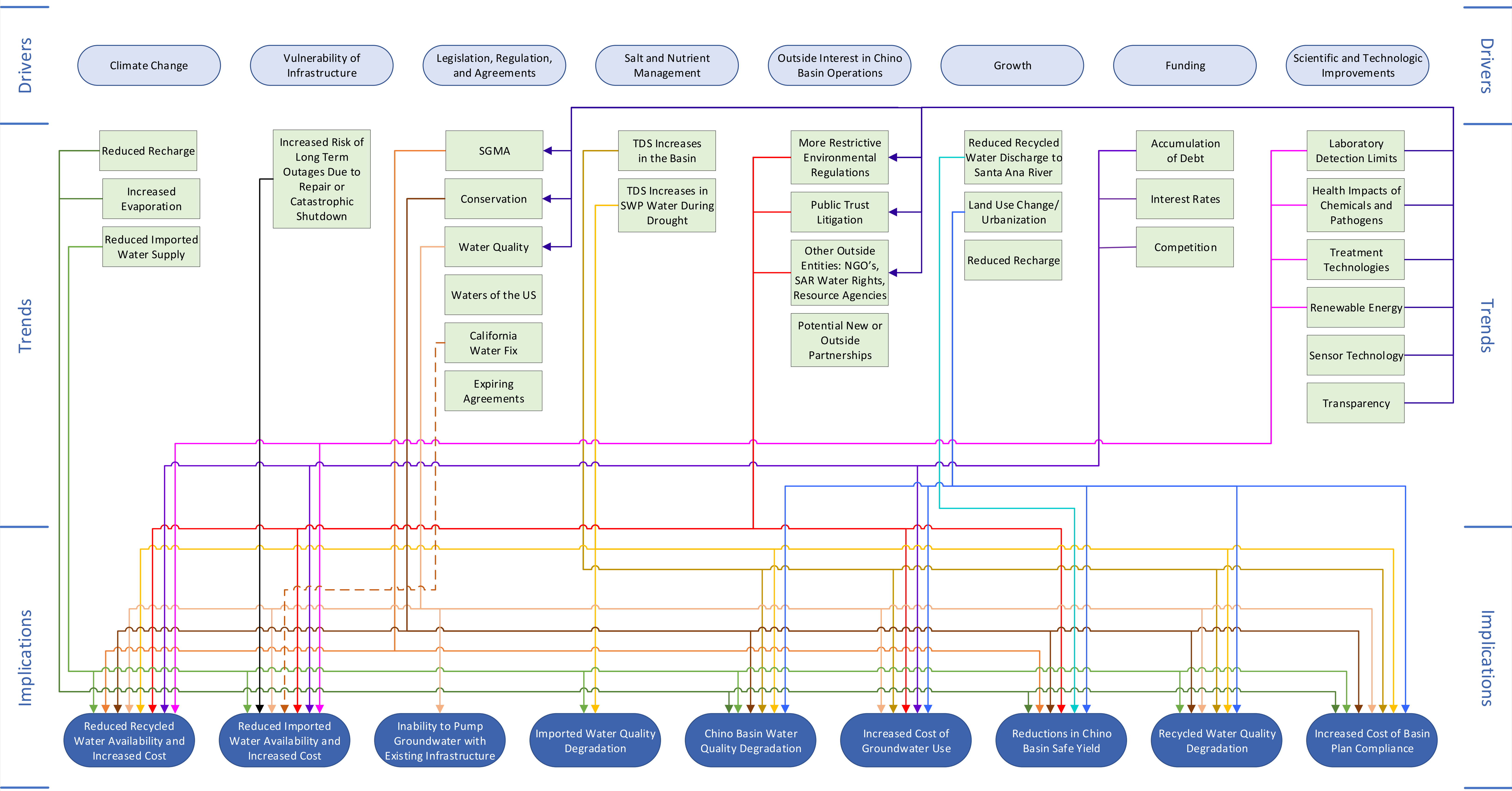
Goal 4 - Equitably Finance the OBMP												
4a	• The distribution of benefits associated with the OBMP Update is not defined. • Funding needed for the OBMP implementation activities of the Watermaster is not projected beyond the current year budget, which limits Parties ability to plan required funding for the future. • There is currently no formal process to evaluate and adapt the OBMP implementation plan, schedule and cost.	H	Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements	• Provides transparency as to the benefits of the OBMP Update activities • Identifies Watermaster roles and costs to the Parties • Formal process to revisit implementation plan and adjust priorities and schedule as necessary to address changed conditions • Periodic updates of cost projections for OBMP implementation needed to plan financial resources. • Improves readiness to apply for grants as they become available • Improves the likelihood that the OBMP will be implemented.			✓			✓	✓	✓
4b	• Limited financial resources constraint the implementation of the OBMP. • Future reliability of grant funding is uncertain	I	Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement	• Lowers the cost of OBMP implementation. • Improves the likelihood that the OBMP will be implemented.			✓			✓	✓	✓
		J	Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update				✓			✓	✓	✓

Appendix C

Figure 1 – Drivers and Trends and Their Implications
2020 OBMP Update



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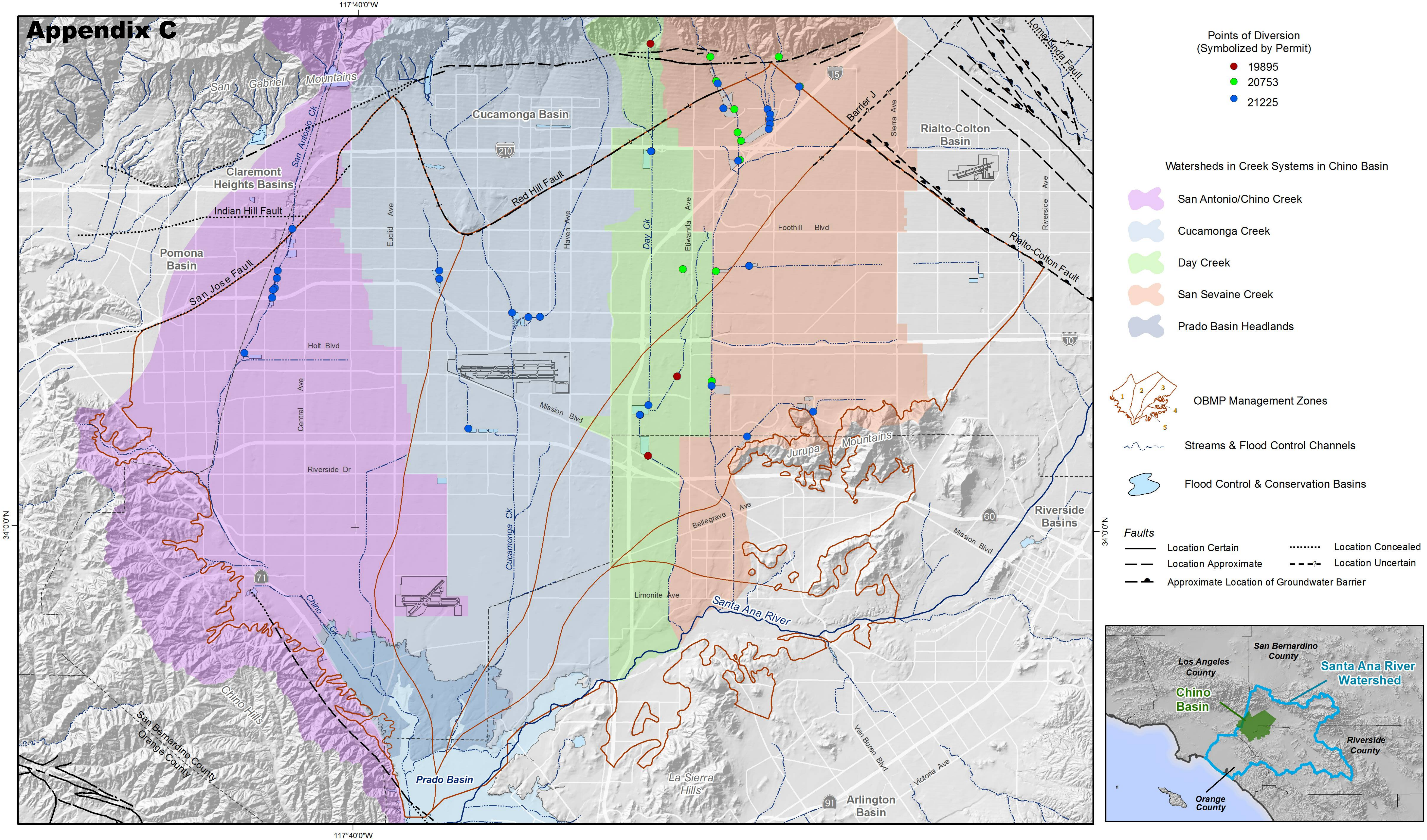


Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_A-1_PODs.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

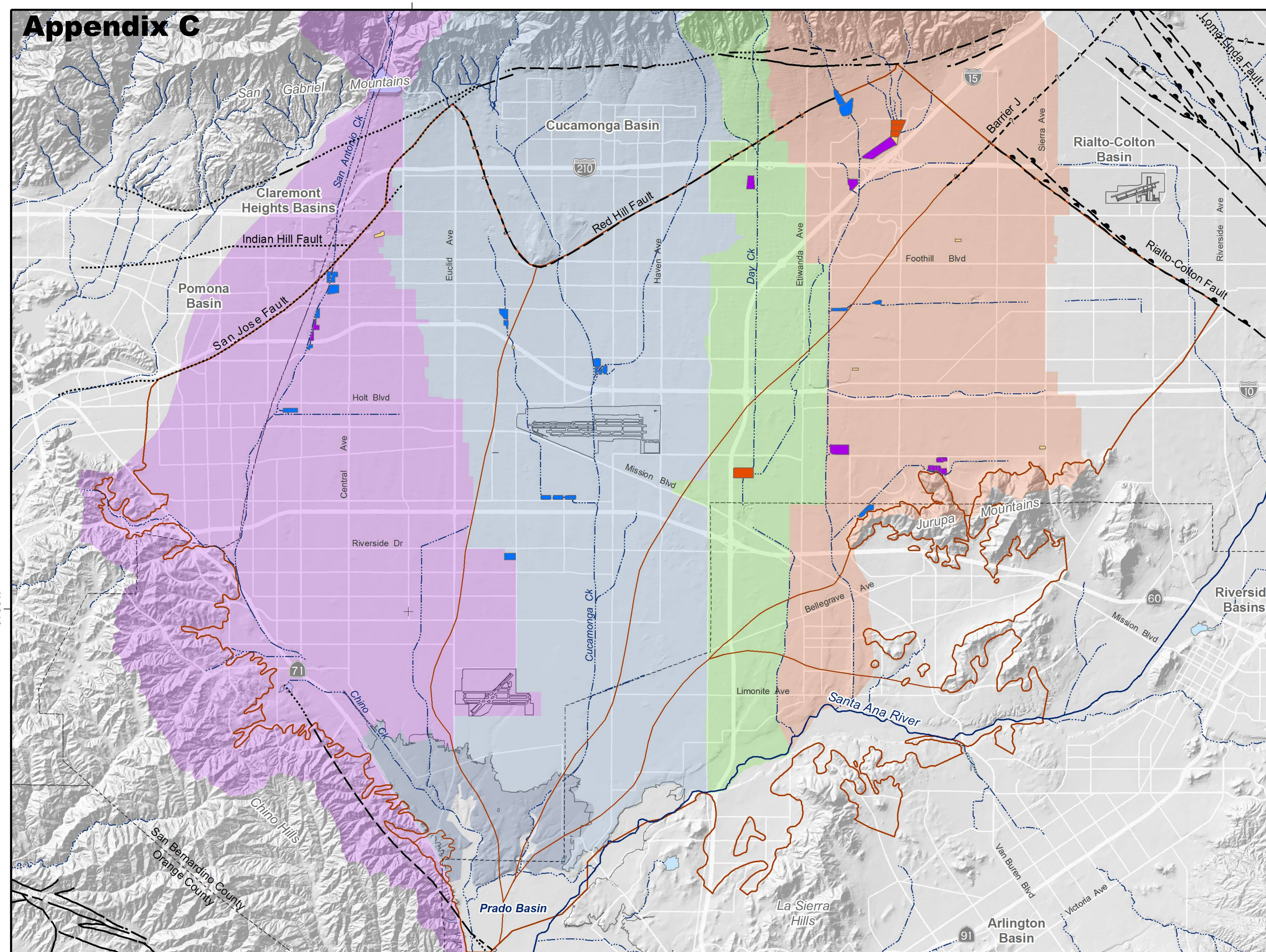
Prepared for:
OBMP 2020 Update
Scoping Report

Chino Basin Watermaster
Partners in Basin Management

Watermaster Points of Diversion
Permits 19895, 20753, 21225

Exhibit A-1

Appendix C



Watersheds in Creek Systems in Chino Basin

- San Antonio/Chino Creek
- Cucamonga Creek
- Day Creek
- San Sevaine Creek
- Prado Basin Headlands

Recharge Facilities in the Chino Basin and Associated Projects

- Projects in the 2002 Recharge Master Plan (2002 RMP)
- Projects in 2013 Amendment to the 2010 Recharge Master Plan Update (2013 RMPU)
- Projects in both 2002 RMP and 2013 RMPU
- Projects considered in 2013 RMPU and deferred to a future RMPU

OBMP Management Zones

Streams & Flood Control Channels

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_A-2_RMPUprojects.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
OBMP 2020 Update
Scoping Report

Recharge Improvements in the Chino Basin Since Implementation of the OBMP

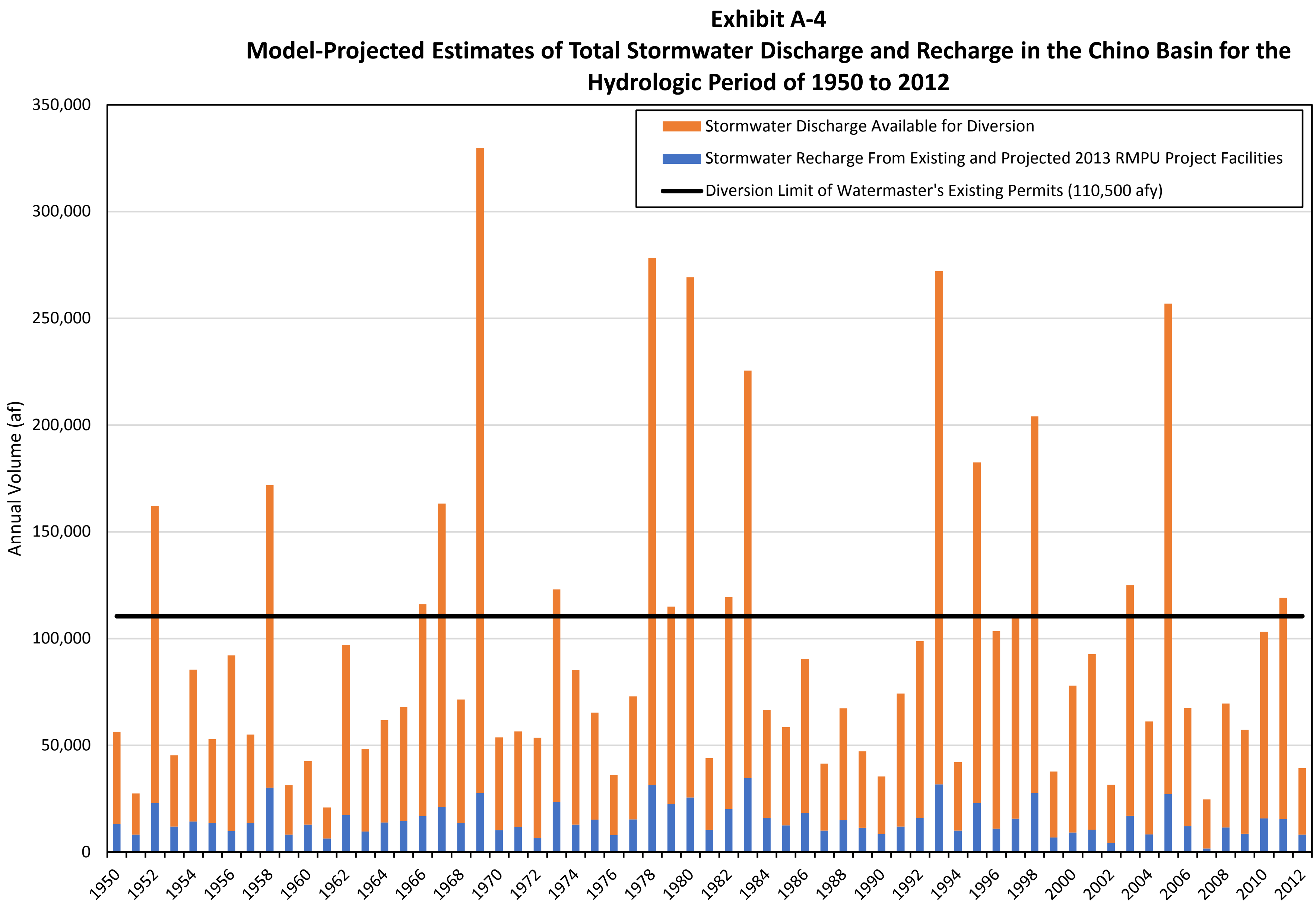
Exhibit A-2

Exhibit A-3
Average Stormwater Recharge and Supplemental Water Recharge Capacity Estimates

Recharge Facility	Average Stormwater Recharge FY 2004/05 through FY 2016/17 (afy)	Theoretical Maximum Supplemental Water Recharge Capacity (afy)	Theoretical Maximum Recharge Capacity (afy)
Brooks Street Basin	489	1,658	2,147
College Heights Basin - East	78	5,816	7,958
College Heights Basin - West		2,064	
Montclair Basin 1	953	409	5,617
Montclair Basin 2		2,940	
Montclair Basin 3		400	
Montclair Basin 4		915	
Eighth Street Basin	1,069	3,426	5,665
Seventh Street Basin		1,170	
Upland Basin	430	891	1,321
Subtotal Management Zone 1	*3,019*	*19,689*	*22,708*
Ely	1,120	4,501	5,621
Grove Basin	305	-	305
Etiwanda Debris Basin	212	2,908	3,120
Hickory Basin East	361	856	2,637
Hickory Basin West		1,420	
Lower Day Basin Cell 1	513	983	1,496
Lower Day Basin Cell 2			
Lower Day Basin Cell 3			
San Sevaine No. 1	816	114	6,025
San Sevaine No. 2		2,869	
San Sevaine No. 3		2,226	
Turner Basin No. 1	1,527	577	4,084
Turner Basin No. 2		227	
Turner Basin No. 3		418	
Turner Basin No. 4A		981	
Turner Basin No. 4B		164	
Turner Basin No. 4C		191	
Victoria Basin	309	2,279	2,588
Subtotal Management Zone 2	*5,163*	*20,713*	*25,876*
Banana Basin	258	1,790	2,048
Declez Basin Cell 1	582	1,235	3,409
Declez Basin Cell 2		823	
Declez Basin Cell 3		770	
IEUA RP3 Basin Cell 1	1,129	4,653	12,716
IEUA RP3 Basin Cell 3		3,266	
IEUA RP3 Basin Cell 4		3,669	
Subtotal Management Zone 3	*1,969*	*16,204*	*18,173*
Total	**10,151**	**56,606**	**66,757**

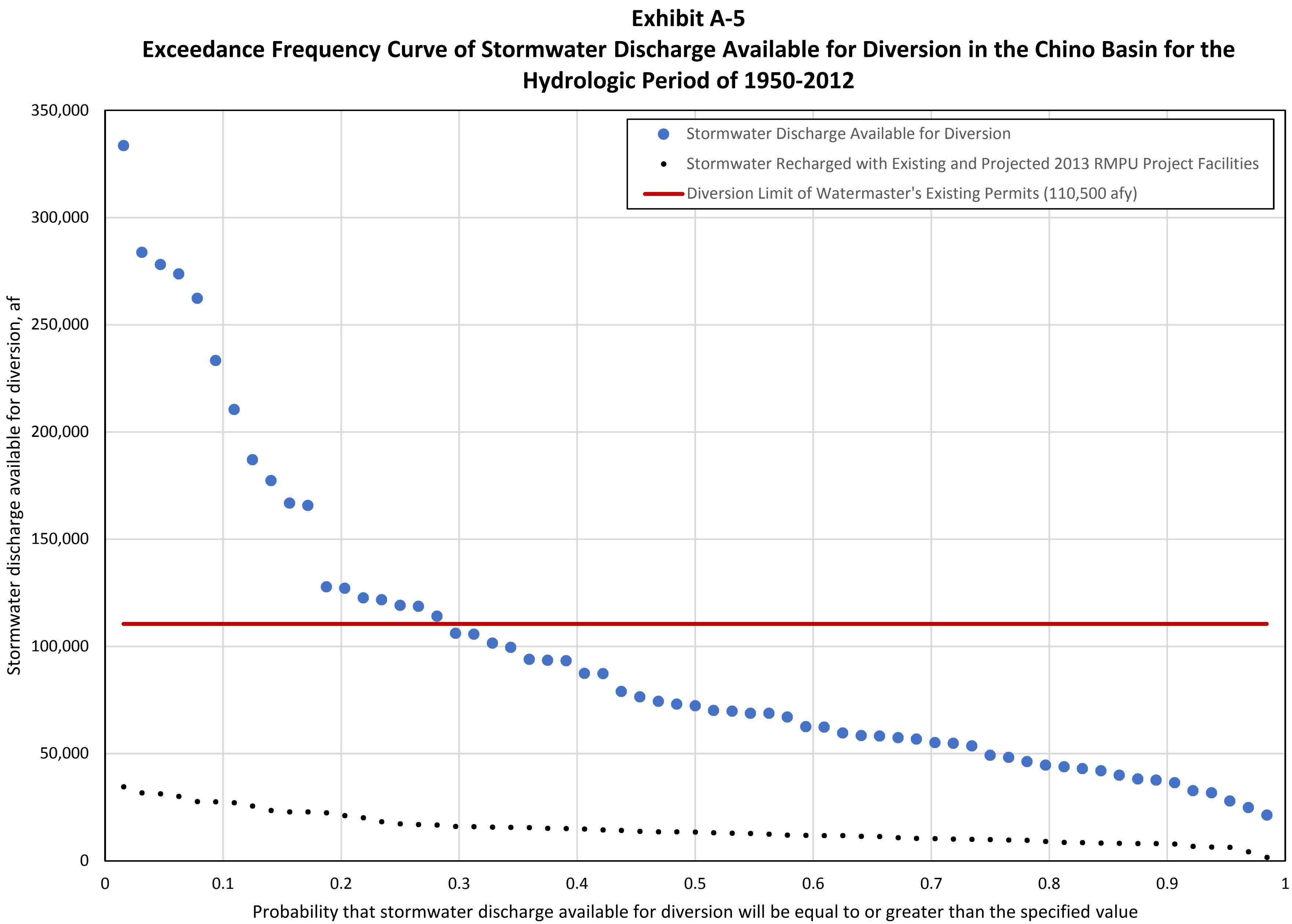
Source: 2018 Recharge Master Plan (WEI 2018)

Appendix C



Exhibit_A-4_A-5_Annual_Flow_Available--Figure_3-3
Created on 6/11/2019
Printed on 7/5/2019

Appendix C



Exhibit_A-4_A-5_Annual_Flow_Available--Figure_3-4
Created on 6/11/2019
Printed on 7/5/2019

Appendix C

Exhibit A-6

Projects Considered and Not Recommended Due to Cost in the 2013 RMPU and New Conceptual Recharge Projects Considered and Not Recommended in the 2018 RMPU[1]

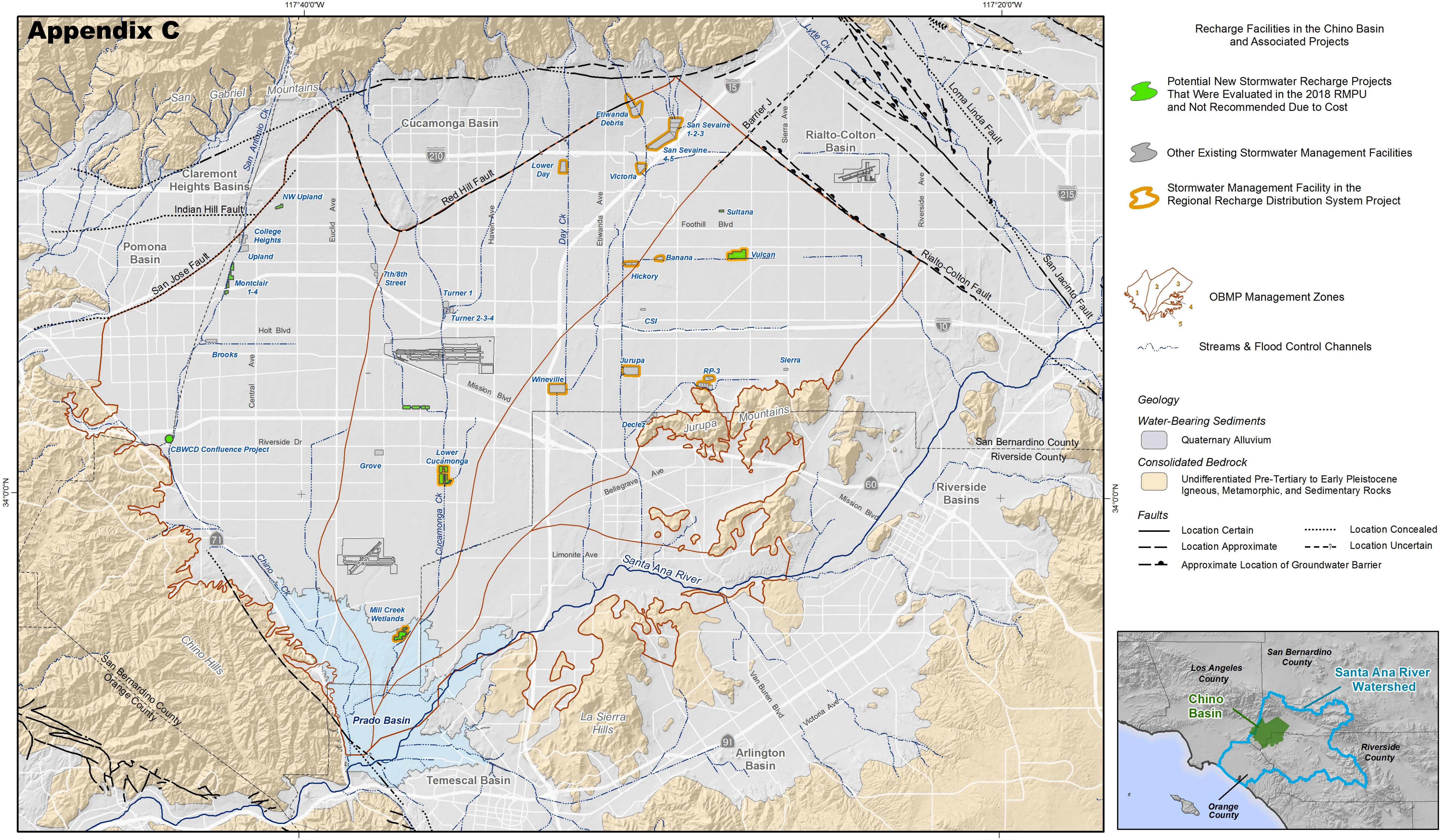
PID[2]	Project	Source	New Stormwater Recharge (afy)	Projected Costs in 2023	
				2018 RMPU Estimated Unit Stormwater Recharge Cost ($/af)	2018 RMPU Estimated Capital Cost
1a	Montclair Basins - Transfer water between Montclair Basins and deepen MC 4	2013 RMPU	71	$5,980	$6,526,000
5	North West Upland Basin - Increase drainage area and basin enlargement	2013 RMPU	93	$4,620	$6,574,000
15	Ely Basin - Basin enlargement and increased drainage area	2013 RMPU	101	$1,990	$3,017,000
24	Vulcan Basin - Construct new inflow and outflow structures	2013 RMPU	857	$2,560	$33 million
26	Sultana Avenue - Deepen basin by 10 feet	2013 RMPU	7	$5,620	$601,000
n/a	Regional Recharge Distribution System	2013 RMPU	5,000	$2,810	$184 million
n/a	Vineyard Managed Aquifer Recharge	2018 RMPU	n/a	n/a	n/a
n/a	CBWCD Confluence Project[3]	2018 RMPU	n/a	n/a	n/a

[1] With the exception of the last two projects listed, projects in this table were included in the 2013 RMPU and were considered in the 2018 RMPU based on the following criteria: projected yield is greater than zero (excluding projects for which yield was not quantified); project was not already implemented; project was determined to be technically and institutionally feasible; project was not recommended for final implementation in the 2013 RMPU

[2] 2013 Project Identification (PID) number; n/a - No PID assigned.

[3] Per an email from Steve Sentes at CBWCD dated August 16, 2018, the potential new stormwater recharge for the Confluence Project is 2,940 afy at a cost of about $17 million (excluding land acquisition costs). The estimated unit stormwater recharge cost is $650/af. This information was not vetted through the CBWM Steering Committee process during the development of the 2018 RMPU.

Appendix C



Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: CS
Date: 11/22/2019
File: Exhibit_A-7_Potential new facilities.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

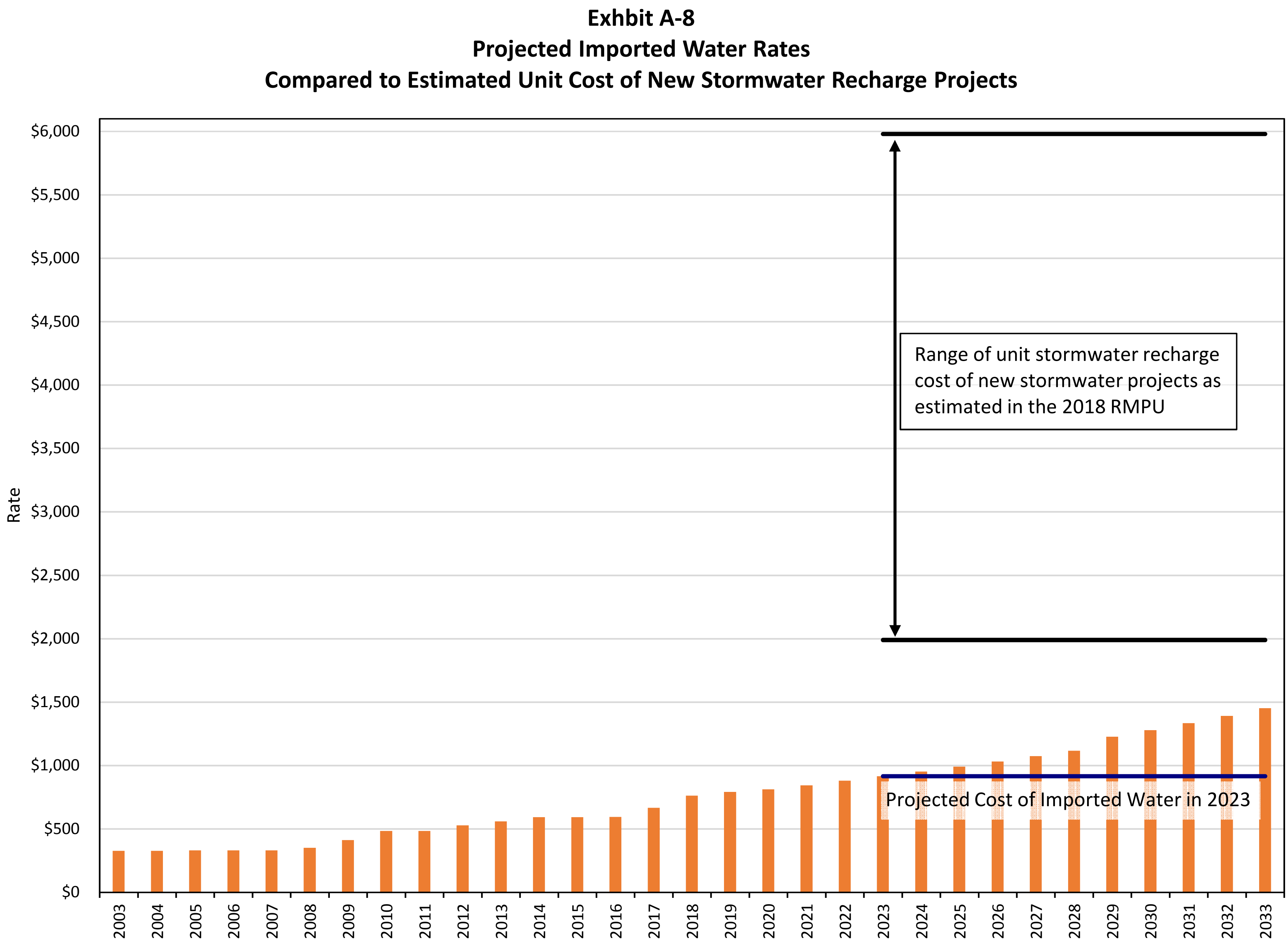
Prepared for:

OBMP 2020 Update
Scoping Report

Potential New Stormwater Recharge Projects Considered in the 2018 RMPU

Exhibit A-7

Appendix C



Exhibit_A-8_IW_Costs--Exhibit A-8
Created on 3/15/2019
Printed on 7/5/2019

Appendix C

Exhibit A-9
Cost-Estimate and Schedule to Implement Activity A

Task and Subtask Description	Engineering Cost	FY 2020/21				FY 2021/22				FY 2022/23				FY 2023/24 and beyond
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Task 1 Define objectives and refine scope of work · Define objectives of Activity A · Refine scope described in TM1 · Refine detailed cost and schedule	$45,000	$45,000												
Task 2 Develop planning, screening, and evaluation criteria · Develop criteria on how and where to conduct recharge · Develop criteria to evaluate project cost and benefit · Review and finalize criteria	$125,000		$125,000											
Task 3 Describe recharge enhancement opportunities · Identify potential stormwater recharge projects · Select projects for reconnaissance level recharge study	$80,000					$80,000								
Task 4 Develop reconnaissance-level engineering design and operating plan · Characterize potential recharge alternatives · Rank Alternatives · Prepare finance plan for soft-costs · Prepare report	$325,000						$220,000			$105,000				
Task 5 Plan, design, and construct selected recharge projects · Prepare preliminary design report and CEQA documentation · Prepare finance plan for project implementation · Obtain permits and agreements and prepare final design · Construct selected projects	$ TBD													$ TBD
Total Cost and Cost by FY	**$575,000**	**$170,000**				**$300,000**				**$105,000**				**$ TBD**

TBD -- To be determined

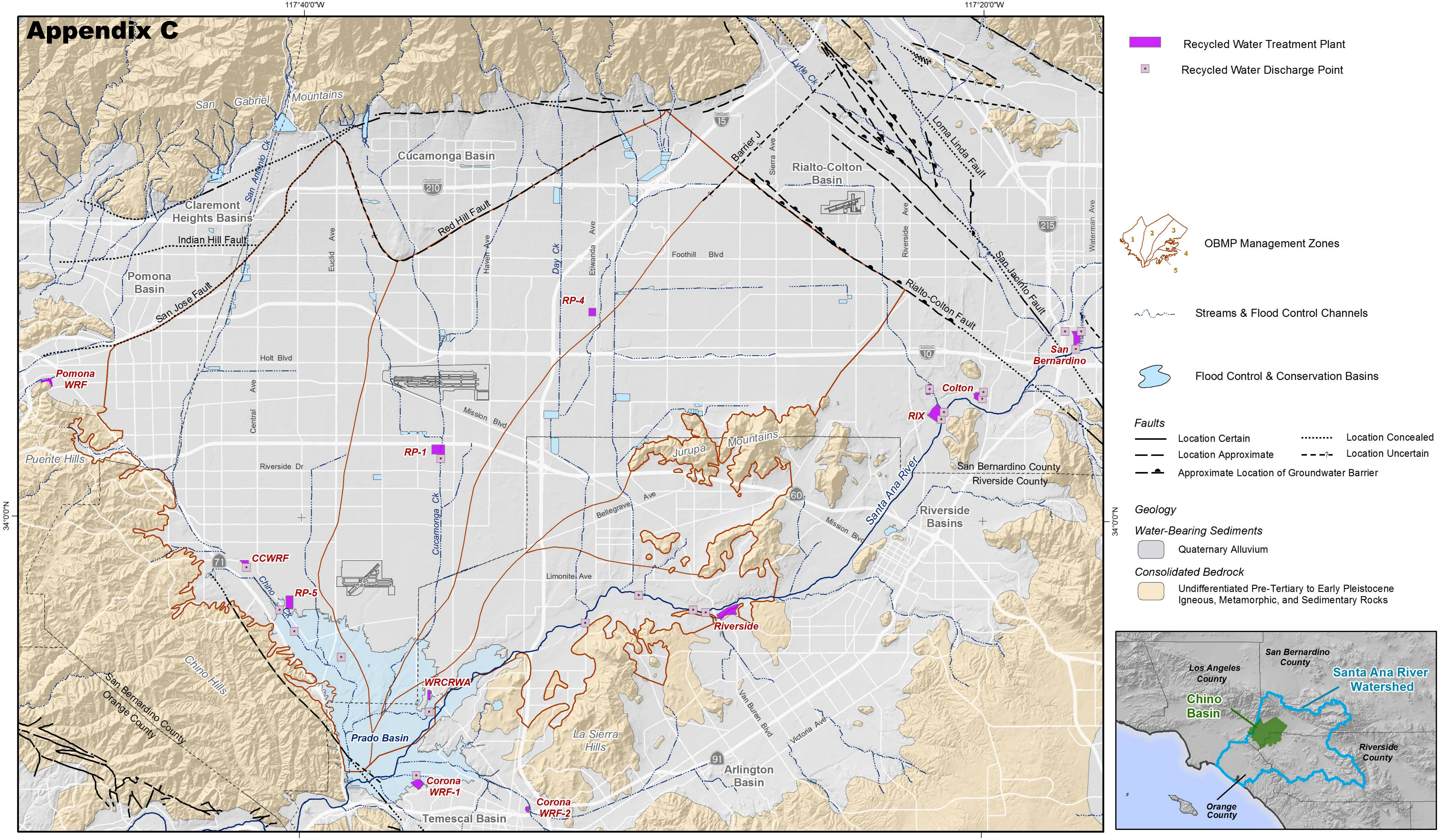
Appendix C

Exhibit B-1
Cost-Estimate and Schedule to Implement Activity B

Task and Subtask Description	Engineering Cost	FY 2020/21				FY 2021/22				FY 2022/23				FY 2023/24 and beyond
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Task 1 Convene the Storage and Recovery Program Committee, define objectives, and refine scope of work · Convene Storage and Recovery Program Committee · Define objectives and impediments for developing Storage and Recovery Programs · Define mutual benefits expected from Storage and Recovery Programs · Develop scope, schedule, and cost to prepare a *Storage and Recovery Program Master Plan*	$105,000	$105,000												
Task 2 Develop conceptual alternatives for Storage and Recovery Programs at various scales · Identify and characterize potential source waters · Identify potential storing partners and delivery methods · Identify and characterize institutional challenges · Develop planning criteria · Describe several conceptual Storage and Recovery Programs alternatives · Evaluate and select alternatives for Task 3	$ TBD					$ TBD								
Task 3 Describe and evaluate reconnaissance-level facility plans and costs for Storage and Recovery Program alternatives · Describe alternative facility plans, operations, and costs · Characterize basin response, potential MPI, benefits · Describe potential implementation barriers · Assess feasibility and rank alternatives	$ TBD									$ TBD				
Task 4 Prepare *Storage and Recovery Program Master Plan* · Describe results and recommendations of Tasks 1 through 3 · Achieve consensus on the recommendations · Prepare *Storage and Recovery Program Master Plan*	$ TBD												$ TBD	$ TBD
Total Cost and Cost by FY	**$105,000**	**$105,000**				**$ TBD**				**$ TBD**				**$ TBD**

TBD -- To be determined

Appendix C



Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: SO
Date: 11/22/2019
File: Exhibit D-1_RW Treatment Plants.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
OBMP 2020 Update
Scoping Report

CHINO BASIN WATERMASTER
Partners in Basin Management

Recycled Water Treatment Plants and Discharge Points

Exhibit D-1

Appendix C

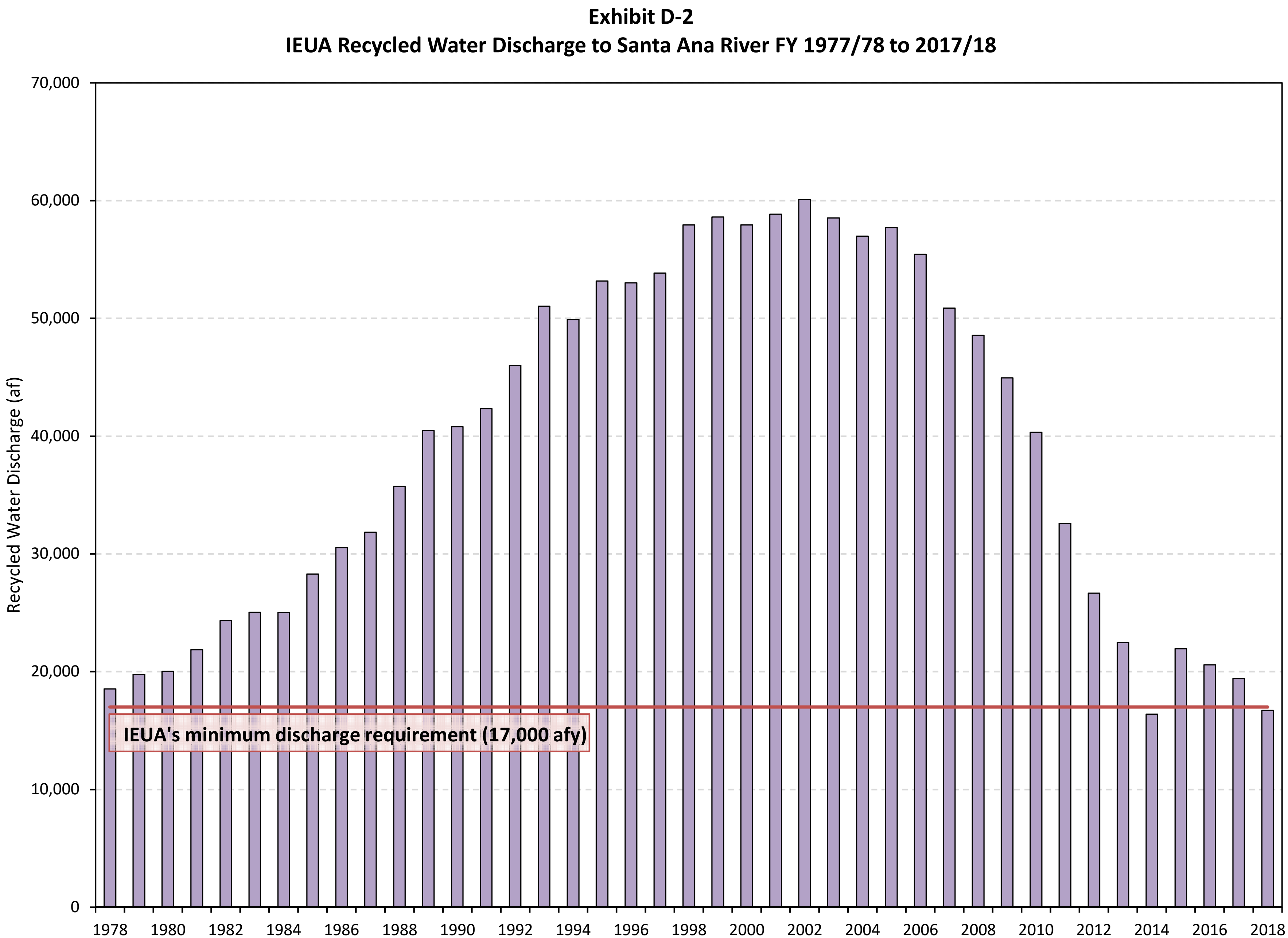
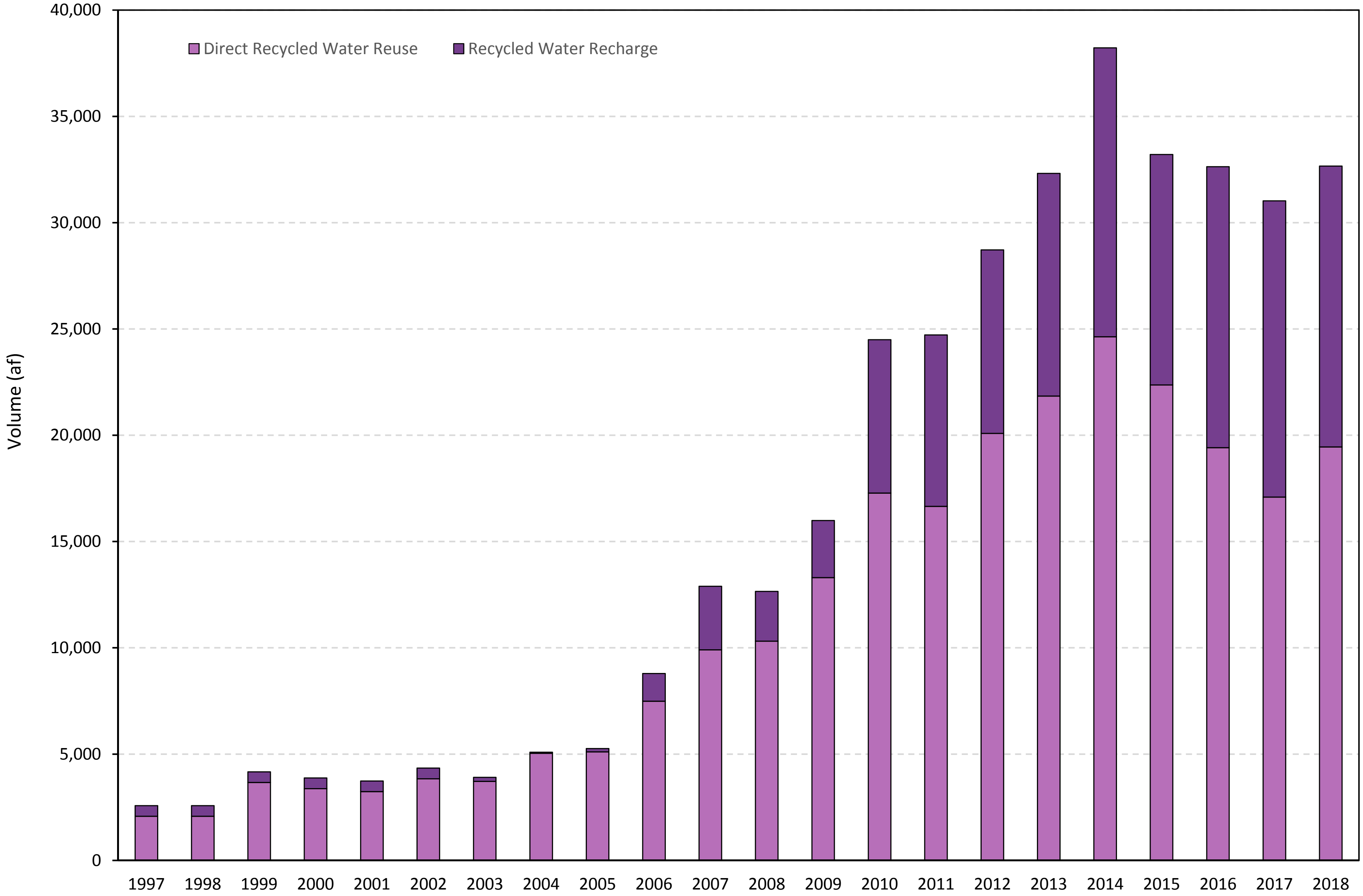


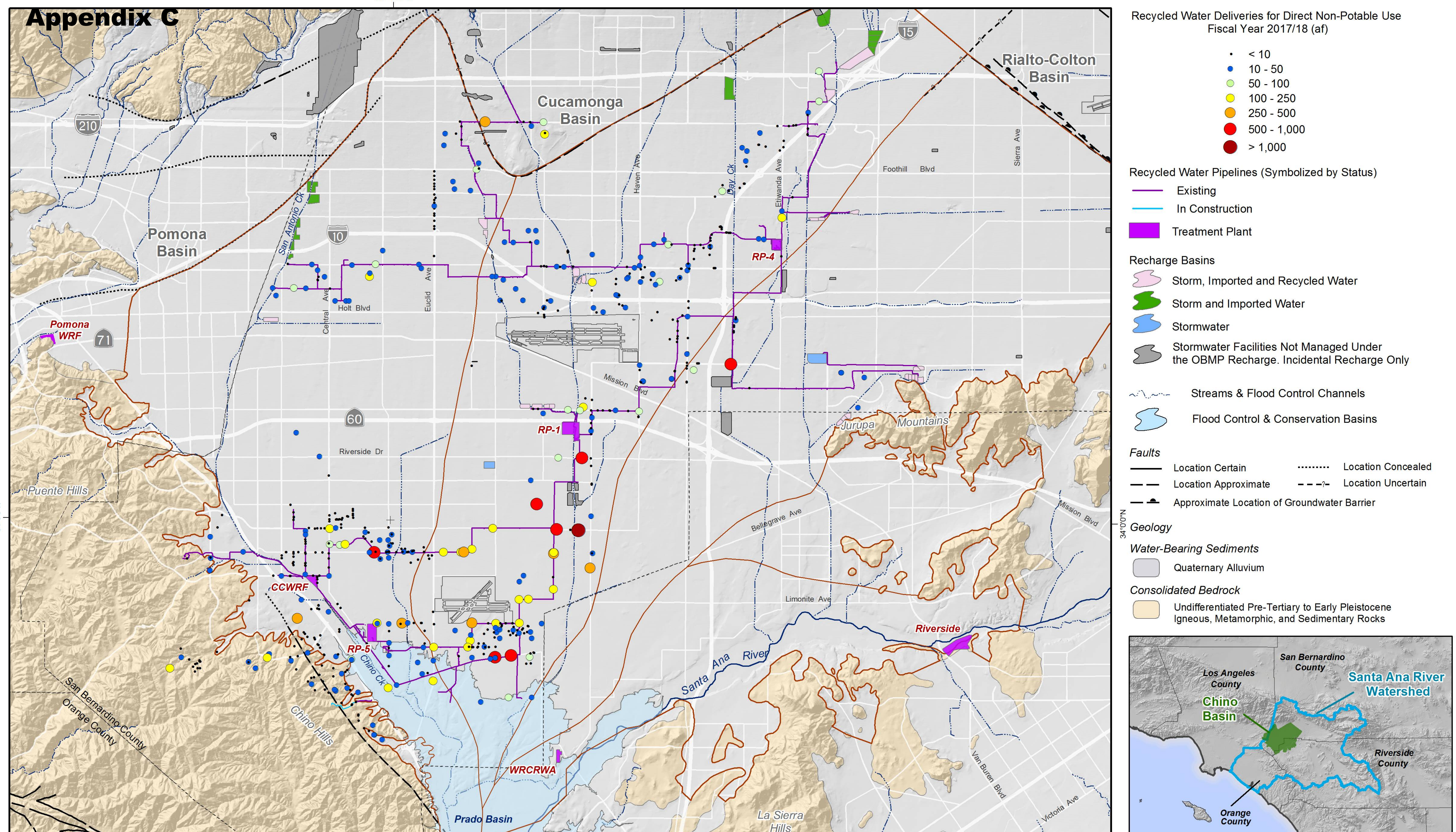
Exhibit D-2
IEUA Recycled Water Discharge to Santa Ana River FY 1977/78 to 2017/18
Recycled Water Discharge (af)
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
IEUA's minimum discharge requirement (17,000 afy)

Appendix C

Exhibit D-3
Recycled Water Recharge and Direct Recycled Water Reuse FY 1996/97 to 2017/18



Appendix C



117°40'0"W

Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: CS
Date: 20170215
File: Exhibit D-4_RW Deliveries

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:
OBMP 2020 Update
Scoping Report

CHINO BASIN WATERMASTER
Partners in Basin Management

IEUA Recycled Water Delivery System for Direct Reuse
FY 2017/18

Exhibit D-4

Appendix C

Exhibit D-5
IEUA Projections of Recycled Water Production and Reuse through 2040

Recycled Water (af)		FY 2017/18 (Actual)	2020	2025	2030	2040
Production - High*	a	49,369	64,400	70,400	75,200	83,000
Production - Low*			54,400	61,000	67,700	74,700
Direct Reuse*	b	19,450	24,000	27,500	30,000	30,000
Recharge*	c	13,212	16,900	18,700	18,700	18,700
Surplus Supply Available for Reuse and/or Discharge - High	d = a - (b + c)	16,708	23,500	24,200	26,500	34,300
Surplus Supply Available for Reuse and/or Discharge - Low			13,500	14,800	19,000	26,000

* Source: Inland Empire Utilities Agency. *Sources of Water Supply for the Chino Basin Program* . Memo to Member Agencies. February 20, 2019.

Appendix C

Exhibit D-6

Actual and Projected[1] Annual Recycled Water Recharge

(afy)

Basin Permitted for Recycled Water Recharge	Theoretical Maximum Supplemental Water Recharge Capacity[2]		Actual FY 2017/18 Recharge	Projected Annual Recharge for FY 2019/20 to FY 2029/30
	Directly After Cleaning[3]	Average Between Maintenance Periods[4]		
Brooks Street Basin	2,825	1,658	1,268	2,000 [5]
Seventh and Eighth Street Basins	5,045	4,596	1,037	1,490
Subtotal Management Zone 1			*2,305*	*3,490*
Ely Basins	7,375	4,501	1,511	1,100
Hickory Basin	2,433	2,276	1,399	1,650
San Sevaine Basins 1-5	9,637	5,209	0	840
Turner Basins 1-4	3,674	2,557	1,526	1,110
Victoria Basin	2,436	2,279	793	1,530
Subtotal Management Zone 2			*5,228*	*6,230*
Banana Basin	1,913	1,790	2,131	1,050
Declez Basin	3,032	2,827	588	1,250
IEUA RP3 Ponds	12,389	11,587	2,960	4,400
Subtotal Management Zone 3			*5,679*	*6,700*
Total	**50,760**	**39,280**	**13,212**	**16,420**

n/a - not applicable

[1] Source - Andy Campbell, IEUA, June 2016

[2] Subject to Watermaster needs for recharge and replenishment

[3] Total recharge from the 10-month period directly after a cleaning.

[4] Average annual recharge over the span between maintenance. The average cleaning frequency of each recharge facility was provided by the IEUA. This estimate corresponds to continuous use between maintenance periods and is less than the recharge capacity that would occur if the recharge basins are used less frequently.

[5] The projected recharge at Brooks Basin is larger than the theoretical maximum average supplemental water recharge capacity between maintenance periods, but the capacity can increase up to 2,825 afy if the maintenance frequency is increased.

Appendix C

Exhibit D-7
Cost-Estimate and Schedule to Implement Activity D

Task and Subtask Description	Engineering Cost	FY 2020/21				FY 2021/22				FY 2022/23				FY 2023/24 and beyond
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Task 1 Convene Recycled Water Projects Committee, define objectives and refine scope of work · Convene Recycled Water Projects Committee · Define objectives of Activity D · Refine scope described in TM1 · Refine detailed cost and schedule	$50,000	$50,000												
Task 2 Characterize the availability of all recycled water supplies and demands · Review 2020 Urban Water Management Plans · Develop water supply and demand projections · Characterize timing and magnitude of recycled water available	$135,000		$135,000											
Task 3 Develop planning, screening, and evaluation criteria · Develop Watermaster criteria · Develop regulatory criteria · Develop criteria to evaluate project cost and benefit · Review and finalize criteria	$40,000				$40,000									
Task 4 Describe recycled water reuse project opportunities · Identify potential recycled water reuse projects · Select projects for reconnaissance level recharge study	$85,000					$85,000								
Task 5 Develop reconnaissance-level engineering design and operating plan · Characterize potential project alternatives · Rank alternatives · Prepare finance plan for soft-costs · Prepare report	$310,000						$130,000			$180,000				
Task 6 Plan, design, and construct selected recycled water projects · Prepare preliminary design report and CEQA documentation · Prepare finance plan for project implementation · Obtain permits and agreements and prepare final design · Construct selected projects	$ TBD													$ TBD
Total Cost and Cost by FY	**$620,000**	**$225,000**				**$215,000**				**$180,000**				**$ TBD**

TBD -- To be determined

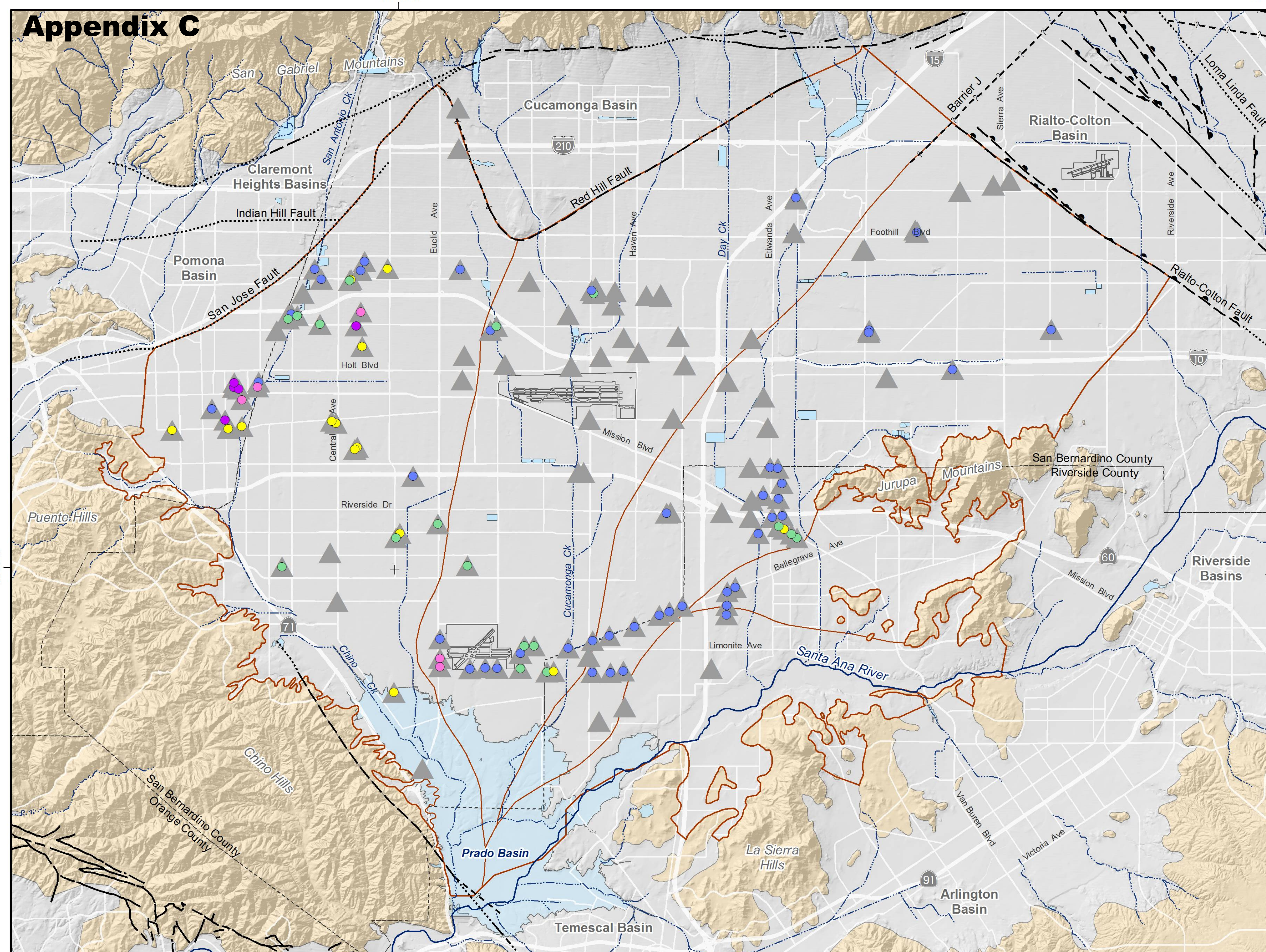
20190626_ActivityD_Cost.xlsx--Summary_TM1
Created on 6/10/2019
Printed on 7/23/2019

Appendix C

Exhibit EF-1
Summary of Drinking Water Contaminants with Primary MCLs in Municipal Supply Wells
FY 2013/14 - 2017/18

Analyte	Primary CA MCL	Number of Active Municipal Supply Wells with Exceedance of MCL	Number of Municipal Supply Wells with Exceedance of MCL	Number of Total Wells in the Chino Basin with Exceedance of MCL
Nitrate-Nitrogen	10 mgl	71	80	555
1,2,3-Trichloropropane	0.005 µgl	33	36	111
Perchlorate	6 µgl	27	30	387
Trichloroethylene (TCE)	5 µgl	11	14	269
Gross Alpha	15 pCi/L	6	7	14
Chromium	50 µgl	4	4	4
Arsenic	0.01 mgl	3	5	74
1,2-Dibromo-3-chloropropane	0.2 µgl	3	3	4
Tetrachloroethene (PCE)	5 µgl	3	3	96
Trihalomethanes	10 µgl	2	3	2
Nitrite-Nitrogen	1 mgl	2	2	17
1,1-Dichloroethene (1,1-DCE)	5 µgl	1	1	13
Dichloromethane (Freon 30)	5 µgl	1	1	91
Uranium	20 pCi/L	1	1	1

Appendix C



Active Municipal Supply Well

Number of Contaminants that Exceed a MCL

- 1
- 2
- 3
- 4
- 5

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

Location Certain

Location Concealed

Location Approximate

Location Uncertain

Approximate Location of Groundwater Barrier

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-2_Exceedance_Count.mxd

0 1 2 3 4 5 Miles

0 2 4 6 8 Km

Prepared for:

OBMP 2020 Update

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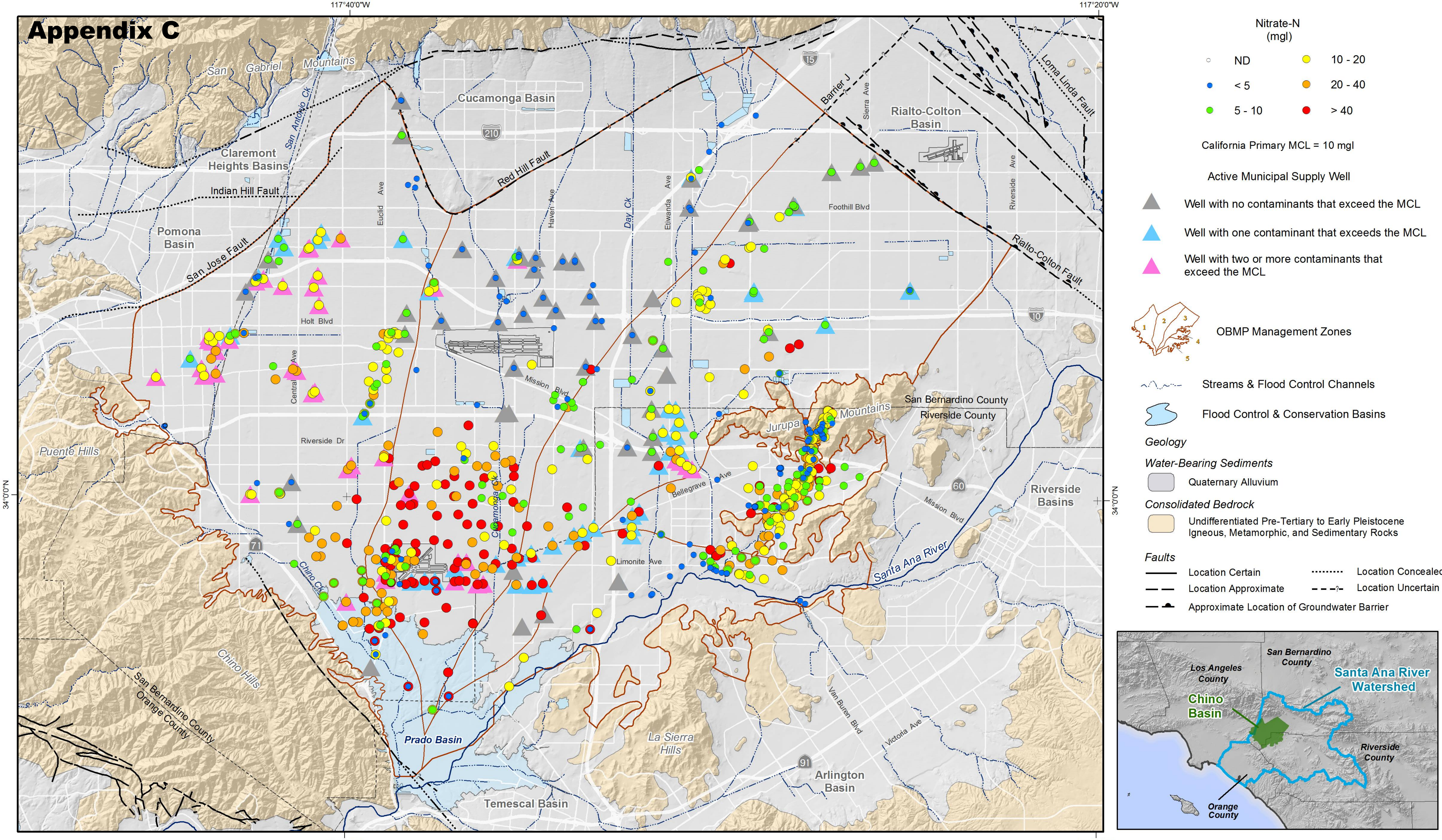
Occurrence of Drinking Water Contaminants in Active Municipal Supply Wells in Chino Basin

2014-2018

Exhibit EF-2

Appendix C



Prepared by:

WEI Wildermuth Environmental, Inc.

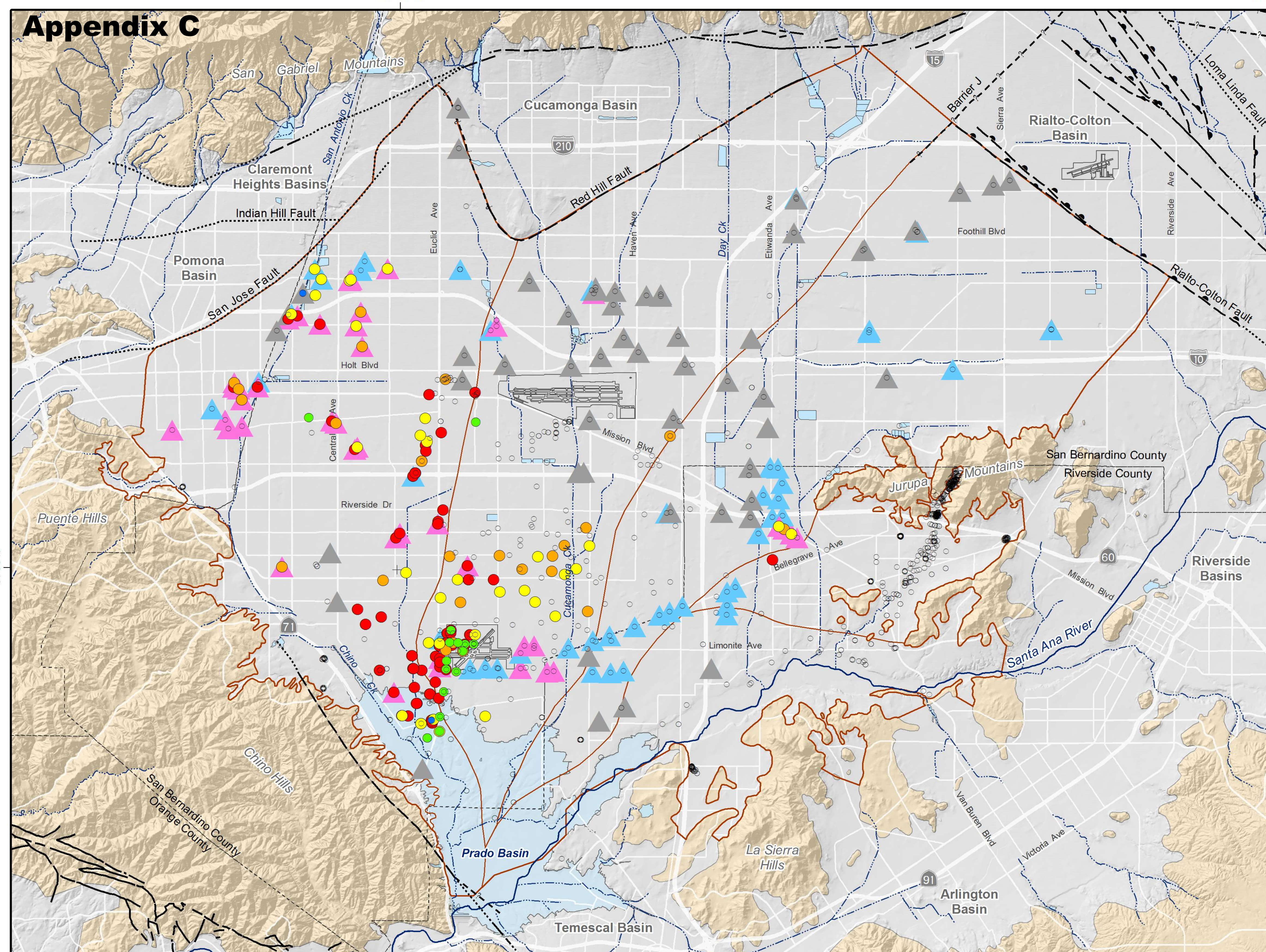
Author: CS
Date: 11/22/2019
File: Exhibit_EF-3_NO3_2014-2018.mxd

Prepared for:
OBMP 2020 Update
Scoping Report

Maximum Nitrate Concentration
2014-2018

Exhibit EF-3

Appendix C



1,2,3-TCP (µgl)

- ND
- < 0.0025
- 0.0025 - 0.005
- 0.005 - 0.01
- 0.01 - 0.02
- > 0.02

California Primary MCL = 0.005 µgl

Active Municipal Supply Well

- Well with no contaminants that exceed the MCL
- Well with one contaminant that exceeds the MCL
- Well with two or more contaminants that exceed the MCL

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-4_1,2,3-TCP_2014-2018.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

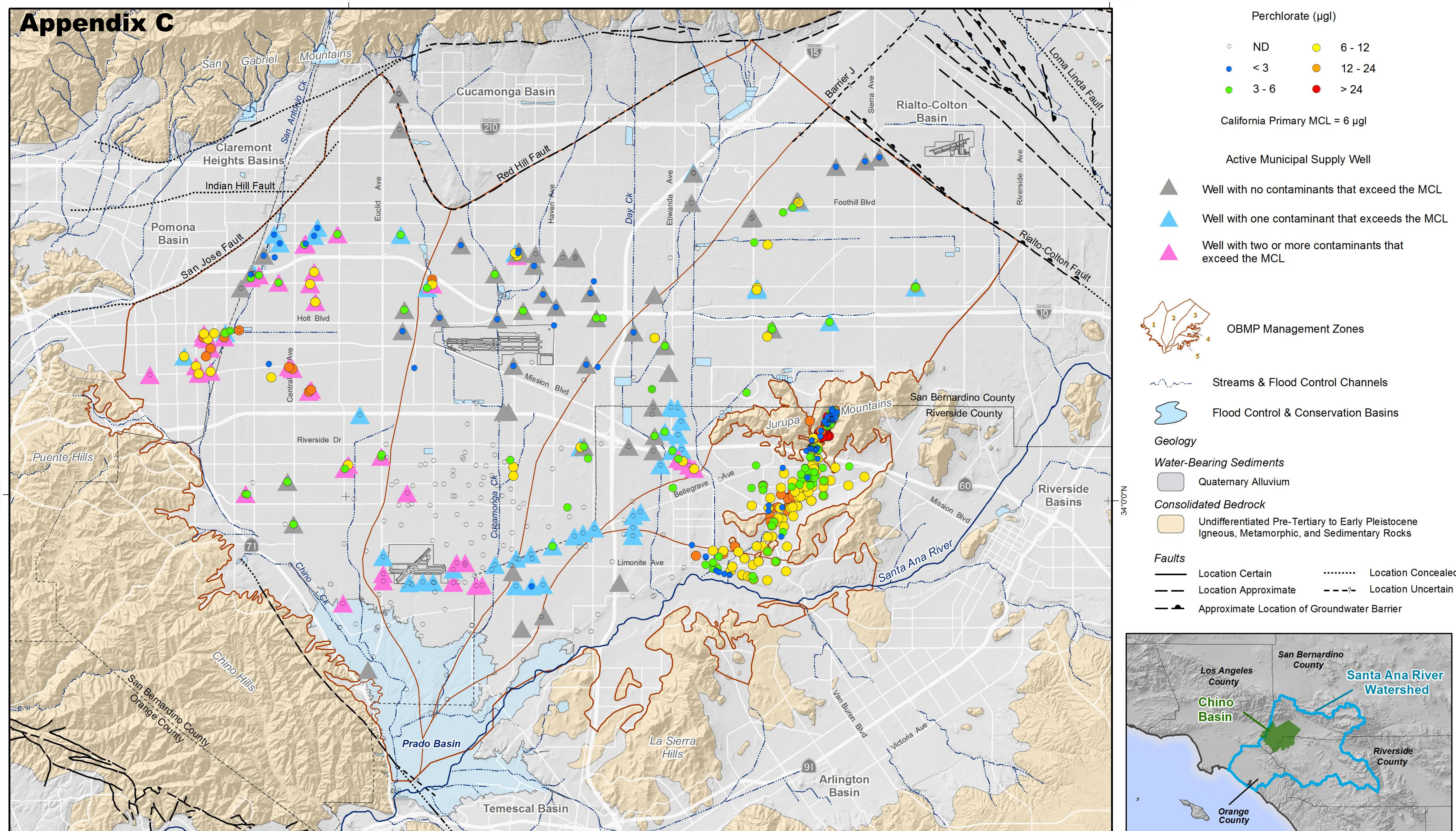
Prepared for:

OBMP 2020 Update
Scoping Report

Maximum 1,2,3-Trichloropropane (1,2,3-TCP) Concentration
2014-2018

Exhibit EF-4

Appendix C



Prepared by:

WEI Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-5_CLO4_MCL_2014-2018.mxd

Prepared for:

OBMP 2020 Update

Scoping Report

Maximum Perchlorate Concentration

2014-2018

Exhibit EF-5

Appendix C

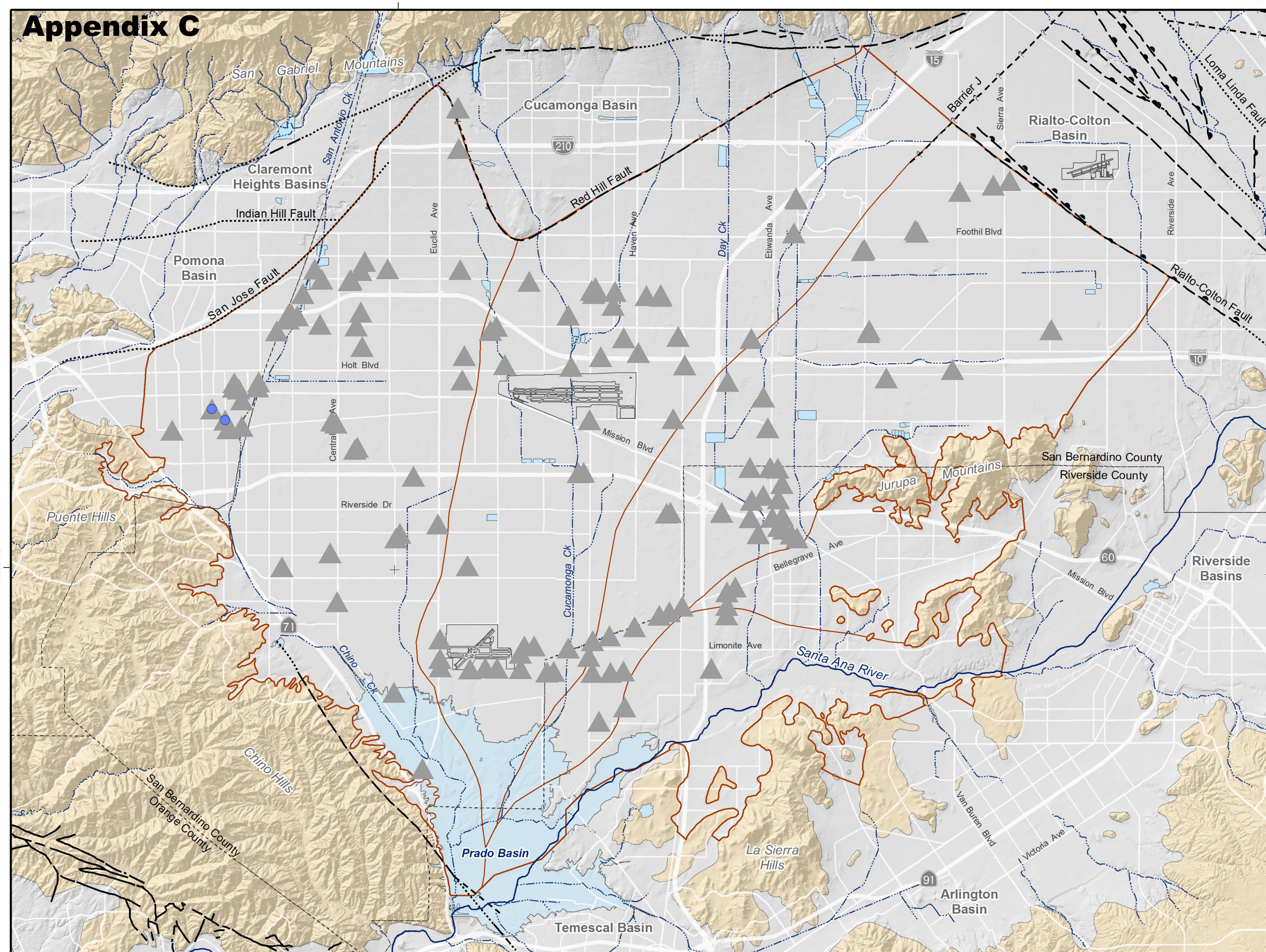
Exhibit EF-6

Summary of Drinking Water Contaminants with Notification Levels in Municipal Supply Wells

FY 2013/14 - 2017/18

Analyte	CA Drinking Water NL	Number of Active Municipal Supply Wells with Exceedance of NL	Number of Municipal Supply Wells with Exceedance of NL	Number of Total Wells in the Chino Basin with Exceedance of NL
1,4-Dioxane	1 µgl	2	2	133
Manganese	0.5 mgl	0	0	118
N-Nitrosodimethylamine (NDMA)	0.01 µgl	0	0	60
Vanadium	0.05 mgl	0	0	55
Naphthalene	0.017 mgl	0	0	48
1,2,4-Trimethylbenzene	0.33 mgl	0	0	26
1,3,5-Trimethylbenzene	0.33 mgl	0	0	19
Methyl Isobutyl Ketone	0.12 mgl	0	0	11
n-Propylbenzene	0.26 mgl	0	0	11
HMX (Octogen)	0.35 mgl	0	0	11
Chlorate	0.8 mgl	0	0	4
Formaldehyde	0.1 mgl	0	0	3
N-Nitrosodiethylamine (NDEA)	0.01 µgl	0	0	3
Ethylene Glycol	14 mgl	0	0	1
n-Butylbenzene	0.26 mgl	0	0	1

Appendix C



- Active Municipal Supply Well
- Well exceeds NL of 1 µgl for 1,4-Dioxane
- OBMP Management Zones
- Streams & Flood Control Channels
- Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

- Quaternary Alluvium

Consolidated Bedrock

- Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-7_Exceedance_Count_NL.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:

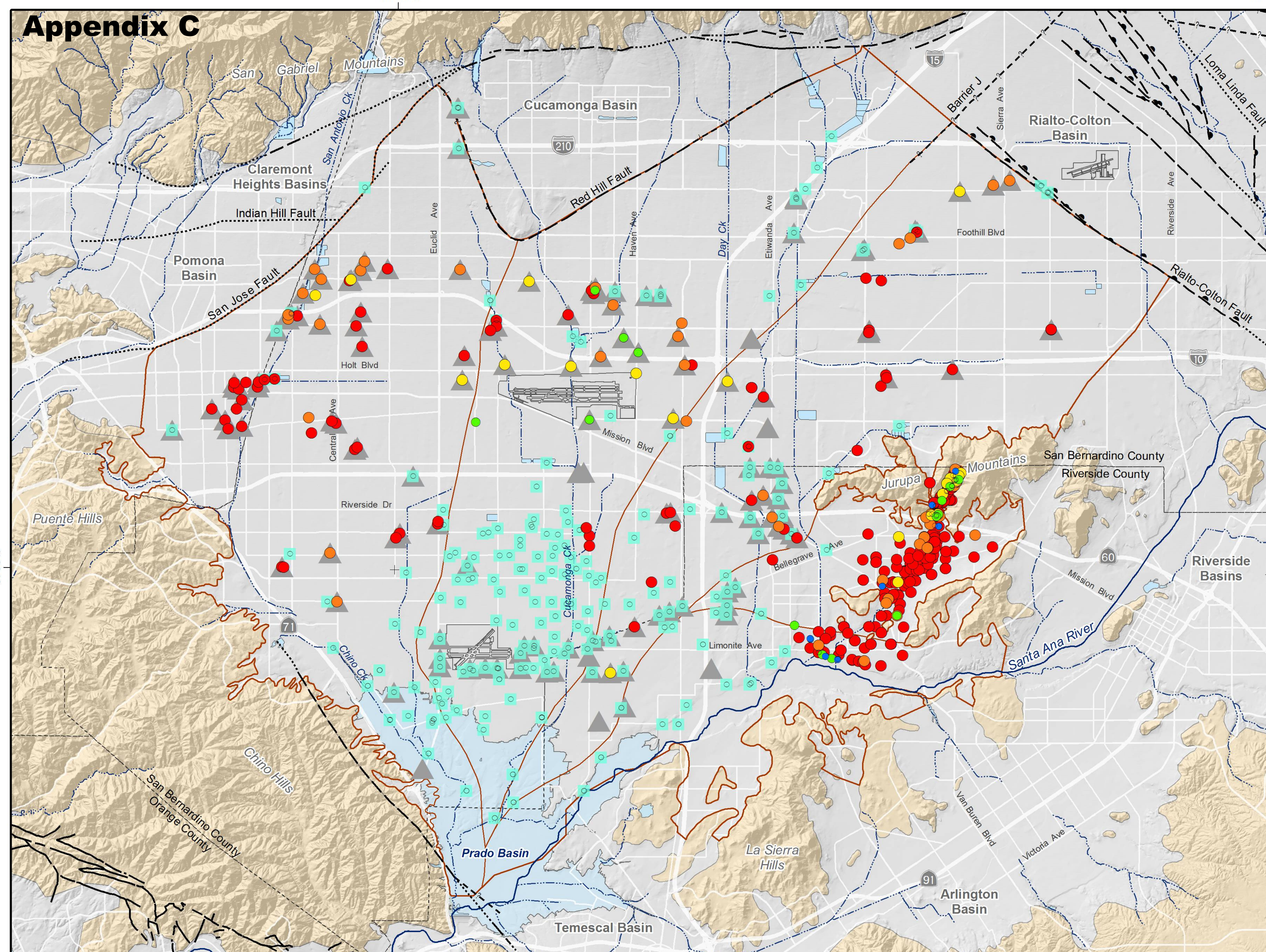
OBMP 2020 Update

Scoping Report

Contaminants that Exceed the NL in Active Municipal Supply Wells in Chino Basin

2014-2018

Exhibit EF-7



Perchlorate (µgl)

- ND
- < 0.5
- 0.5 - 1
- 1 - 2
- 2 - 4
- > 4

California MCL = 6 µgl

California PHG = 1 µgl

Well Sampled for Perchlorate but the Method Detection Limit was Greater than the PHG of 1 µgl

Active Municipal Supply Well

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Concealed
- Location Approximate
- Location Uncertain
- Approximate Location of Groundwater Barrier

Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-8_CLO4_PHG_2014-2018.mxd

0 1 2 3 4 5 Miles

0 2 4 6 8 Km

Prepared for:

OBMP 2020 Update

Scoping Report

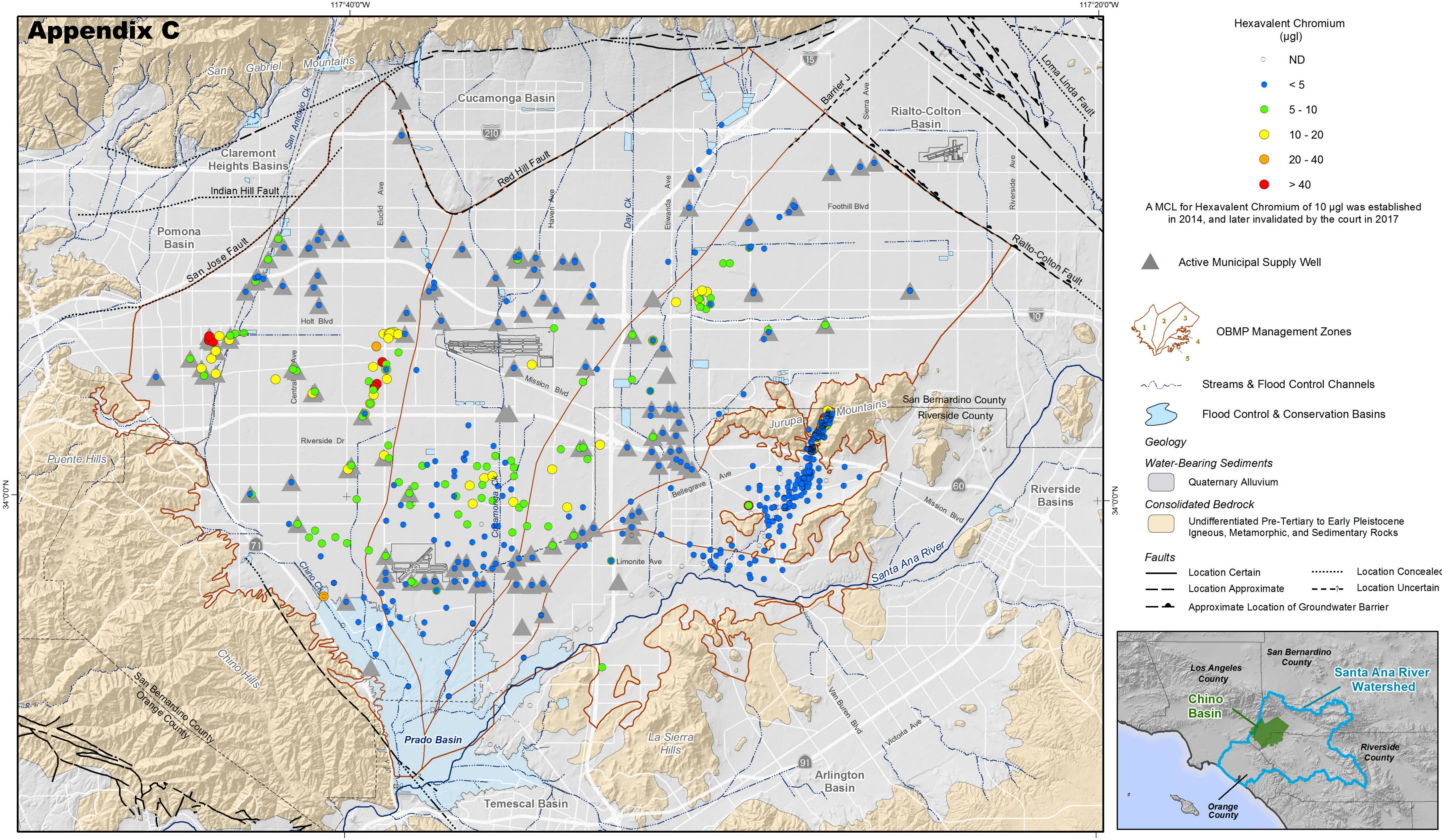
CHINO BASIN WATERMASTER
Partners in Basin Management

Maximum Perchlorate Concentration

2014-2018

Exhibit EF-8

Appendix C



Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-9_HexCr_2014-2018.mxd

Prepared for:

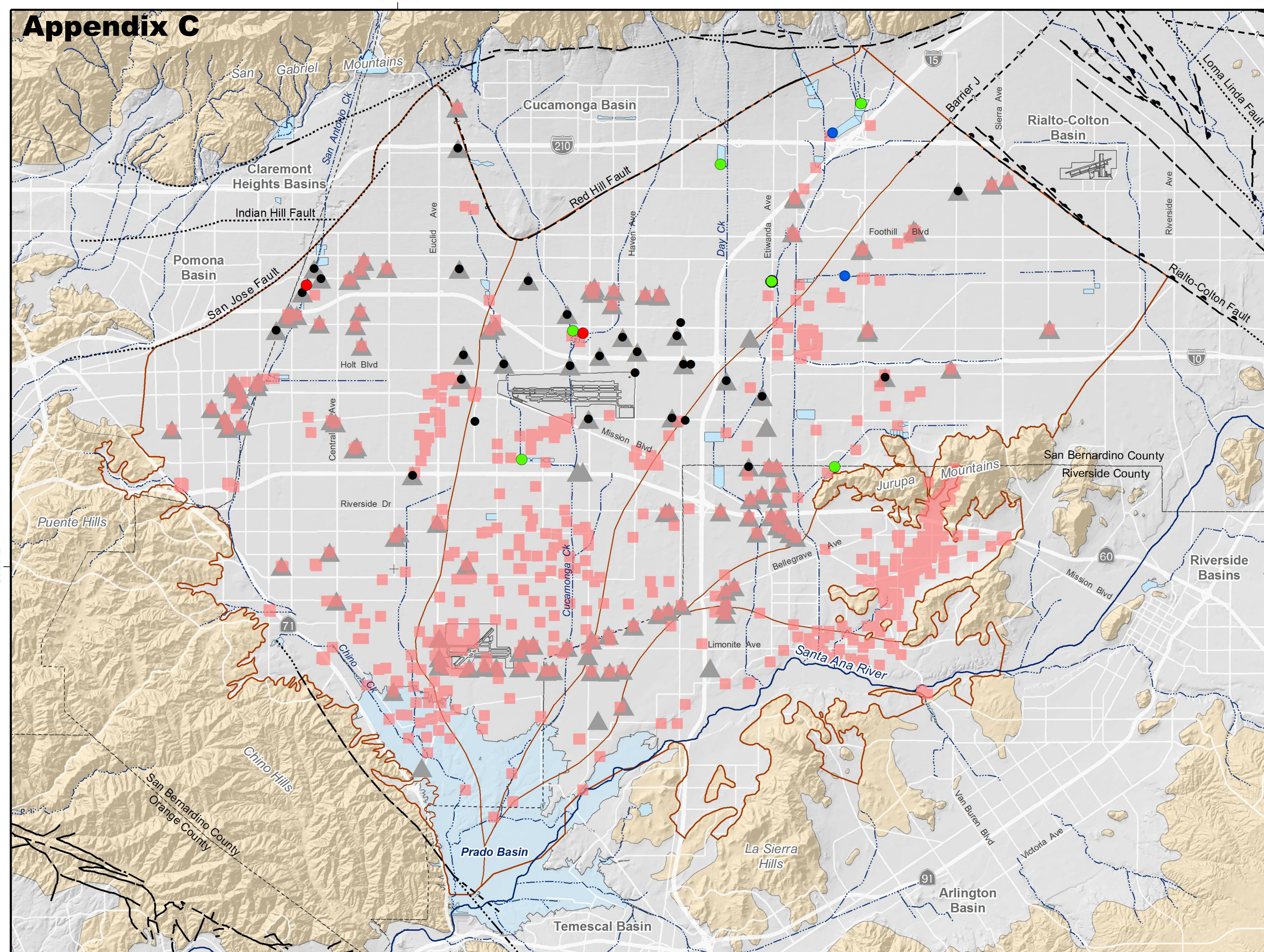
OBMP 2020 Update
Scoping Report

Chino Basin Watermaster — Partners in Basin Management

Maximum Hexavalent Chromium
2014-2018

Exhibit EF-9

Appendix C



Occurance of PFOA and PFOS in Groundwater

- Well not Sampled for PFOA or PFOS
- Well Sampled for UCMR3 between 2013-2015 Using Detection Limits of 20 and 40 ngl, higher than the Current Notification Levels (NL) of 13 and 14 ngl

Occurence of PFOA and PFOS in Blending Sources for Recycled Water Recharge

- Source Non-Detect for PFOA and PFOS
- Source with Detected Concentration Below the NLs of 13 and 14 ngl
- Source exceeding the NLs of 13 and 14 ngl
- Active Municipal Supply Well

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: CS
Date: 11/22/2019
File: Exhibit_EF-10_PFAS_1998-2019.mxd

0 1 2 3 4 5 Miles

0 2 4 6 8 Km

Prepared for:

OBMP 2020 Update

Scoping Report

CHINO BASIN WATERMASTER

PFOA and PFOS Concentrations

Through March 2019

Exhibit EF-10

Appendix C

Exhibit EF-11
Cost-Estimate and Schedule to Implement Activity EF

Task and Subtask Description	Engineering Cost	FY 2020/21				FY 2021/22				FY 2022/23				FY 2023/24 and beyond
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Task 1 Convene the Water Quality Committee, define objectives, and refine scope of work · Convene Water Quality Committee · Define objectives of Activity EF · Refine scope described in TM1 · Refine detailed cost and schedule	$65,000	$65,000												
Task 2 Develop and implement an initial emerging-contaminants monitoring plan · Determine contaminants of interest · Develop initial monitoring plan · Implement initial monitoring plan	$95,000			$50,000		$45,000								
Task 3 Perform a water quality assessment and prepare a scope to develop and implement a Groundwater Quality Management Plan · Describe current and future challenges and solutions · Develop recommendations for long-term monitoring and assessment · Prepare scope to develop and implement a groundwater quality management plan · Prepare final assessment	$135,000						$80,000			$55,000				
Task 4 Develop planning, screening, and evaluation criteria · Develop criteria to evaluate project cost and benefit · Review and finalize criteria	$ TBD												$ TBD	$ TBD
Task 5 Identify and describe potential projects for evaluation · Identify potential projects · Select projects for reconnaissance level study	$ TBD													$ TBD
Task 6 Conduct a reconnaissance-level study for the proposed projects · Characterize potential treatment projects · Evaluate Projects · Prepare finance plan for soft-costs · Prepare implementation plan	$ TBD													$ TBD
Task 7 Prepare the *Groundwater Quality Management Plan* · Prepare draft plan · Prepare final plan	$ TBD													$ TBD
Task 8 Plan, design, and build water quality management projects · Prepare preliminary design report and CEQA documentation · Prepare finance plan for project implementation · Obtain permits and agreements and prepare final design · Construct selected projects	$ TBD													$ TBD
Total Cost and Cost by FY	**$295,000**	**$115,000**				**$125,000**				**$55,000**				**$ TBD**

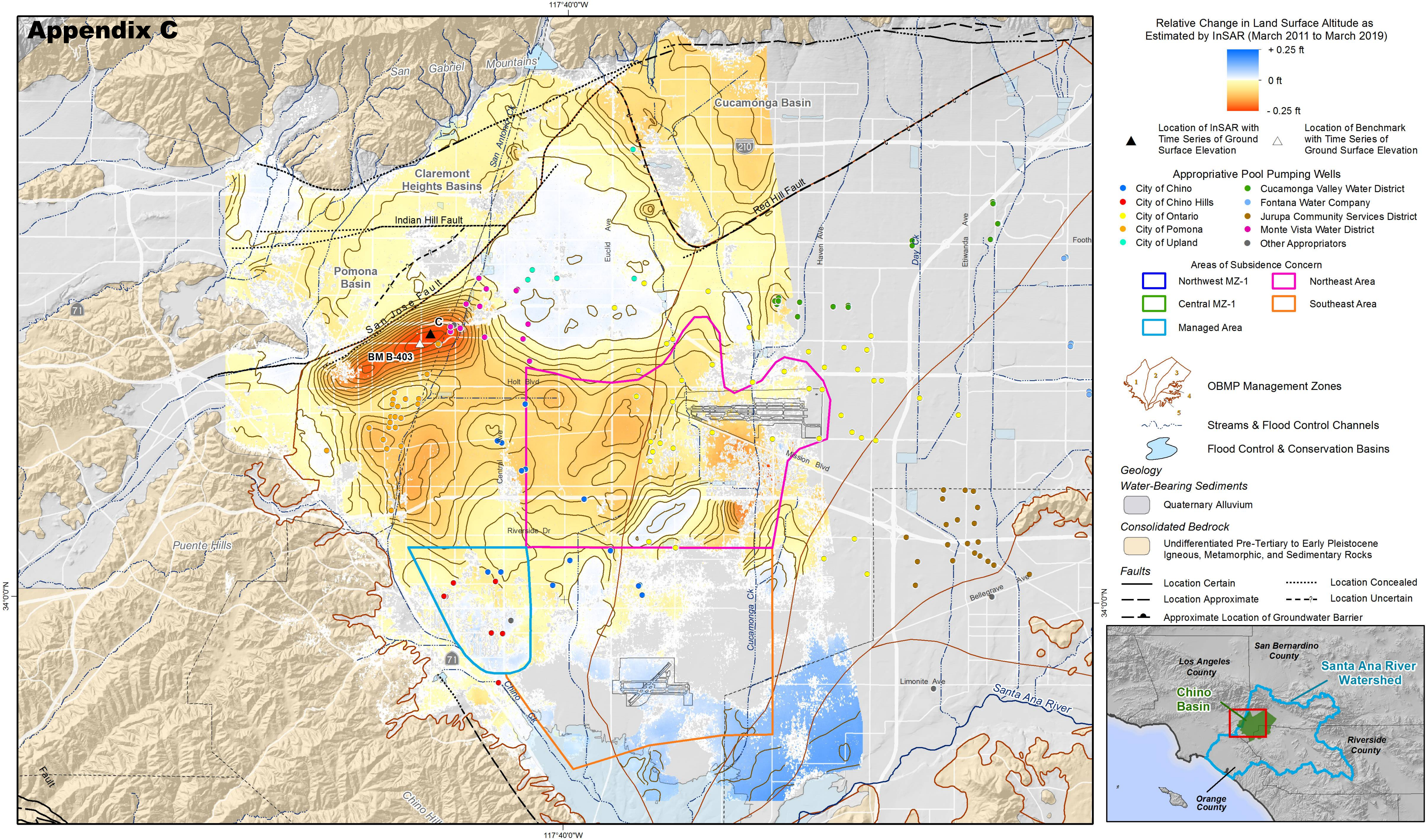
TBD -- To be determined

Exhibit CG-1
Aggregate Water Supply Plan for Watermaster Parties

Water Source	2015	2020	2025	2030	2035	2040
Volume (af)						
Chino Basin Groundwater	147,238	145,904	153,804	157,716	168,987	176,652
Non-Chino Basin Groundwater	51,398	55,755	63,441	64,999	66,691	68,483
Local Surface Water	8,108	15,932	15,932	18,953	18,953	18,953
Imported Water from Metropolitan	53,784	86,524	93,738	100,196	102,166	109,492
Other Imported Water	8,861	9,484	10,095	10,975	11,000	11,000
Recycled Water for Direct Reuse	20,903	24,008	24,285	26,583	29,836	33,223
Total	290,292	337,607	361,295	379,422	397,633	417,803
Percentage						
Chino Basin Groundwater	51%	43%	43%	42%	42%	42%
Non-Chino Basin Groundwater	18%	17%	18%	17%	17%	16%
Local Surface Water	3%	5%	4%	5%	5%	5%
Imported Water from Metropolitan	19%	26%	26%	26%	26%	26%
Other Imported Water	3%	3%	3%	3%	3%	3%
Recycled Water for Direct Reuse	7%	7%	7%	7%	8%	8%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Storage Framework Investigation - WEI, 2018

Appendix C



Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: CS
Date: 8/20/2019
File: Exhibit_CG-2_Land_Subsidence.mxd

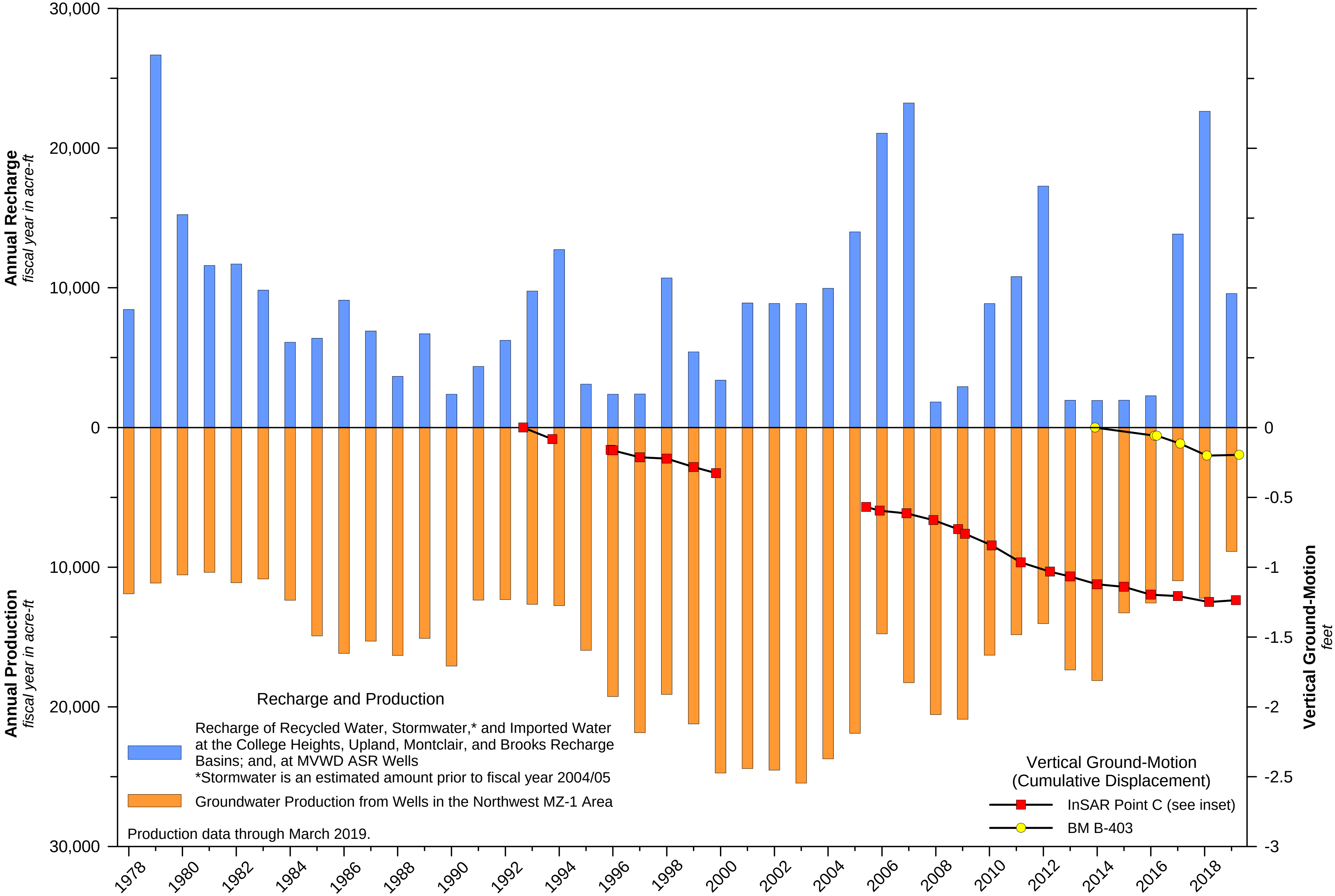
Prepared for:
OBMP 2020 Update
Scoping Report

Chino Basin Watermaster — Partners in Basin Management

Areas of Land Subsidence
2011-2019

Exhibit CG-2

Appendix C



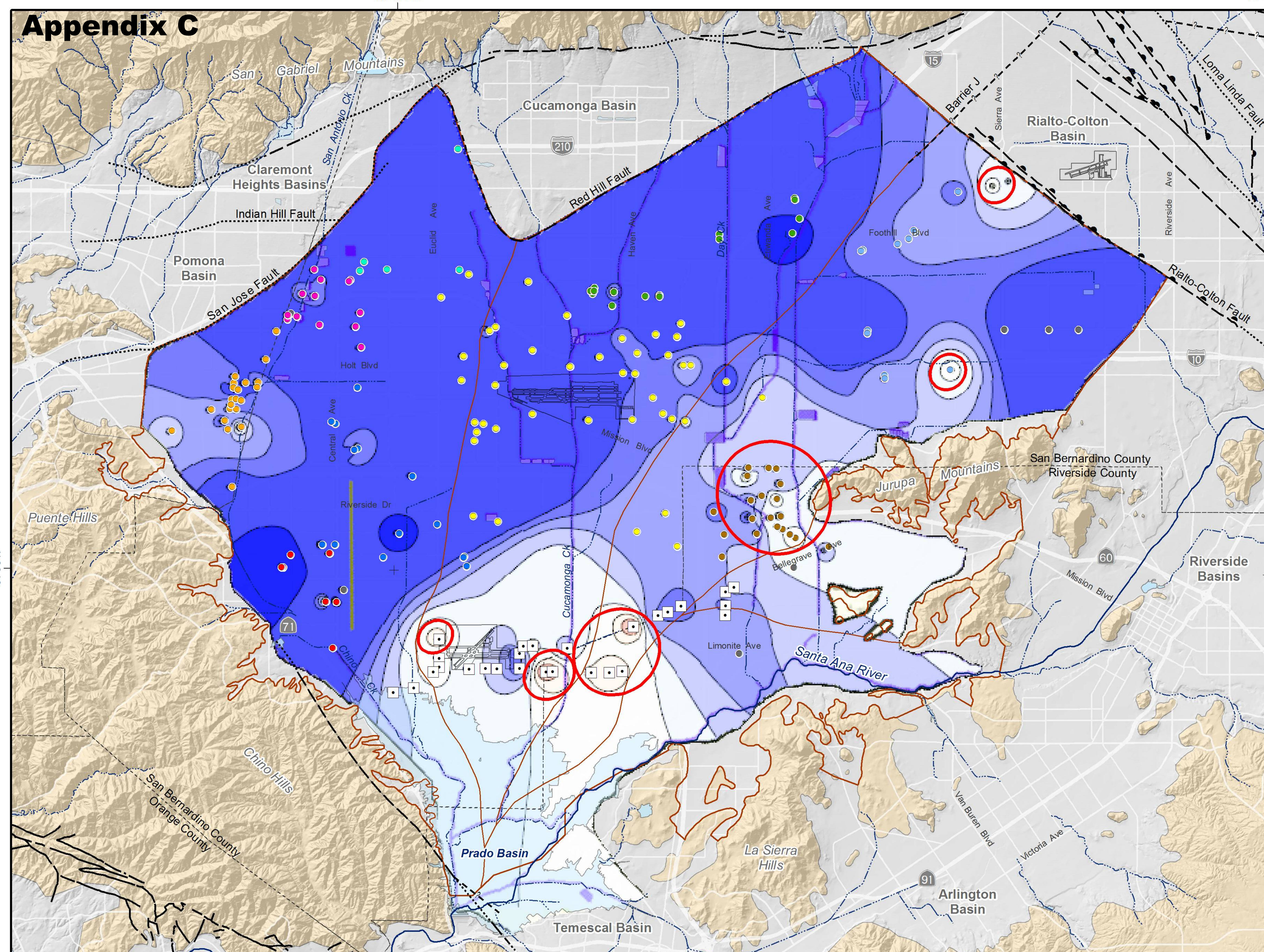
WILDERMUTH ENVIRONMENTAL, INC.

Prepared for:
OBMP 2020 Update
Scoping Report

Pumping, Recharge and Land Subsidence in the Northwest MZ-1 Area

Exhibit CG-3

Appendix C



117°40'0"W

117°20'0"W

Projected Groundwater Level Minus Sustainability Metric (ft)

- 200 - 400
- 100 - 200
- 80 - 100
- 60 - 80
- 40 - 60
- 20 - 40
- 0 - 20
- -20 - 0
- -40 - -20

Area below pumping sustainability metric

Appropriative Pool Pumping Wells

- City of Chino
- City of Chino Hills
- City of Ontario
- City of Pomona
- City of Upland
- Cucamonga Valley Water District
- Fontana Water Company
- Jurupa Community Services District
- Monte Vista Water District
- Other Appropriators

Chino Desalter Well

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: CS
Date: 8/20/2019
File: Exhibit_CG-4_Prj_Difference_in_GWLs.mxd

0 1 2 3 4 5 Miles

0 2 4 6 8 Km

Prepared for:

OBMP 2020 Update

Scoping Report

Projected Difference between Groundwater Levels and the Pumping Sustainability Metric

Scenario 1A - FY 2029/30

Exhibit CG-4

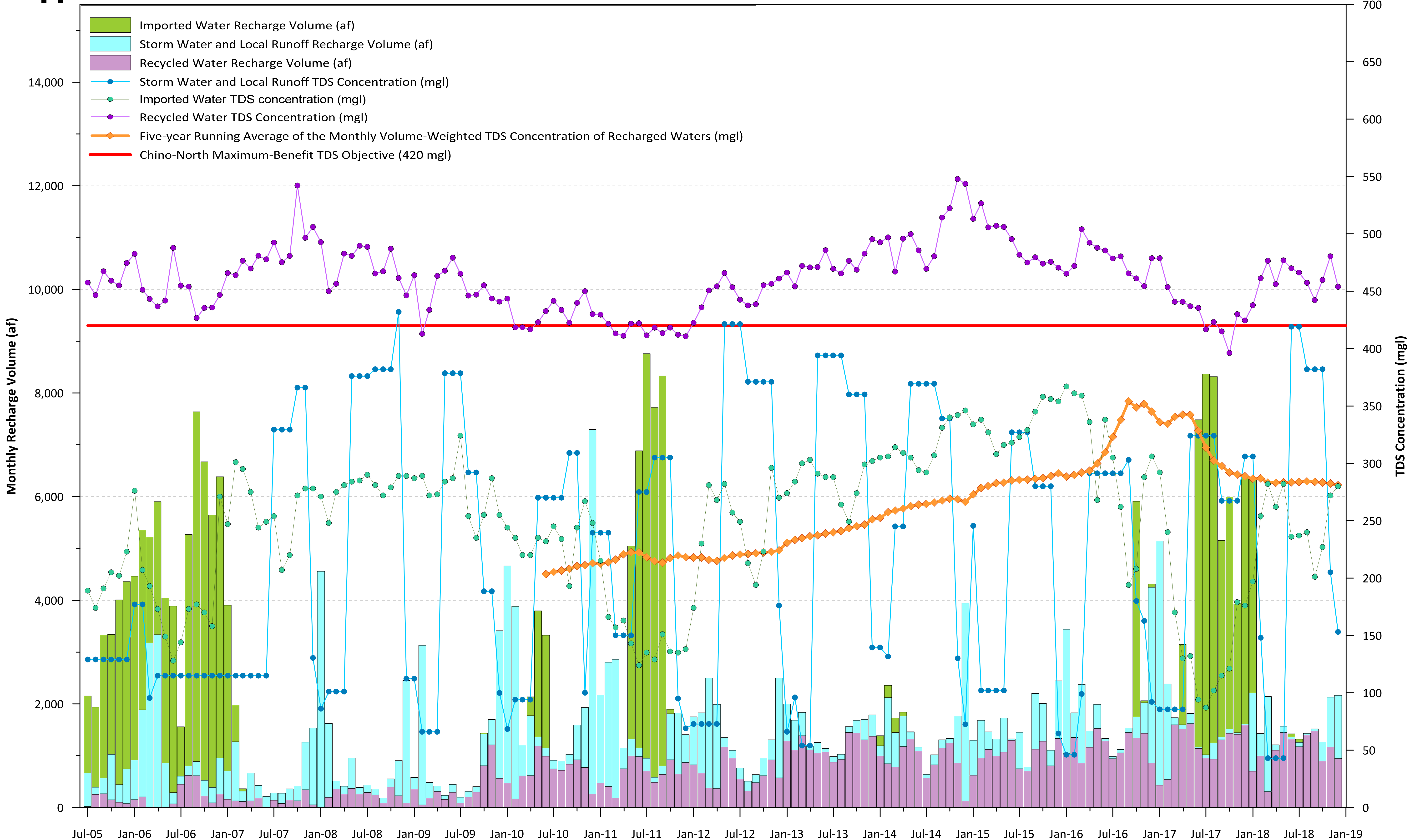
Appendix C

Exhibit CG-5
Cost-Estimate and Schedule to Implement Activity CG

Task and Subtask Description	Engineering Cost	FY 2020/21				FY 2021/22				FY 2022/23				FY 2023/24
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	and beyond
Task 1 Convene the Water Supply Reliability Committee, define objectives, and refine scope of · Convene Water Supply Reliability Committee · Define objectives of Activity CG · Define reliability and other benefits expected from Activity CG · Refine scope described in TM1 · Refine detailed cost and schedule	$95,000		$95,000											
Task 2 Characterize water demands, water supply plans and existing/planned infrastructure and their · Characterize the water supplies and future water demands · Characterize exiting infrastructure to convey, treat, and distribute the supplies to meet the demands · Identify limitations to the existing infrastructure	$210,000				$70,000	$140,000								
Task 3 Develop planning, screening, and evaluation · Develop criteria to evaluate project cost and benefit · Review and finalize criteria	$ TBD							$ TBD						
Task 4 Describe water supply reliability opportunities · Identify potential projects · Select projects for reconnaissance level study	$ TBD								$ TBD					
Task 5 Develop reconnaissance-level engineering design and operating plan · Characterize potential water supply reliability projects · Evaluate Projects · Prepare finance plan for soft-costs · Prepare implementation plan	$ TBD									$ TBD				$ TBD
Task 6 Plan, design, and build water supply reliability alternatives · Prepare preliminary design report and CEQA documentation · Prepare finance plan for project implementation · Obtain permits and agreements and prepare final design · Construct selected projects	$ TBD													$ TBD
Total Cost and Cost by FY	**$305,000**	**$165,000**				**$140,000**				**$TBD**				**$ TBD**

TBD -- To be determined

Appendix C



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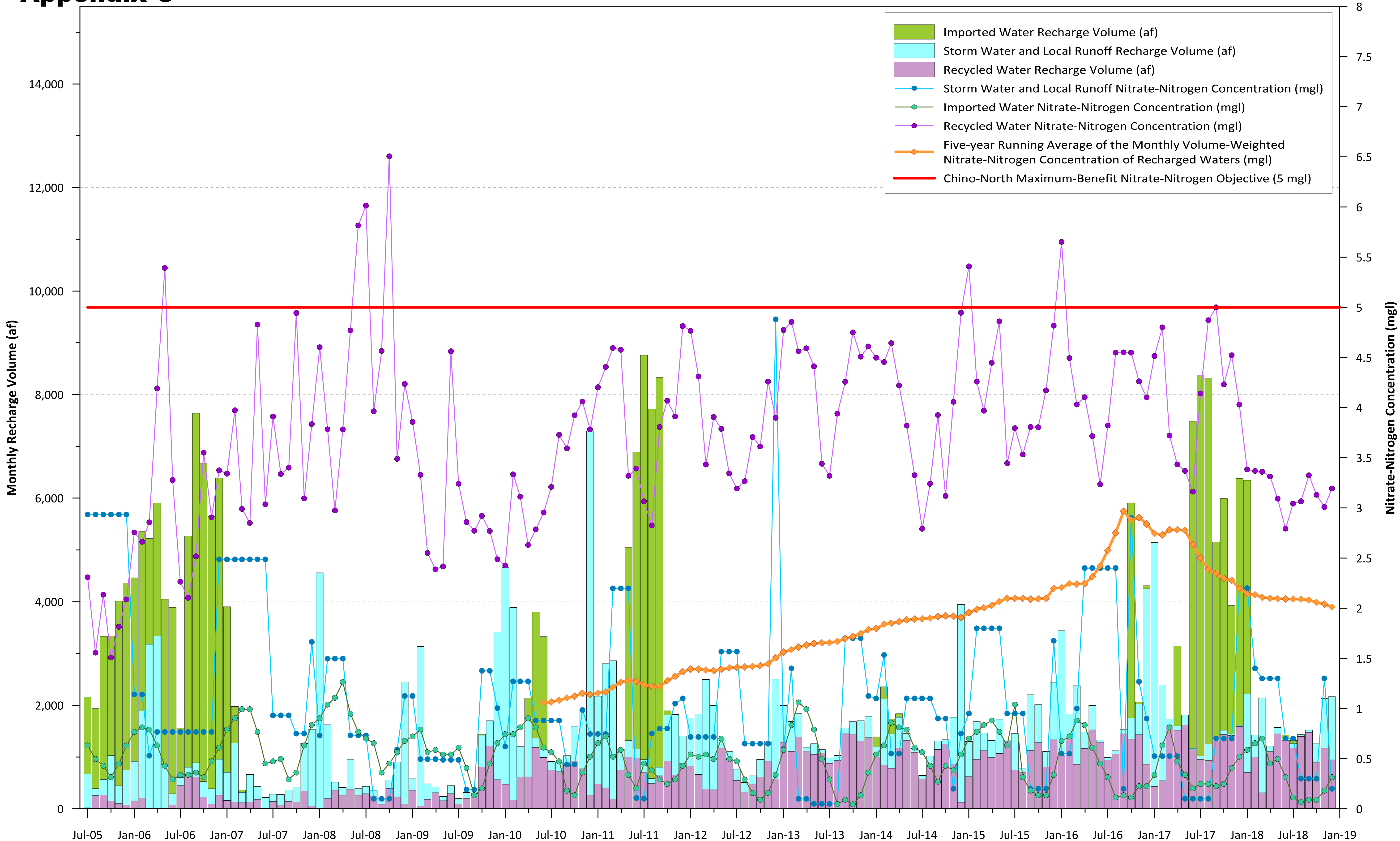
OBMP 2020 Update
Scoping Report

Volume and Total Dissolved Solids (TDS) Concentrations of Recharge Water Sources in the Chino Basin
2005-2018

Exhibit K-1

Appendix C



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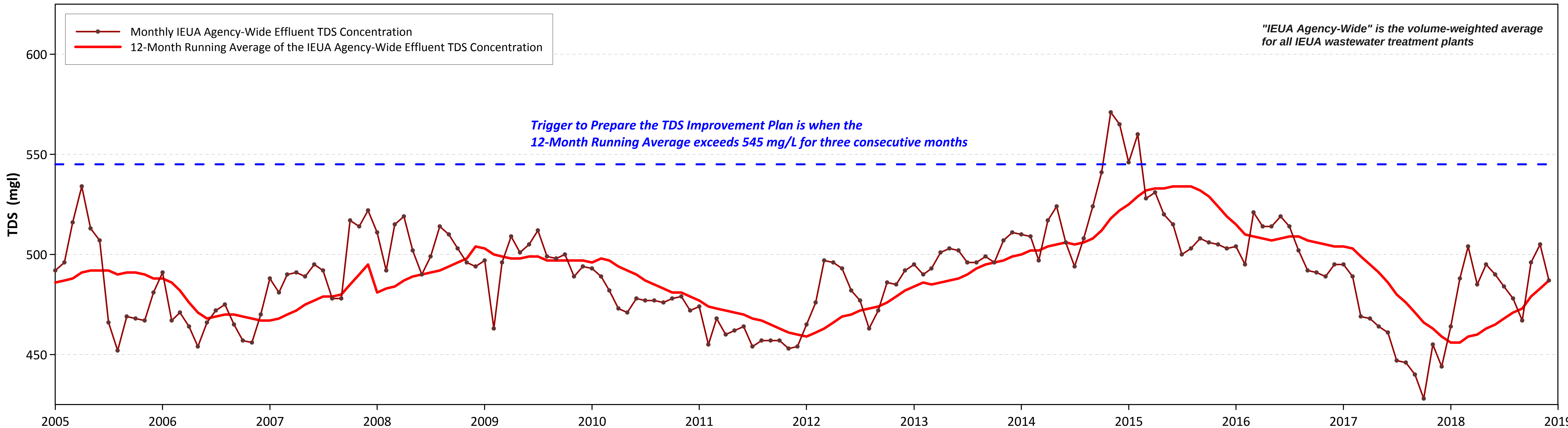
WILDERMUTH ENVIRONMENTAL, INC.

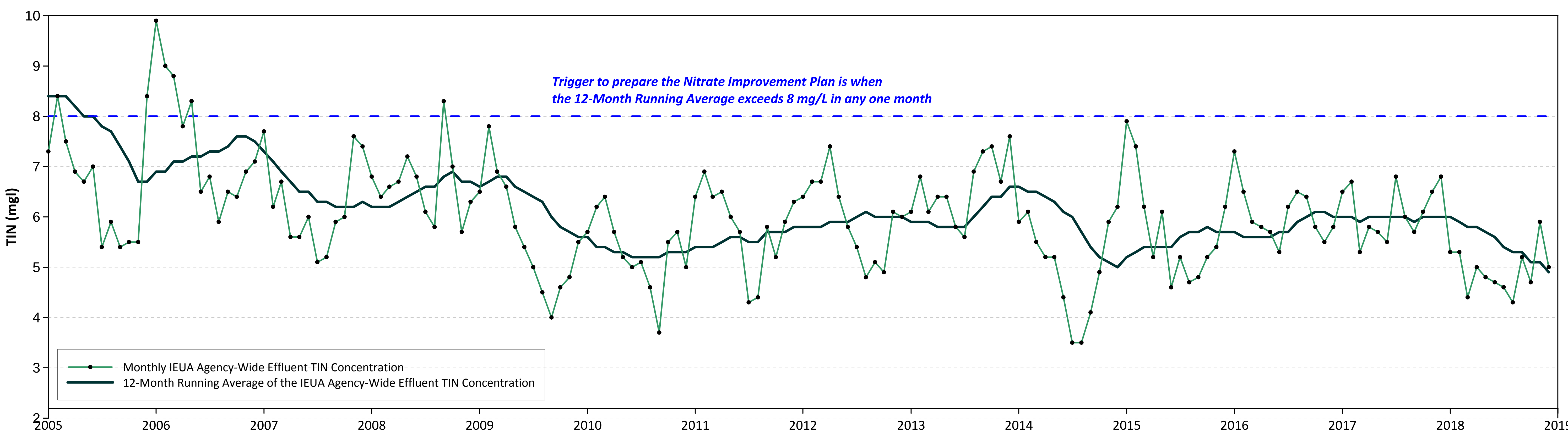
Prepared for:
OBMP 2020 Update
Scoping Report

Volume and Nitrate-Nitrogen Concentrations of Recharge Water Sources in the Chino Basin
2005-2018

Exhibit K-2

Appendix C





WEI
Wildermuth Environmental, Inc.

Prepared for:
OBMP 2020 Update
Scoping Report

Monthly and 12-Month Running Average of the IEUA Agency-Wide Effluent Total Dissolved Solids (TDS) and Total Inorganic Nitrogen (TIN) Concentrations
2005-2018

Exhibit K-3

Appendix C

Exhibit K-4
Cost Estimate and Schedule to Implement Activity K

Task and Subtask Description	Engineering Cost	FY 2020/21				FY 2021/22				FY 2022/23				FY 2023/24 and beyond
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
Task 1 Prepare projection to evaluate compliance with recycled water recharge dilution requirements. · Prepare projections · Evaluate projections for future wet and dry periods within 5 and 10 years · Determine the if there is a compliance challenge	$0	$0												
Task 2 Identify alternative compliance strategies · Identify potential compliance strategies · Select projects for reconnaissance level study	$ TBD					$ TBD								
Task 3 Evaluate alternative compliance strategies · Characterize alternative compliance startegies · Rank alternatives · Prepare finance plan for soft-costs · Prepare report	$ TBD								$ TBD	$ TBD				$ TBD
Task 4 Implement the alternative compliance strategy · Prepare preliminary design report and CEQA documentation · Prepare finance plan for project implementation · Obtain permits and agreements and prepare final design · Construct selected projects	$ TBD													$ TBD
Task 5 Periodically re-evaluate compliance with dilution requirements · Prepare projections of the dilution metric on a five-year frequency · Annually report current and future compliance with the dilution limit	$ TBD													$ TBD
Total Cost and Cost by FY	**$0**	**$0**				**$ TBD**				**$ TBD**				**$ TBD**

TBD -- To be determined

Appendix C

Exhibit L-1

Chino Basin Watermaster -- Monitoring and Reporting Requirements, Data Types, Analyses Performed, Report Contents, and Past Efforts to Reduce Scope/Cost

Purpose/Requirement/Schedule	Data Types									Analyses Performed	Report Content	Past Efforts to Reduce Scope and Cost
	GWP	GWL	GWQ	SW	GL	GEOL	BIO	WS/WU	PLAN			
Water Rights Compliance Monitoring. Pursuant to Term 20 of Watermaster's Water Rights Permit 21225 and an agreement with the California Department of Fish and Wildlife (DFW), Watermaster must prepare an annual report of estimates of monthly changes in discharge in each tributary to the Santa Ana River that resulted from diversions of storm water and dry-weather flow for recharge in the Chino Basin. The annual report covers the 12-month period of July 1 through June 30, and is submitted to the DFW by October 1 of each year.				X						Watermaster Engineer prepares the report with review and input from Watermaster Counsel, which includes the following efforts: 1. Measured data and Watermaster's surface-water model are used to estimate the discharge in flood control channels that cross the Chino Basin and the diversions for recharge. 2. To compute the differences in discharge caused by the diversions for recharge, the discharge from the tributaries to the Santa Ana River is estimated with and without the Watermaster diversions.	A letter report is prepared, including text and exhibits, that describes the data, methods, and results of the analysis.	This report has become standardized and the scope has been reduced to the minimum required for compliance. The cost to complete this work has not increased over the last four years.
Sustainable Groundwater Management Act (SGMA). The SGMA requires that the Watermaster of an adjudicated basin identified in WC Section 10720.8(a) submit specific data, information, and annual reports for the previous water year to the California Department of Water Resources (DWR) by April 1. Pursuant to SGMA WC Section 10720.8(f), Watermaster is required to submit: (A) Groundwater elevation data unless otherwise submitted pursuant to WC Section 10932 (B) Annual aggregated data identifying groundwater extraction (C) Surface water supply used for or available for use for groundwater recharge or in-lieu use (D) Total water use (E) Change in groundwater storage (F) The annual report submitted to the court	X	X		X				X		Watermaster Engineer prepares a technical memorandum, which includes the following efforts: Item (A) is already submitted for the California Statewide Groundwater Elevation Monitoring (CASGEM) Program, so no further data is reported pursuant to SGMA. Items (B), (C), (D) and (F) are compiled from the appropriators, the IEUA, and Watermaster. Item (E) is completed using the Chino Basin groundwater model to simulate storage change over the past water year.	A technical memorandum explicitly documenting the information for required items (A) through (F). The memorandum is included in the agenda packets for review by the Watermaster Pools, Advisory Committee, and Board. The memorandum and its contents are then submitted to the DWR via its online Adjudicated Basin Annual Reporting System.	Watermaster provides the minimum information required by DWR
Biannual Evaluation of the Cumulative Effect of Transfers. Pursuant to the Peace Agreement, page 20, Section 5.1 (e) (iv); the OBMP Implementation Plan, page 21, paragraph 11 (d); and the Rules and Regulations, page 51, Section 9.3, Watermaster will evaluate for the potential for any Material Physical Injury that may result from the cumulative effects of transfers of water in storage or any water rights proposed in place of physical recharge of water to the Chino Basin. The purpose of this evaluation is to provide guidance to Watermaster for future recharge activities. Reporting on this evaluation is required biannually beginning on July 1, 2003.	X	X		X				X		Watermaster Engineer performs this evaluation: 1. If necessary, re-calibrate the Chino Basin groundwater-flow model for the prior two years. 2. Evaluate Watermaster assessment packages to determine which transfers resulted in an avoided wet-water replenishment and prepare a hypothetical historical model scenario that replaces transfers with wet-water replenishment. 3. Simulate the hypothetical historical model scenario with the groundwater-flow model over the period of the Peace Agreement (since 2000). 4. Compare the results of the new model simulation with the calibrated model results to characterize the cumulative effects of transfers since the Peace Agreement.	Watermaster's Engineer prepares one report that documents: (i) any model updates that were performed, (ii) the evaluation of the Balance of Recharge and Discharge, and (iii) the evaluation of the Cumulative Effects of Transfers. The evaluation of the Cumulative Effects of Transfers characterizes the differences in: water levels (especially in areas where low water levels and subsidence are a concern); storage; the achievement and maintenance of Hydraulic Control; Santa Ana River discharge at Prado Dam; and the developed yield of the Chino Basin.	
Biannual Evaluation of the Balance of Recharge and Discharge. Pursuant to Section 7 of the Rules and Regulations, page 35, 7.1 (b) (iii) and (iv) and the Peace Agreement, page 20, Section 5.1 (e) (iii), Watermaster will conduct an evaluation of the Hydrologic Balance of recharge and discharge in the Chino Basin. The purpose of this evaluation is to provide guidance to Watermaster for future recharge activities to promote the goal of equal access to groundwater in each area and sub-area of the Chino Basin. Reporting on this evaluation is required biannually beginning on July 1, 2003.									X	Watermaster Engineer performs this evaluation: 1. Use the same version of the groundwater-flow model that is used for the evaluate of the Cumulative Effect of Transfers. 2. Prepare an updated planning scenario that includes groundwater production projections to comport with the latest Urban Water Management Plans, the IEUA-TVMWD-WMWD planning projections, state mandated water conservation, and climate change projections. 3. Simulate the updated planning scenario with the groundwater-flow model over long-term future period. 4. Evaluate the model results with respect to changes in water levels, the areal balance of recharge and discharge and provide Watermaster with recommendations on the future locations and magnitudes of supplemental water recharge necessary to improve the balance of recharge and discharge.	Watermaster's Engineer prepares one report that documents: (i) any model updates that were performed, (ii) the evaluation of the Balance of Recharge and Discharge, and (iii) the evaluation of the Cumulative Effects of Transfers. The evaluation of the Balance of Recharge and Discharge characterizes long-term changes in water levels across the Chino Basin under the plans of the Parties and the Watermaster, and characterizes the balance of recharge and discharge.	Watermaster completed this work in 2003, 2005 and 2015 -- four reports were skipped. Watermaster evaluates the balance of recharge and discharge in other efforts that include 2007 Peace II engineering work, 2009 Production Optimization investigation, 2013 RMPU, Safe Yield reset, Storage Framework Investigation and the forthcoming 2020 Safe Yield reset.

Appendix C

Exhibit L-1

Chino Basin Watermaster -- Monitoring and Reporting Requirements, Data Types, Analyses Performed, Report Contents, and Past Efforts to Reduce Scope/Cost

Purpose/Requirement/Schedule	Data Types									Analyses Performed	Report Content	Past Efforts to Reduce Scope and Cost
	GWP	GWL	GWQ	SW	GL	GEOL	BIO	WS/WU	PLAN			
Annual Finding of Substantial Compliance with the Recharge Master Plan. Pursuant to Sections 7.3 and 8.1 of the Peace II Agreement, Watermaster must make an annual finding that it is in substantial compliance with a Court-approved Recharge Master Plan, particularly regarding the sufficiency of Replenishment capability to satisfy reasonable projections of future Desalter Replenishment Obligations following the completion of Basin Re-Operation and its associated forgiveness of Desalter Replenishment Obligations.				X					X	Watermaster Engineer performs this work: 1. Describe Watermaster's projections of future Replenishment Obligations based on the most recent production plans of the Parties. These production plans are typically extracted from Watermaster's most current groundwater modeling efforts. 2. Describe Watermaster's projections of future Replenishment capacity as documented in the Recharge Master Plan and/or current RMP implementation efforts. 3. Compare the projections of Replenishment Obligations vs. Replenishment capacity to assess compliance with the Recharge Master Plan.	A letter report is prepared to document the data, methods, and findings of the evaluation of substantial compliance with the Recharge Master Plan.	This report has become standardized, updated content derived from other Watermaster work resulting in reduced scope and reduced cost.
Annual Report of Compliance with SB 88 and SWRCB Regulations for Measurement and Reporting of Diverted Surface Water. Watermaster holds three diversion permits, issued by the SWRCB, that provide authorization to Watermaster to divert and recharge storm and dry-weather discharge. Watermaster reports annually on the amount of water diverted for recharged to the SWRCB pursuant to its permits and SWRCB regulations in Title 23, Chapter 2.7. SB 88 was signed into law by Governor Brown on June 24, 2015. Sections 15 through 18 of that law add new measurement and reporting requirements for a substantial number of diverters, including the Chino Basin Watermaster. Watermaster must demonstrate to the SWRCB its compliance with SB88. Reports are due annually by April 1, the reporting period is calendar year.				X						Watermaster Engineer performs this work: 1. Collect, compile, and summarize estimates of diversion and recharge volumes for the calendar year for each point of diversion for each permit. Much of these data and information are borrowed from the data collected and analyzed for Watermaster's *Water Rights Compliance Reporting* report. 2. Collect information from IEUA on the measurement scheme for each point of diversion (device, accuracy, methods of measurement and calculation, recording frequency). Evaluate each point of diversion for compliance with SB88. If any point of diversion is not in compliance with SB88, develop and document a plan to comply.	1. Prepare a progress report of the estimates of diversion and recharge volumes for the calendar year for each point of diversion, and submit the estimates to the SWRCB electronically on its website. 2. To comply with SB 88, Watermaster must annually report the following in addition to (1.) above: • Information on the device or method used to calculate the amount of water diverted. • Water diversion measurement, either direct diversion or diversion to storage, including the type of device(s) used, additional technology used, who installed the device(s), and any alternative method(s) used in measuring water diversion.	As to the progress report, this work has been reduced to filling out a form on SWRCB water rights portal. As to SB88 compliance, this is a new regulation and Watermaster staff has approached regulations in a way to minimize compliance cost.
Safe Yield Recalculation. Pursuant to the OBMP Implementation Plan and Section 6.5 of Watermaster's Rules and Regulations, Watermaster is required to recalculate and reset the Safe Yield of the Chino Basin in fiscal year 2010/11 and every ten years thereafter. The purpose of the recalculation and reset is to prevent Overdraft, and continue to operate the Chino Basin pursuant to the Physical Solution of the Judgment.	X	X	X	X	X	X		X	X	Watermaster Engineer performs the analysis, and prepares the report. Pursuant to the Safe Yield Reset Technical Memorandum, the methodology to recalculate Safe Yield is: 1. Collect new hydrogeologic information collected since the last model calibration and all the historical hydrologic and water use data, revise conceptual and numerical models and recalibrate groundwater model. 2. Update existing and projected cultural conditions and determine if future projections will based on: (a) long-term historical record of precipitation falling or (b) precipitation projections based on Global System Models to estimate the long-term average net recharge to the Basin. 3. Update pumping projections and all recharge and discharge components that are input to the models. 4. With the information generated in [1] through [3] above, use the groundwater-flow model to project the net recharge for existing current and projected future cultural conditions. 5. Qualitatively evaluate whether the groundwater production at the net recharge rate estimated in [4] above will cause or threaten to cause "undesirable results" or "Material Physical Injury". If so, identify mitigation measures or an alternative Safe Yield to prevent "undesirable results" or "Material Physical Injury."	The report documents the data collected, the model re-calibration, and the analyses performed to calculate net recharge and Safe Yield.	Watermaster developed a task memorandum in 2015 entitled Methodology to Reset Safe Yield Using Long-Term Average Hydrology and Current and Projected Future Cultural Conditions that defines the methodology for the recently approved Safe Yield. This methodology was used to develop the scope and budget for the 2020 Safe Yield reset work and reduces the cost of the 2020 Safe Yield reset relative to the past effort.

Appendix C

Exhibit L-1

Chino Basin Watermaster -- Monitoring and Reporting Requirements, Data Types, Analyses Performed, Report Contents, and Past Efforts to Reduce Scope/Cost

Purpose/Requirement/Schedule	Data Types									Analyses Performed	Report Content	Past Efforts to Reduce Scope and Cost
	GWP	GWL	GWQ	SW	GL	GEOL	BIO	WS/WU	PLAN			
Recharge Master Plan Update (RMPU). The 2010 RMPU was prepared pursuant to requirements of the Peace II Agreement and the December 2007 Court Order that approved and directed Watermaster to implement the Peace II Agreement. The Court directed Watermaster to amend the 2010 RMPU to include updated information on water demands and future replenishment projections. Watermaster completed this amendment on time in September 2013. In approving the 2013 RMPU amendment, the Court directed Watermaster to prepare recharge master plan updates on a five-year cycle. Subsequently, the 2018 RMPU was completed in October 2018 and the next report due in 2023 and every five years thereafter.				X					X	The requirements of the work to be performed in the RMPU are defined in the Peace Agreements and the 2007 report of the Special Referee (see the introduction to the 2013 RMPU amendment) Watermaster Engineer conducts the assessment, which includes: 1. Collect data related to basin management including future groundwater pumping plans, stormwater management, planned supplemental water recharge, legislation and regulations that affect recharge and prepare an assessment of how the water management has changed since the last RMP. 2. Prepare an assessment of the future Replenishment Obligations. 3. Inventory all existing recharge facilities, update their performance information, estimate the supplemental water recharge capacity of each facility and assess: (a) the adequacy of existing recharge facilities to meet future Replenishment Obligations and recharge goals and (b) the adequacy of existing recharge facilities to enable Watermaster to balance recharge and discharge. 4. Develop and analyze new projects to mitigate deficits identified in 3 above and identify new stormwater projects to increase basin yield. 5. Develop and apply criteria to screen and prioritize the recharge projects identified in 4 above and make recommendations for their implementation. 6. Prepare implementation plan.	The report documents the RMPU requirements, the data collected and planning assumption, the existing recharge capabilities, the need for additional supplemental water recharge capacity, project alternatives, screening and prioritization of alternatives and recommendations on project implementation..	This report has become standardized and the scope has been reduced to the minimum required for compliance, resulting in reduced cost relative to the 2010 and 2013 reports.
State of the Basin Report. Pursuant to Section 2.21 of the Rules and Regulations and the November 15, 2001 Court Order, Watermaster prepares a State of the Basin report every two years to describe the status of individual OBMP related activities and document how the basin has physically responded during OBMP implementation (i.e. since September 2000). The report is typically finalized by June 30.	X	X	X	X	X			X		Watermaster Engineer prepares this report. Most of the data and information utilized to prepare the report are acquired from other Watermaster monitoring and reporting efforts. Text, tables, charts, and maps are prepared to characterize: hydrology, production, recharge (replenishment and other recharge), groundwater levels and quality, point-source groundwater contamination, land subsidence, Hydraulic Control, desalter planning and engineering, and production meter installation.	The report includes annotated maps, charts, and tables that characterize the physical state of the basin and how it has changed since 2000. The report is published as a tabloid-sized map atlas and a PDF file for online viewing.	This report has evolved over time from a complex engineering report to simpler, graphically-intense and more readable report. In this process the scope and cost to produce the report was reduced.
California Statewide Groundwater Elevation Monitoring Program (CASGEM). Pursuant to Water Code section 10920, Watermaster must measure and report groundwater-elevation data from a subset of wells to the Department of Water Resources' CASGEM website twice per year (January 1 and July 1) for the Chino (8-2.01) and Cucamonga (8-2.02) Groundwater Subbasins of the Upper Santa Ana Valley Groundwater Basin (8-2).		X								Watermaster Engineer reviews time-series charts of groundwater elevations from a defined set of 37 wells in the Chino Basin and nine (9) wells in the Cucamonga Basin, and selects and compiles monthly measurements for a six-month period (summer/fall and winter/spring) that are representative of non-pumping water levels. This effort is performed in HydroDaVE Explorer. The selected data is exported from HydroDaVE in a file format for seamless upload to the CASGEM website.	The selected groundwater elevations for summer/fall and winter/spring are uploaded to the CASGEM website twice per year.	Watermaster staff reports the required groundwater-elevation data directly from its database to minimize effort and cost.

Appendix C

Exhibit L-1

Chino Basin Watermaster -- Monitoring and Reporting Requirements, Data Types, Analyses Performed, Report Contents, and Past Efforts to Reduce Scope/Cost

Purpose/Requirement/Schedule	Data Types									Analyses Performed	Report Content	Past Efforts to Reduce Scope and Cost
	GWP	GWL	GWQ	SW	GL	GEOL	BIO	WS/WU	PLAN			
Chino Basin Maximum Benefit Annual Report. This annual report is required by the Regional Board pursuant to Chapter 5 of the Basin Plan and Order No R8-2012-0026. There are a total of nine (9) maximum benefit commitments required of the Watermaster and IEUA in exchange for obtaining elevated TDS and nitrate objectives for the Chino-North Groundwater Management Zone. The Maximum Benefit commitments are: 1. The implementation of a surface-water monitoring program. 2. The implementation of a groundwater monitoring program. 3. The expansion of the Chino-I Desalter to 10 million gallons per day (mgd) and the construction of the Chino-II Desalter with a design capacity of 10 mgd. 4. The additional expansion of desalter capacity (20 mgd) pursuant to the OBMP and the Peace Agreement. 5. The completion of the recharge facilities included in the Chino Basin Facilities Improvement Program. 6. The management of recycled water quality to ensure that the agency-wide, 12-month running average wastewater effluent quality does not exceed 550 mg/L and 8 mg/L for TDS and total inorganic nitrogen (TIN), respectively. 7. The management of basin-wide, volume-weighted TDS and nitrogen concentrations in artificial recharge to less than or equal to the maximum-benefit objectives. 8. The achievement and maintenance of the "Hydraulic Control" of groundwater outflow from the Chino Basin to protect Santa Ana River water quality. 9. The determination of ambient TDS and nitrogen concentrations of Chino Basin groundwater every three years. The purpose of the annual report is to describe and document compliance with the Maximum Benefit commitments. The report is due by April 15th, and the reporting period is the calendar year.	X	X	X	X					X	Watermaster Engineer prepares the report, including the following efforts: 1. Collect, check, and upload groundwater-level, groundwater-quality, and surface water-quality data to Watermaster databases. These data are used in the analyses required to demonstrate Hydraulic Control and compute ambient water quality. 2. Review and summarize CDA progress reports on completion of the desalter well fields to achieve 40,000 afy of groundwater-production. 3. Calculate: (i) the 12-month running average of IEUA's effluent TDS concentration to determine whether it has exceeded 545 mg/L for 3 consecutive months, and (ii) the 12-month running average of IEUA's effluent TIN concentration to determine whether it has exceeded 8 mg/L in any one month. 4. Calculate: the 5-year running volume-weighted concentration of TDS and nitrate in recharged recycled water, supplemental water, and new storm water, and determine if the average is less than the TDS and nitrate Maximum Benefit objectives of the Chino-North GMZ. 5. Use groundwater-elevation contours prepared in the State of the Basin Report (every 2 years) to show the extent of Hydraulic Control. 6. Use Watermaster's groundwater-flow model (updated and recalibrated every five years) to determine if the volume of groundwater flowing past the desalter well field is *de minimis* (<1,000 afy). 7. Report on the status of the Recomputation of ambient groundwater quality for the Chino Basin groundwater management zones, which is performed once every three years (for TDS and nitrate-nitrogen). 8. Utilize data from the Santa Ana River Watermaster's Annual Reports to characterize the influence of rising groundwater from the Chino Basin on the flow and quality of the Santa Ana River.	Text and exhibits that describe the status of compliance with the Maximum Benefit commitments. The data collected each calendar year are submitted to the Regional Board as an attachment to the report.	In 2012 Watermaster staff took the lead to substantially reduce the monitoring and reporting effort required under Maximum Benefit. In particular, the surface-water monitoring and quarterly reporting components of the program were virtually eliminated and the scope of annual reporting was reduced to eliminate redundancies. These efforts resulted in an estimated $250,000 per year in cost savings (2012$).
Annual Report of the Prado Basin Habitat Sustainability Committee. The monitoring and mitigation requirements of the Peace II CEQA SEIR (Biological Resources/Land Use & Planning—Section 4.4-3) call for the IEUA, Watermaster, and the Orange County Water District to form the Prado Basin Habitat Sustainability Committee (PBHSC) to ensure that the Peace II Agreement actions will not significantly or adversely impact the Prado Basin riparian habitat. One of the responsibilities of the PBHSC is to prepare annual reports by June 30 of each year.	X	X	X	X		X	X		X	Watermaster Engineer prepares the annual report, which includes the following efforts: 1. Preparation of maps and data graphics that characterize the extent and quality of the riparian habitat in Prado Basin. 2. Preparation of maps and data graphics that characterize the trends in groundwater levels, climate and weather, surface water, and other factors that can affect the riparian habitat. This information is compared to the changes in the extent and quality of the riparian habitat to identity cause-and-effect relationships. 3. Groundwater-level change maps from existing results of Watermaster's groundwater-flow modeling are used to identify prospective areas of concern for the riparian habitat.	Summary of activities conducted for the PBHSC. Documentation of measured loss or prospective loss of riparian habitat (if any) with attribution of cause. Recommendations for ongoing monitoring and a scope of work and budget for the following fiscal year. Recommended adaptive management actions, if any, required to mitigate any measured loss or prospective loss of riparian habitat that is attributable to the Peace II activities.	After the completion of the first report in 2016, Watermaster identified efficiencies in monitoring and reporting, reducing the cost by almost 50 percent.

Appendix C

Exhibit L-1

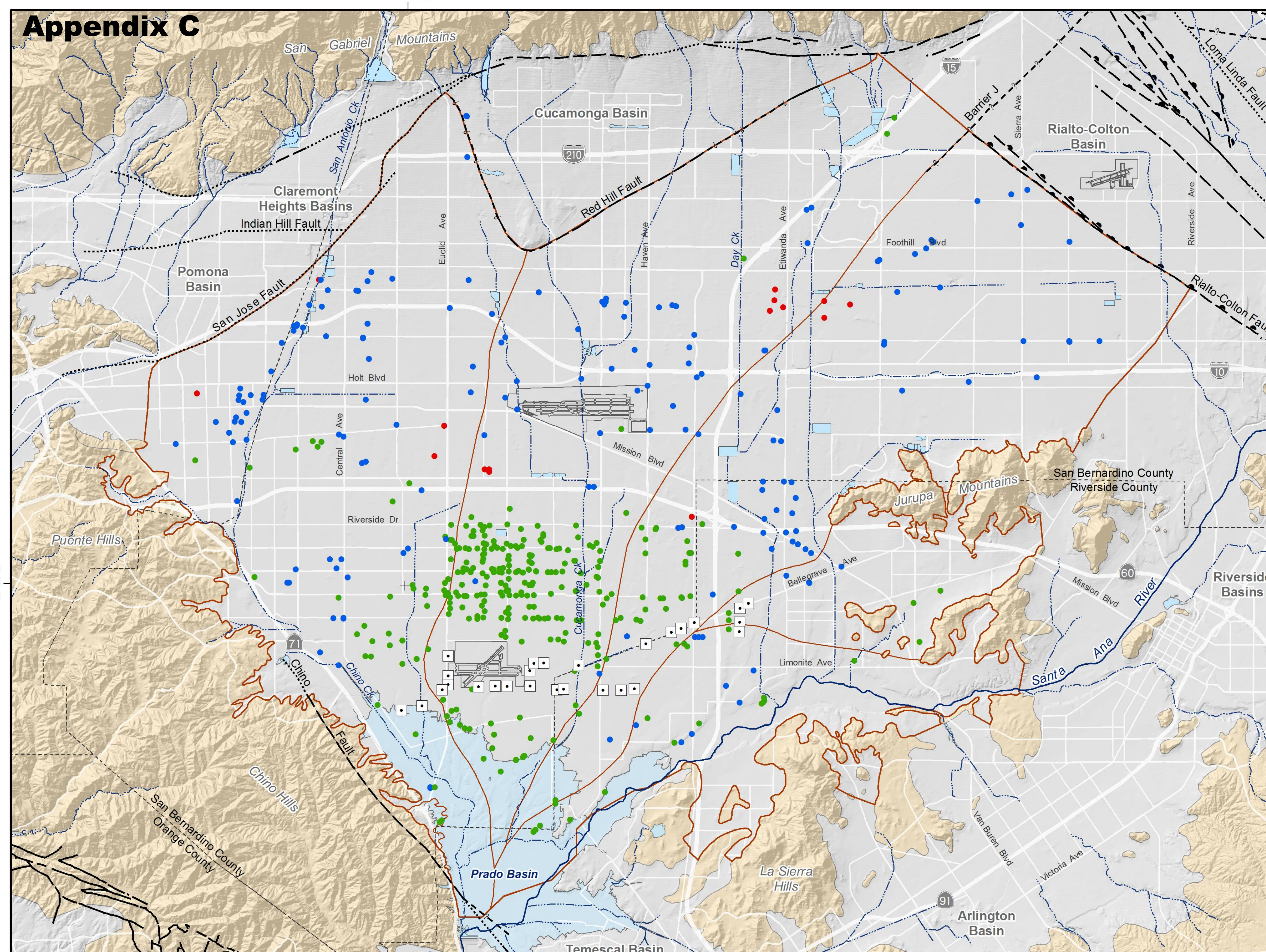
Chino Basin Watermaster -- Monitoring and Reporting Requirements, Data Types, Analyses Performed, Report Contents, and Past Efforts to Reduce Scope/Cost

Purpose/Requirement/Schedule	Data Types									Analyses Performed	Report Content	Past Efforts to Reduce Scope and Cost
	GWP	GWL	GWQ	SW	GL	GEOL	BIO	WS/WU	PLAN			
Water Recycling Requirements for the Chino Basin Recycled Water Groundwater Recharge Program. IEUA and Watermaster have a permit from the Regional Water Quality Control Board (Order R8-2007-0039, amended as R8-2009-0057) for recycled water recharge at 13 sites in the Chino Basin (Phase I and Phase II). The permit requires implementation of a monitoring and reporting program, and the submittal of the following reports: Quarterly and Annual Groundwater Recharge (GWR) Monitoring Reports, five-year Engineering Reports, and Basin Start-up Period Reports.	X	X	X	X						IEUA staff performs the analyses and prepares the reports. The analyses include the following efforts: Collect recycled water, diluent water, and groundwater data and compare to regulatory limits and specifications in the permit; report on recharge operations and any non-compliance events due to water quality, including records of any operational problems, plant upset and equipment breakdowns or malfunctions, and any diversions of off specification recycled water and the locations of final disposal; report of corrective or preventive action(s) taken; certification that no groundwater has been pumped for domestic water supply use from the buffer zone that extends 500 feet and 6-months underground travel time from the recharge basin(s) where recycled water is applied; mass balance calculations to ensure bleeding is occurring in the aquifer; and estimates of approximate travel times of recharged recycled water in the aquifer at each basin. Watermaster, as the co-permittee, has its Engineer provide technical support and review and comment on all reports before they are submitted to the permitting agencies.	Quarterly GWR Monitoring Reports: Summaries of the data in tabular form to demonstrate compliance with permit limits and specifications. Summary of recharge operations and any operational problems and preventive and/or corrective actions taken. Annual GWR Reports: Summaries of recycled water and groundwater monitoring efforts for the year. Demonstration of recycled water recharge and diluent water in-aquifer blending by 120-month mass-balance calculations presented in Recycled Water Contribution (RWC) Management Plans and analysis of monitoring well water quality data. Estimates of approximate travel times of recharged recycled water in the aquifer. Five-year Engineering Reports: Address all project changes over the last five years. Basin Start-up Period Reports: Determination of percolation rates, soil aquifer treatment efficiency, lysimeter monitoring program, and initial maximum average RWC limits.	This report has become standardized and the scope has been reduced to the minimum require for compliance, resulting in reduced cost.
Annual Report of the Ground-Level Monitoring Committee. The MZ-1 Subsidence Management Plan (MZ-1 Plan) was developed by the MZ-1 Technical Committee (now named the Ground-Level Monitoring Committee) and approved by Watermaster in October 2007. In November 2007, the Court approved the MZ-1 Plan and ordered its implementation. The MZ-1 Plan was updated in 2015 and is now called the Chino Basin Subsidence Management Plan (SMP). Pursuant to the SMP, Watermaster prepares an annual report that includes the results of ongoing monitoring efforts, interpretations of the data, and recommended adjustment to the SMP, if any.	X	X		X	X	X			X	Watermaster Engineer prepares the annual report, which includes the following efforts: Preparation and interpretation of maps and graphics of data generated from the Ground-Level Monitoring Program including: the basin stresses of groundwater pumping and recharge, and the basin responses of changes in groundwater levels, aquifer-system deformation, and ground motion.	Background information on the program. Summary of activities conducted for the Ground-Level Monitoring Program. Analysis and interpretation of data. Conclusions and recommendations for ongoing monitoring and a scope of work and budget for the following fiscal year. Recommended updates to the SMP, if any.	The GLMC meets annually to review data and develop an appropriate scope of work for the monitoring program for the subsequent year. The monitoring program has continually evolved to identify and implement efficiencies, address the concerns of the GLMC, and meet the requirements of the SMP.
OBMP Semi-Annual Status Reports. Pursuant to the July 13, 2000 Court Order that approves Watermaster's adoption of the Peace Agreement and the OBMP Implementation Plan, Watermaster is required to prepare semi-annual status reports to the Court on OBMP implementation. The purpose of the report is to provide the Court with updates on progress in implementing the OBMP.	X	X	X	X	X	X	X	X	X	Watermaster staff, with the assistance of Watermaster Engineer and Counsel, prepare text descriptions of activities that were conducted to implement the OBMP for the prior six months.	Descriptions of activities that implement the OBMP program elements for the prior six months.	This report has become standardized and the scope has been reduced to the minimum required for compliance, resulting in reduced cost.
Semi-Annual Reports to the Watermaster Pools, Advisory Committee, and Board meetings. The Parties have requested semi-annual reports that summarize the status of: (i) the groundwater contaminant plumes in the Chino Basin and (ii) the activities of the Ground-Level Monitoring Committee.	X	X	X		X					Watermaster Engineer prepares text descriptions of activities performed during the previous quarter.	A text description of status of each of the known plumes within the Chino Basin and the activities of the Ground-Level Monitoring Committee.	This report has become standardized and the scope has been reduced to the minimum required for compliance, resulting in reduced cost.

Key for Data Types:

- GWP -- Groundwater-production monitoring
- GWL -- Groundwater-level monitoring
- GWQ -- Groundwater-quality monitoring
- SW -- Surface-water and climate monitoring
- GL -- Ground-level (subsidence) monitoring
- GEOL -- Well construction, abandonment, and destruction monitoring
- BIO -- Biological monitoring
- WS/WU -- Water-supply and water use monitoring
- PLAN -- Planning information

Appendix C



Groundwater Production Wells by Pool

- Agricultural Pool (Pool 1 - 276 Wells)
- Overlying Non-Agricultural Pool (Pool 2 - 13 Wells)
- Appropriative Pool (Pool 3 - 143 Wells)
- Chino Basin Desalter Authority (25 Wells)

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

Author: SO
Date: 11/21/2019
File: Exhibit_L2_Groundwater Prod_.mxd

0 1 2 3 4 5 Miles

0 2 4 6 8 Km

Prepared for:

OBMP 2020 Update

Scoping Report

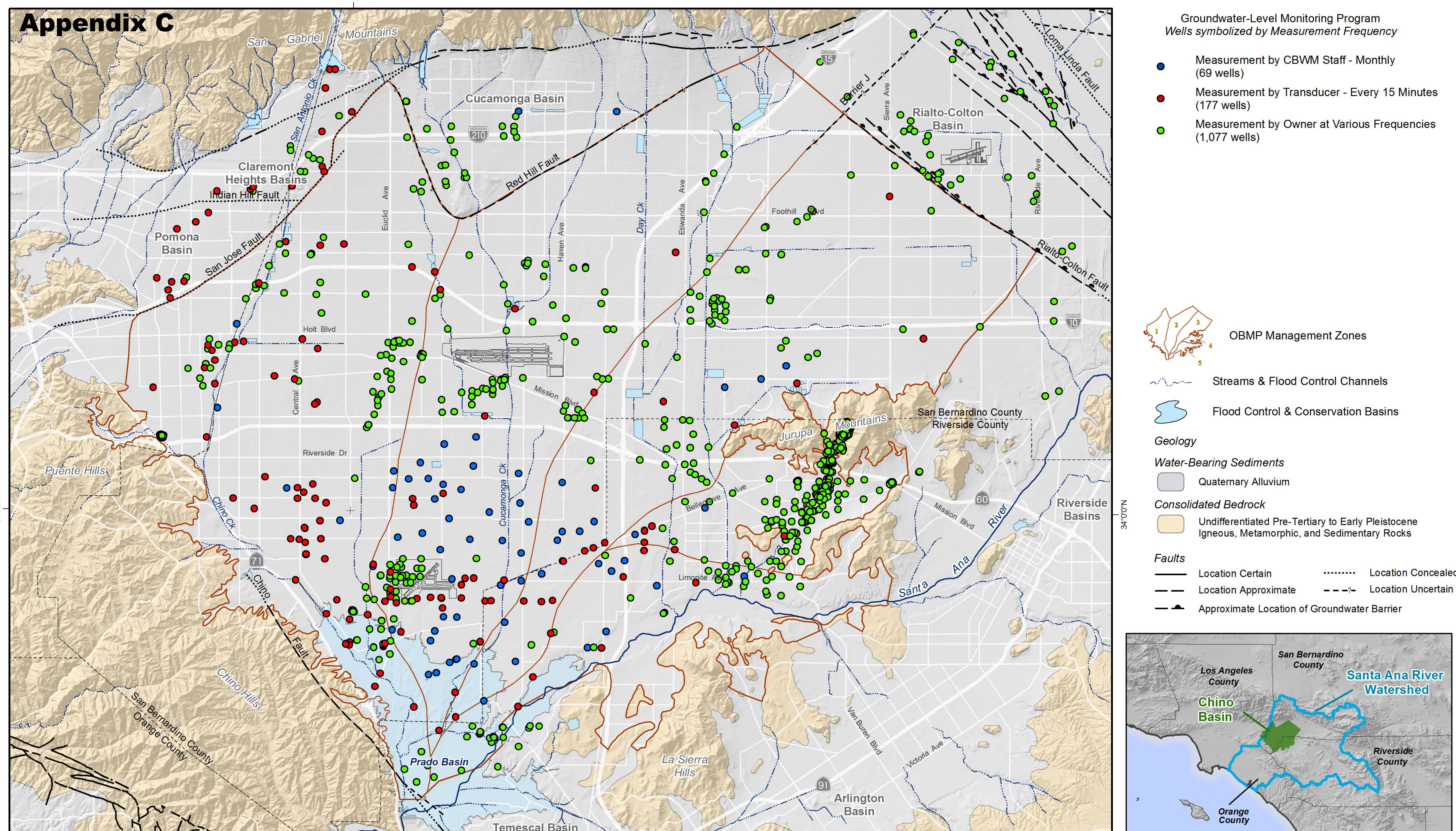
CHINO BASIN WATERMASTER — Partners in Basin Management

Groundwater-Production Monitoring

Fiscal Year 2017/18

Exhibit L-2

Appendix C



Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 11/21/2019
File: Exhibit_L3_GWL.mxd

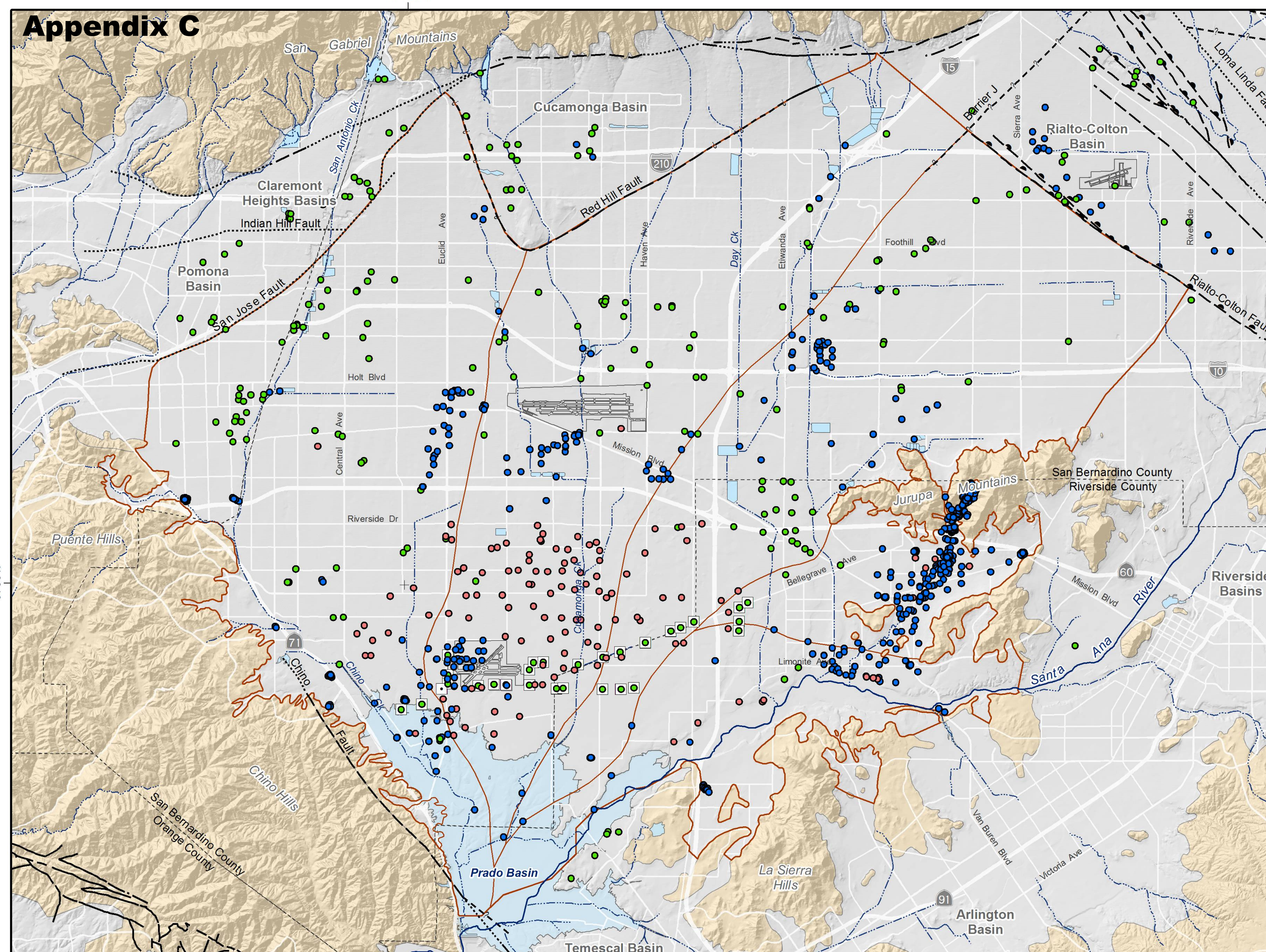
Prepared for:
OBMP 2020 Update
Scoping Report

Chino Basin Watermaster — Partners in Basin Management

Groundwater-Level Monitoring
Well Location and Measurement Frequency
Fiscal Year 2017/18

Exhibit L-3

Appendix C



Wells with Groundwater-Quality Data
(June 2013 to June 2018)

- Monitoring Wells (986 wells)
- Municipal Production Wells (248 wells)
- Private Production Wells (123 wells)
- Chino Basin Desalter Wells

OBMP Management Zones

Streams & Flood Control Channels

Flood Control & Conservation Basins

Geology

Water-Bearing Sediments

Quaternary Alluvium

Consolidated Bedrock

Undifferentiated Pre-Tertiary to Early Pleistocene Igneous, Metamorphic, and Sedimentary Rocks

Faults

- Location Certain
- Location Approximate
- Approximate Location of Groundwater Barrier
- Location Concealed
- Location Uncertain

Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 8/22/2019
File: Exhibit_L4_GWQ.mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:

OBMP 2020 Update

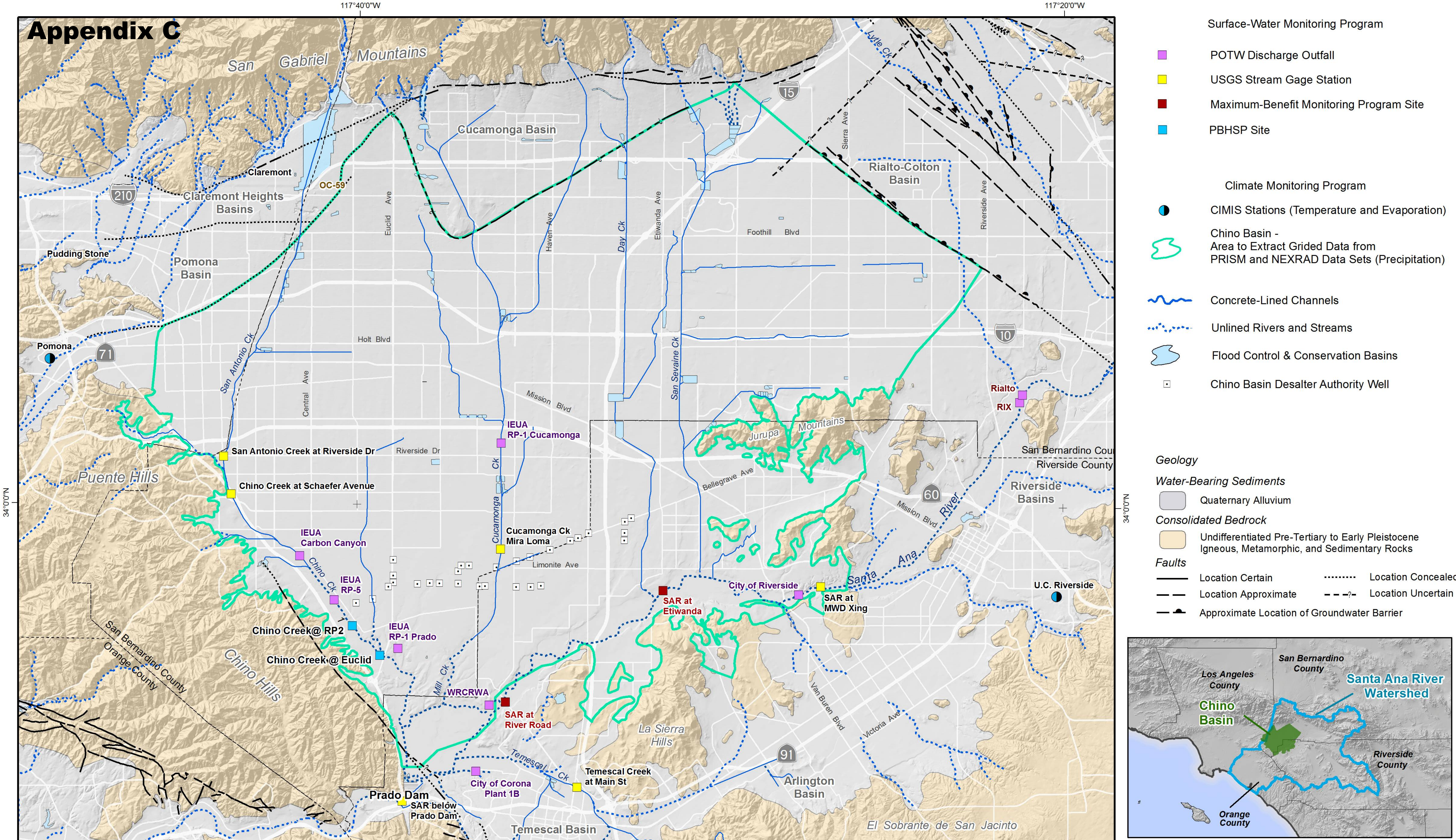
Scoping Report

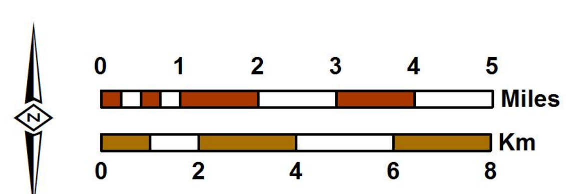
Groundwater-Quality Monitoring

July 2013 to June 2018

Exhibit L-4

Appendix C





Prepared by:

WEI
WILDERMUTH ENVIRONMENTAL, INC.

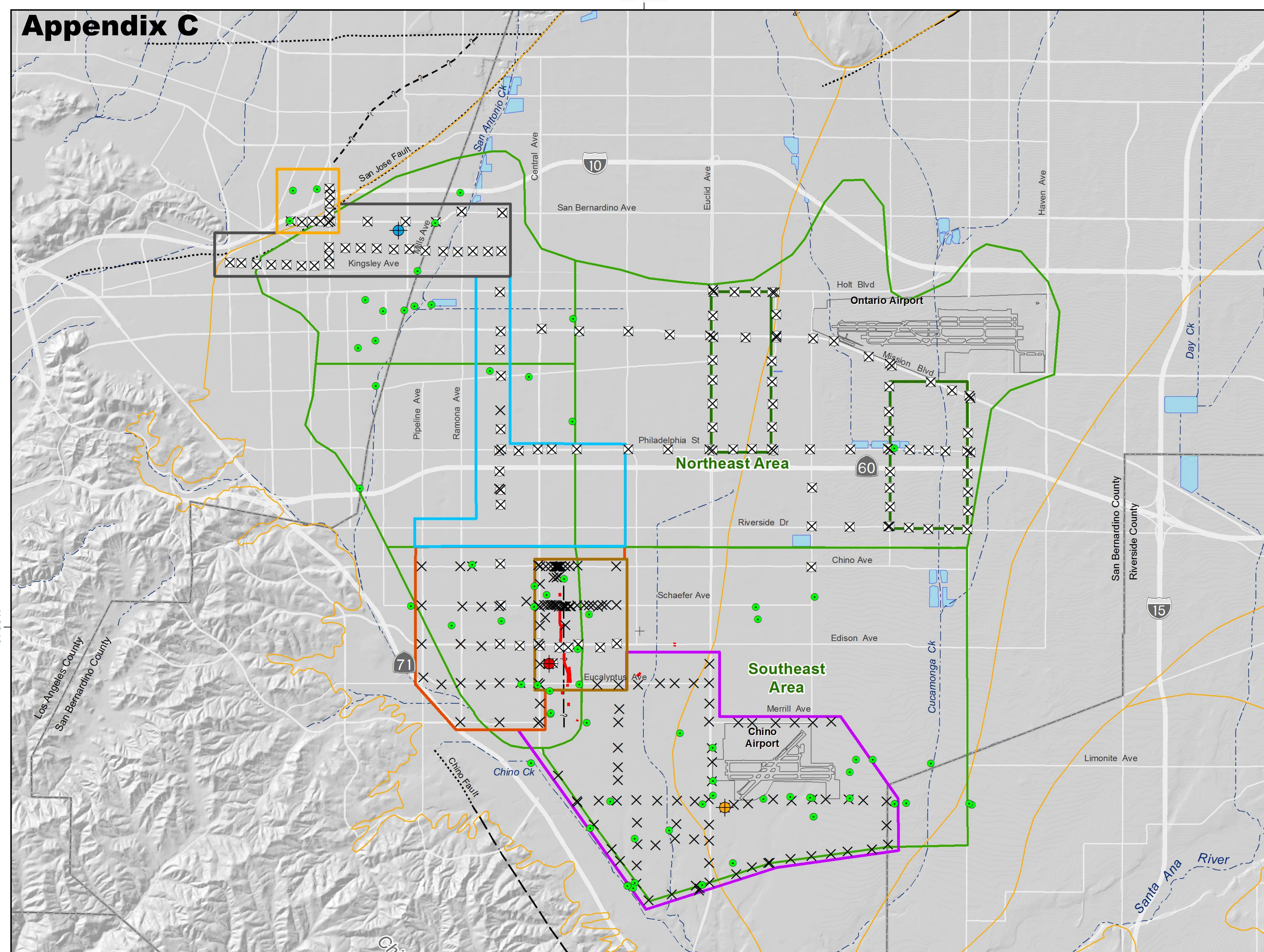
Author: SO
Date: 8/22/2019
File: Exhibit_L5_SW and Climate Mon

Prepared for:
OBMP 2020 Update
Scoping Report

Surface-Water and Climate Monitoring

Exhibit L-5

Appendix C



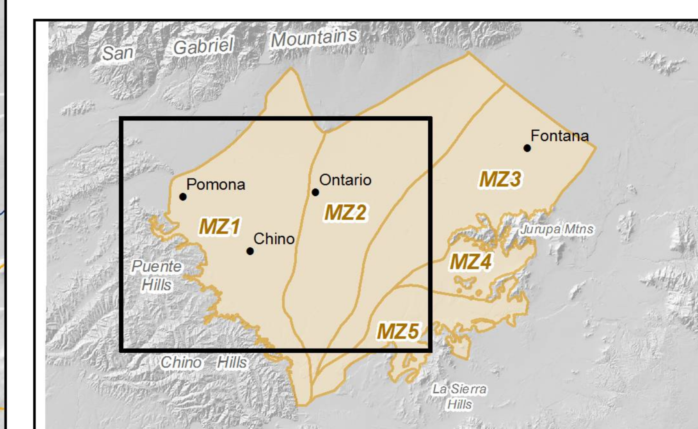
Ground-Level Monitoring Network Facilities

- Ayala Park Extensometer
- Chino Creek Extensometer
- Pomona Extensometer
- Well Equipped with Pressure Transducer (2018/19)
- Ground-Level Survey Benchmark
- Ground-Level Survey Benchmark (Measured in April 15, 2019)

Ground-Level Survey Areas

- Managed Area
- Fissure Zone Area
- Central Area
- Northwest Area
- San Jose Fault Zone Area
- Northeast Area
- Southeast Area

- Areas of Subsidence Concern
- Flood Control and Conservation Basins
- Fault (solid where accurately located; dashed where approximately located or inferred; dotted where concealed)
- Ground Fissures
- Approximate Location of the Riley Barrier



Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: NWS
Date: 8/22/2019
File: Exhibit_L6_Ground-Level Mon..mxd

0 1 2 3 4 5 Miles
0 2 4 6 8 Km

Prepared for:

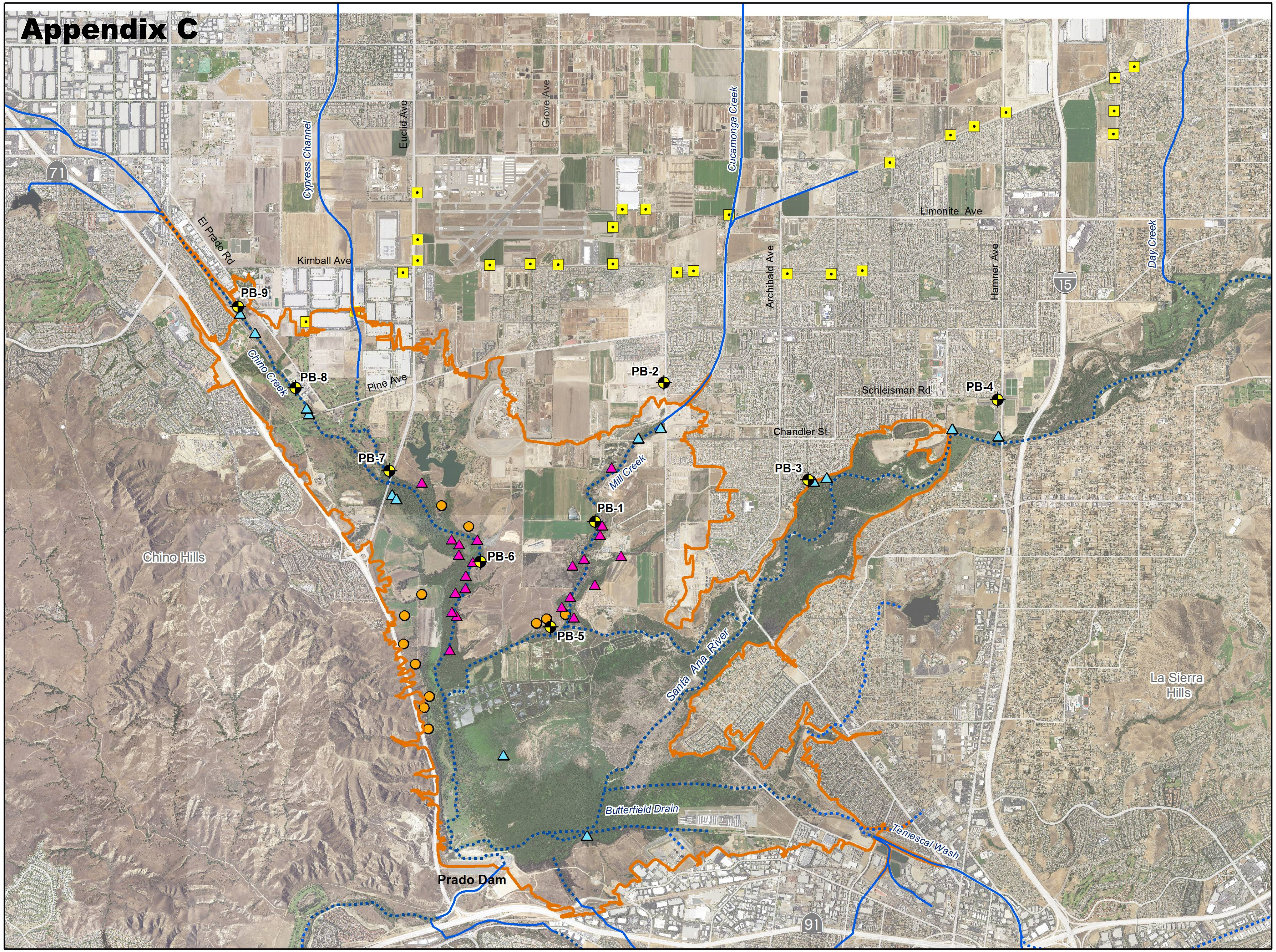
OBMP 2020 Update
Scoping Report

Chino Basin Watermaster

Ground-Level Monitoring Network
Western Chino Basin

Exhibit L-6

Appendix C



Riparian Habitat Monitoring Program

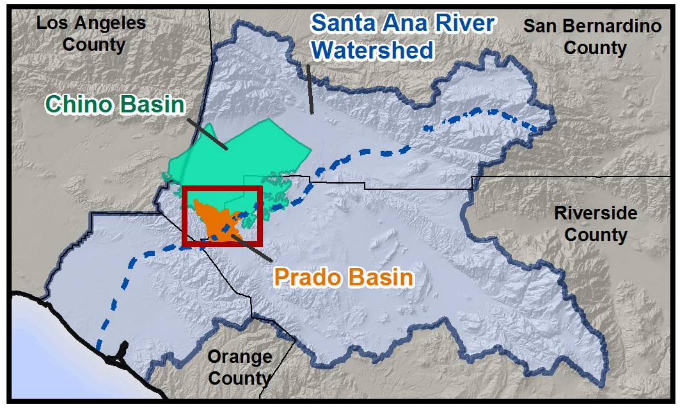
Site-Specific Monitoring

- USBR Vegetation Surveys 2007, 2013, and 2016
- USBR Vegetation Surveys 2016
- OCWD Photo Stations (2010 - 2016)

Regional Monitoring

- Prado Basin Management Zone (Prado Basin) - Area of Interest for Analysis of NDVI and Air Photos.
- Chino Basin Desalter Authority Well
- PBHSP Monitoring Well
- Concrete-Lined Channels
- Unlined Rivers and Streams

Aerial Photo: USDA, 2016. Mosaic of photos from June 2, 2016 to June14, 2016



Prepared by:

WEI
Wildermuth Environmental, Inc.

Author: SO
Date: 8/22/2019
File: Exhibit_L7_Bio. Monitoring

0 1 2 Miles
0 1 2 3 Km

Prepared for:
OBMP 2020 Update
Scoping Report

Biological Monitoring

Exhibit L-7

Appendix C

Exhibit L-8
Cost Estimate and Schedule to Implement Activity L

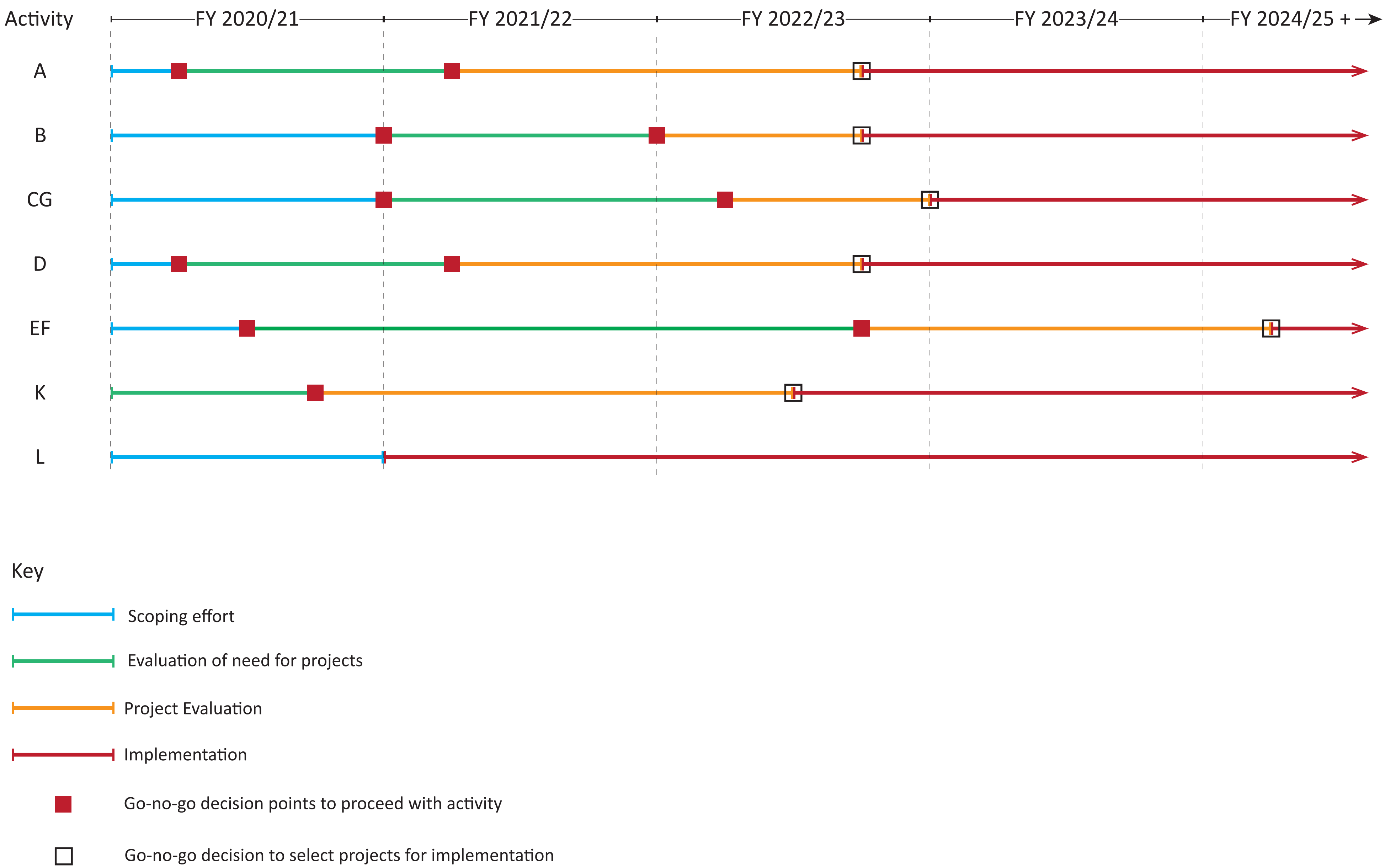
<table>
<tr><th rowspan="2">Task and Subtask Description</th><th rowspan="2">Engineering Cost</th><th colspan="4">FY 2020/21</th><th colspan="4">FY 2021/22</th><th colspan="4">FY 2022/23</th><th rowspan="2">FY 2023/24 and beyond</th></tr>
<tr><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th><th>Q1</th><th>Q2</th><th>Q3</th><th>Q4</th></tr>
<tr><td>Task 1 Convene Monitoring and Reporting Committee and prepare the Monitoring and Reporting Work Plan
· Convene Monitoring and Reporting Committee
· Conduct (5) meetings to prepare Work Plan and develop recommended revisions
· Prepare Monitoring and Reporting Work Plan
· Prepare memorandum: Recommended Revisions to Watermaster’s Non-Discretionary Monitoring and Reporting Programs</td><td>$125,000</td><td colspan="4">$60,000</td><td colspan="4">$65,000</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>Task 2 Implement Recommended Revisions to Watermaster’s Non-Discretionary Monitoring and Reporting Programs</td><td>$ TBD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="4">$ TBD</td><td>$ TBD</td></tr>
<tr><td>Task 3 Annual review of scope of work and cost to implement the Monitoring and Reporting Work Plan in the Subsequent Fiscal Year</td><td>$ TBD</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td colspan="4">$ TBD</td><td>$ TBD</td></tr>
<tr><td>Total Cost and Cost by FY</td><td>$125,000</td><td colspan="4">$60,000</td><td colspan="4">$65,000</td><td colspan="4"><b>$ TBD</td><td>$ TBD</td></tr>
</table>

TBD -- To be determined

Appendix C

Exhibit HIJ-1

Process and Schedule to Implement the OBMP Update Activities



Appendix A

A1. 2020 OBMP Update -- Listening Session #1 Memorandum

A2. 2020 OBMP Update -- Listening Session #2 Memorandum

A2. 2020 OBMP Update -- Listening Session #3 Memorandum

To: Chino Basin Watermaster Stakeholders
From: Watermaster 2020 OBMP Update Team
Subject: 2020 OBMP Update -- Listening Session #1 Memorandum
Date: February 5, 2019

The objectives of this memorandum are to summarize the information provided by the stakeholders during Listening Session #1 and provide information that will assist the stakeholders in reviewing the work products of Listening Session #1 and preparing for Listening Session #2.

Background

During 1998-2000, the Chino Basin Watermaster (Watermaster) conducted a process to develop the Chino Basin Optimum Basin Management Program (OBMP). The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders; described the physical state of the groundwater basin; developed a set of management goals; identified impediments to those goals; described a series of actions that could be taken to remove those impediments and achieve the management goals; developed and executed agreements to implement the OBMP; and certified a programmatic Environmental Impact Report (PEIR) pursuant to CEQA.

By 2019, many of the projects and management programs envisioned in the 2000 OBMP have been implemented, while some have not. The understanding of the hydrology and hydrogeology of the Chino Basin has improved since 2000, and new water-management issues have been identified that necessitate that the plan be adapted to protect the collective interests of the Chino Basin parties and their water supply reliability. For these reasons, the Watermaster parties are updating the 2000 OBMP (2020 OBMP Update) to set the framework for the next 20 to 30 years of basin-management activities.

The 2020 OBMP Update will be conducted using a collaborative process like that employed for the development of the 2000 OBMP. A description of the development of the 2000 OBMP and the rationale for and process to prepare the 2020 OBMP Update is included in a white paper prepared for the Chino Basin stakeholders: *White Paper – 2020 Update to Chino Basin Optimum Basin Management Program* (OBMP White Paper). The OBMP White Paper, and all documents relevant to the 2020 OBMP Update, are available on the Watermaster's ftp site.[1]

A series of eight public listening sessions are being held by the Watermaster throughout 2019 to support the 2020 OBMP Update. The purpose of the listening sessions is to obtain information and feedback from the parties and other Chino Basin stakeholders to define the collective goals of the parties, the impediments to achieving the goals, the management actions required to remove the impediments, and an implementation plan for the management actions. Watermaster staff will provide key information prior to and during each listening session to help the parties and other stakeholders provide their input on each topic discussed. The objective is for the ideas and opinions of every stakeholder to be heard. Participation in the listening sessions is critical to the development of the 2020 OBMP Update. Watermaster held Listening Session #1 on January 15, 2019.

Summary of Listening Session #1

Listening Session #1 was a four-hour workshop broken down into three main agenda topics:

[1] https://cbwm.syncedtool.com/shares/folder/9abb162877b999/?folder_id=670

- History of the 2000 OBMP
- Rationale for the 2020 OBMP Update – Drivers, Trends, and Implications (Breakout Session)
- Rationale for the 2020 OBMP Update – Issues, Needs, and Wants (Group Participation Session)

Prior to Listening Session #1 the following materials were distributed:

- Meeting agenda
- The OBMP White Paper
- An explanation of the assignment to prepare for Listening Session #1

These materials and a copy of the presentation given during Listening Session #1 are available on the Watermaster's ftp site.

History of the 2000 OBMP

The history of the 2000 OBMP and its implementation was provided by Watermaster staff and its legal, engineering, and environmental consultants. The presentation provided detail on why the OBMP was created; the process to develop it and the associated implementation agreements and environmental review documents; the OBMP Program Elements; and the progress and accomplishments in implementing each of the OBMP Program Elements, including a discussion on what was not accomplished.

Rationale for the 2020 OBMP Update – Drivers, Trends, and Implications

As described in the OBMP White Paper, the strategic drivers and trends that shaped the OBMP in the late 1990s have since changed. Exhibit 1 in the OBMP White Paper was a first attempt to summarize the current drivers and trends shaping water management, and their basin management implications for the Chino Basin parties. "Drivers" are external forces that cause changes in the Chino Basin water space. Grouped under each driver are expected trends that emanate from that driver. The relationship of the drivers/trends to the management implications are shown by arcs that connect trends to implications.

A breakout session was held to obtain input on the proposed drivers, trends and implications in Exhibit 1. The listening session attendees were divided into four groups to discuss changes and additions to the drivers, trends and implications. Each group documented its discussion and one member of each group reported out a summary of the group discussion to all attendees. The input provided by each breakout group was used to revise Exhibit 1 (attached to this memorandum). The following are the revised implications for Basin management that form a rationale for the 2020 OBMP Update:

- Reduced recycled water availability and increased cost
- Reduced imported water availability and increased cost
- Inability to pump groundwater with existing infrastructure
- Imported water quality degradation
- Chino Basin water quality degradation
- Increased cost of groundwater use
- Reductions in Chino Basin Safe Yield
- Recycled water quality degradation
- Increased cost of Basin Plan compliance

The final version of Exhibit 1 will be included as a final deliverable of the 2020 OBMP Update. Additional comments on Exhibit 1 can be submitted in writing to Edgar Tellez-Foster (etellezfoster@cbwm.org).

Rationale for the 2020 OBMP Update – Issues, Needs, and Wants

As described in the OBMP White Paper, the issues, needs and wants of the parties will form the basis of the management goals of the 2020 OBMP Update and inform the identification of impediments to the goals and action items to remove the impediments. A full group participation session was led by Watermaster staff to obtain feedback from the listening session attendees on their individual issues, needs and wants related to basin management. The listening session attendees articulated the issues, needs, and wants of their associated party in writing and then verbally shared with the full group. The feedback provided by the attendees was transcribed by Watermaster staff and then the needs and wants were organized into similar classes of issues. The classes of issues identified were effectively the same as the implications for basin management defined in Exhibit 1. Table 1 is a summary of the needs and wants of the parties, organized by the basin management issues. Attribution by party was assigned to each need and want.

Next Steps

The next steps in the process to develop the 2020 OBMP Update are:

1. Finalize the descriptions of issues, needs, and wants for basin management in Table 1.
2. Describe the goals for the 2020 OBMP Update, and impediments to achieving the goals.

OBMP Goals and Impediments

For the 2000 OBMP, the Chino Basin stakeholders established four management goals for the OBMP that addressed the issues, needs, and wants of the parties:

> ***Enhance Basin Water Supplies***. The intent of the goal was to increase the volumes and variety of available water supplies. This goal applied not only to local groundwater, but also to all sources of water available to the parties (*e.g.,* recycled, imported).
>
> ***Protect and Enhance Water Quality***. The intent of the goal was to ensure the protection of the long-term beneficial uses of the groundwater basin.
>
> ***Enhance Management of the Basin***. The intent of the goal was to encourage stable, creative, sustainable and fair water resources management for broad mutual benefit to all stakeholders and avoidance of undesirable results.
>
> ***Equitably Finance the OBMP***. The intent of the goal was to identify and use efficient and equitable methods to fund OBMP implementation.

While these general goals are as valid today as they were in 2000, it was apparent from the discussions of issues, needs, and wants at Listening Session #1 that the impediments to achieving the goals have changed and that the stakeholders have more focused goals for basin management. The focus of the next two listening sessions will be to identify the issues/needs/wants that are common to most stakeholders and to define focused goal statements and the impediments to achieving the goals. Listed below are four example goals, based on common issues/needs/wants, for the 2020 OBMP Update. Below each goal are some examples of the impediments to achieving the goals, and actions to remove the impediments. The impediments listed are not exhaustive.

Goal #1: Be able to rely on local supplies to meet potable demands for a [6, 12, 18, 24-month] period in the event of a [short-term, long-term] outage of imported water supply.

> **Impediments to achieving the goal**:
>
> - The current capacity to rely on groundwater during these periods is constrained by insufficient pumping capacity, insufficient conveyance, poor quality, and subsidence.
> - Exercising storage in the Chino Basin as a way of enhancing local water-supply reliability can cause undesirable results such as subsidence and loss of yield.

Actions to remove impediments and achieve the goal:

- Develop a Storage Management Plan (SMP) to define how to utilize storage without causing undesirable results.
- Build the production, conveyance and treatment facilities necessary to meet demands and operate in accordance with the SMP.

Goal #2: Avoid shutdown of groundwater production facilities due to existing or potential new water-quality regulations.

Impediment to achieving the goal: Insufficient treatment and brine disposal capacity.

Action to remove impediment and achieve the goal: Build conveyance and regional treatment facilities (with ability to expand, if necessary) to treat current and potential future contaminants of concern.

Goal #3: Optimize the use of unused storage space in the Basin by implementing storage and recovery programs.

Impediment to achieving the goal: Exercising storage in the Chino Basin can cause undesirable results such as subsidence and loss of yield.

Action to remove impediment and achieve the goal: Develop a Storage Management Plan (SMP) to define how to utilize storage without causing undesirable results.

Goal #4: Fund [X%] of the implementation of the OBMP Update with supplemental resources, such as grants, low-interest loans, or outside funding partners.

Impediment to achieving the goal: Competition for future grant funding will be fierce; success in obtaining grant funding is uncertain.

Recommended Preparation for Listening Session #2

1. Review the Issues, Needs, and Wants matrix in Table 1. Ensure that the feedback you reported at Listening Session #1 was accurately captured. Come to Listening Session #2 prepared to provide your feedback and add your party's attribution to the needs or wants identified by others, if you deem appropriate. The intent is to finalize Table 1 and use it to identify the specific concerns shared by most stakeholders. These common concerns will serve as that starting point for defining goals for the 2020 OBMP Update.
2. Based on your review of this memo and Table 1, come prepared to suggest and formulate goals for the 2020 OBMP Update and the impediments to achieving those goals.

Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ● Want **x** Unspecified

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others				
	Appropriative										Agricultural								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA	Overlying Non-Ag	IEUA	TVMWD	WMWD	Metropolitan	CBWCD
Reductions in Chino Basin Safe Yield																			
Manage the basin safe yield for the long-term viability and reliability of groundwater supply											🔴							x	
Develop an OBMP Update that is consistent with the Physical Solution and enables the Parties to leverage their respective water rights						x													
Maintain or enhance the safe yield of the basin without causing undesirable results				🔴	🔴					🔴	x				x				
Reassess the frequency of the safe yield recalculation					x												x		
Develop recharge programs that maintain or enhance safe yield																	x		
Design storage management and storage & recovery programs that maintain or enhance safe yield													🔴		●				
Engage with regional water management planning efforts in the Upper Santa Ana River Watershed that have the potential to impact Chino Basin operations or safe yield	x																x		
Develop more facilities to capture, store, and recharge stormwater	●	🔴									●								
Enhance recharge in northeast MZ-3			●																
Maximize use of existing recharge facilities	●																		
Establish incentives to encourage recharge of high-quality imported water			●																
Develop a storage management plan to optimize the use of unused storage space in the basin, avoid undesirable results, and encourage storage and recovery programs		🔴		🔴	🔴						🔴		●		x		🔴		

Appendix C

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	Appropriative										Agricultural								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA	Overlying Non-Ag	IEUA	TVMWD	WMWD	Metropolitan	CBWCD
Inability to Pump Groundwater with Existing Infrastructure																			
Design subsidence management plans to allow flexibility in the location and volume of groundwater production in MZ-1 and MZ-2	x					x	x			🔴					x				
Develop management strategies that enable the parties to produce or leverage their respective water rights that may be impacted by physical basin challenges like land subsidence or water quality						x	x												
Ensure that sufficient, reliable water supplies will be available to meet current and future water demands			🔴	🔴				🔴		x	x							🔴	●
Design storage management and storage & recovery programs to raise funding to build infrastructure															●				
Develop conjunctive use agreements that provide certainty in the ability to perform during put and take years by clearly defining facilities/infrastructure and operating plans, and that leverage the lessons learned from obstacles encountered during the implementation of the current Dry Year Yield program.	x																	x	
Develop process to support/facilitate project implementation																🔴			
Pursue collaborative, regional partnerships to implement regional solutions to water management challenges					●												●	●	🔴

Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ● Want x Unspecified

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others				
	Appropriative										Agricultural								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA	Overlying Non-Ag	IEUA	TVMWD	WMWD	Metropolitan	CBWCD
Increased Cost of Groundwater Use																			
Develop an equitable distribution of costs/benefits of the OBMP						x									x				
Watermaster assessments for implementation of the OBMP should be allocated based on benefits received					x														
Decrease Watermaster assessment costs	●				●														
Seek supplemental financial resources to support the implementation of the OBMP Update		🔴		●					🔴						x	🔴			●
Monetize agencies unused water rights for equitable balance of basin assets			●																
Support to develop a justification for increases in water rates and developer fees to invest in needed water infrastructure	🔴	x															x		
Develop regional partnerships to help reduce costs															●				
Continue or enhance incentives to pump groundwater from the Chino Basin			🔴																
Chino Basin Water Quality Degradation																			
Develop a water quality management plan to ensure ability to produce groundwater rights				x											x			x	
Address existing and new drinking water quality regulations that may result in an increase in groundwater treatment and costs	x	x	🔴					x									x		
Develop regional infrastructure to address water quality contamination and treatment					●														
Recycled Water Quality Degradation																			
Maintain compliance with recycled water and dilution requirements pursuant to the Chino Basin groundwater recharge permit															🔴				

Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ● Want **x** Unspecified

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others				
	Appropriative										Agricultural			Overlying Non-Ag					
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA	Overlying Non-Ag	IEUA	TVMWD	WMWD	Metropolitan	CBWCD
Increased Cost of Basin Plan Compliance																			
Perform the minimum amount of monitoring/reporting that is required for basin management and regulatory compliance							●												
Develop management strategy to ensure sufficient supplies to blend with recycled water and comply with Salt and Nutrient Management Plan											🔴								
Reduced Recycled Water Availability and Increased Cost																			
Maximize the use of recycled water for direct use or recharge	●			🔴					🔴						●				
Utilize non-IEUA sources of recycled water that are not being put to beneficial use	🔴								🔴										
Develop alternative management strategies to comply with the recycled water discharge obligations to the Santa Ana River															x		●		
Evaluate the potential for direct potable reuse of recycled water															●				
Fully utilize IEUA recycled water resources								🔴		🔴									
Reduced Imported Water Availability and Increased Cost																			
Increase water-supply reliability at the lowest possible cost								●											
Despite the best efforts of the Parties to decrease reliance on imported water, the cost of the total water supply continues to increase	x																		
Continue to build collaborative programs between the Metropolitan Water District and Chino Basin																		x	
Identify and utilize new sources of supplemental water															●				
Ensure that sufficient supplemental water supplies will be available to meet future replenishment requirements							x												

Appendix C

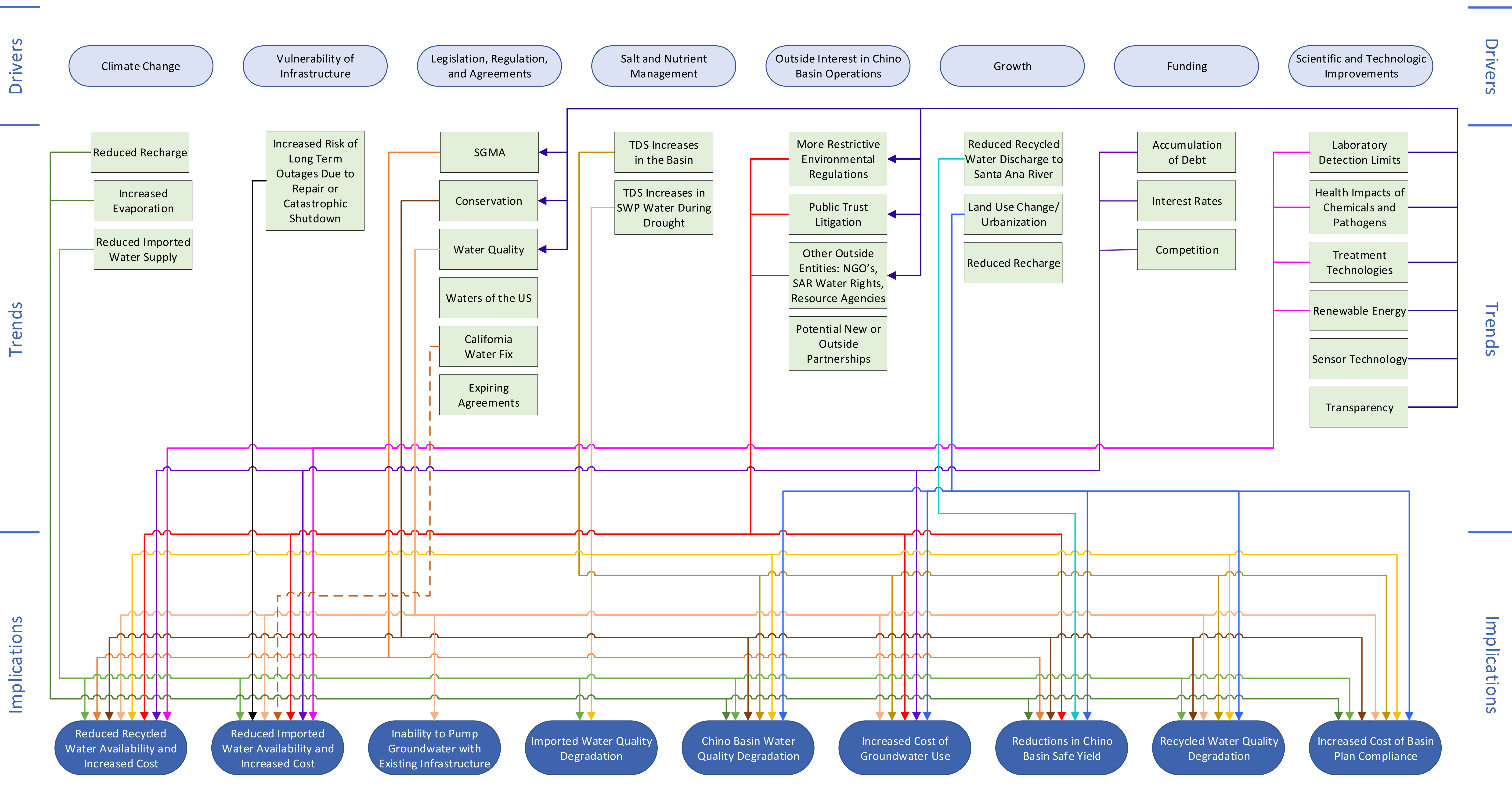
Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need • Want x Unspecified

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others				
	Appropriative										Agricultural			Overlying Non-Ag					
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD
Reduced Imported Water Availability and Increased Cost																			
Understand how imported water reliability from Metropolitan Water District will be affected with and without the California Water Fix															x				
Need a better understanding of the water management plans of the Parties to be able to better plan for imported water needs and to assure reliability of Metropolitan Water District water supply																		●	
Construct inter-basin and intra-basin connections for the benefit of regional water supply and conjunctive use		●		●				•							•		•	●	
Ensure that there is a reliable local water supply to replace imported water during shut down of imported water delivery infrastructure for maintenance and longer-term emergency outages	●		x	●			x	●	x						x			●	
Analyze water management scenarios that plan for unexpected challenges and emergencies															x				
Use more recycled water for replenishment obligation				●															
Develop management strategies that ensure parties will meet future desalter replenishment obligation and have the money to fund it				●													x		
Other																			
Improve communication between the parties	•																		
Coordinate timing of agreements, grants, etc. to ensure implementation of the OBMP Update															x				
Consider a long-term planning horizon of up to 50 years															•				
Educate elected officials and decision makers on the need and urgency to address the water management challenges		●																	

Appendix C

Exhibit 1 – Drivers and Trends and Their Implications
2020 OBMP Update



To: Chino Basin Watermaster Stakeholders
From: Watermaster 2020 OBMP Update Team
Subject: 2020 OBMP Update -- Listening Session #2 Memorandum
Date: March 14, 2019

The objectives of this memorandum are to summarize the information provided by the stakeholders during Listening Session #2 and provide information that will assist the stakeholders in reviewing the work products of Listening Session #2 and preparing for Listening Session #3.

Background

During 1998-2000, the Chino Basin Watermaster (Watermaster) conducted a process to develop the Chino Basin Optimum Basin Management Program (OBMP). The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders; described the physical state of the groundwater basin; developed a set of management goals; identified impediments to those goals; described a series of actions that could be taken to remove those impediments and achieve the management goals; developed and executed agreements to implement the OBMP; and certified a programmatic Environmental Impact Report (PEIR) pursuant to CEQA.

By 2019, many of the projects and management programs envisioned in the 2000 OBMP have been implemented, while some have not. The understanding of the hydrology and hydrogeology of the Chino Basin has improved since 2000, and new water-management issues have been identified that necessitate that the OBMP be updated to protect the collective interests of the Chino Basin stakeholders and their water supply reliability. For these reasons, the Watermaster parties are updating the 2000 OBMP (2020 OBMP Update) to set the framework for the next 20 to 30 years of basin-management activities.

The 2020 OBMP Update is being conducted using a collaborative process like that employed for the development of the 2000 OBMP. A description of the development of the 2000 OBMP and the rationale for and process to prepare the 2020 OBMP Update is included in a white paper prepared for the Chino Basin stakeholders: *White Paper – 2020 Update to Chino Basin Optimum Basin Management Program* (OBMP White Paper). The OBMP White Paper, and all documents relevant to the 2020 OBMP Update, are available on the Watermaster's ftp site.[1]

A series of public listening sessions are being held by the Watermaster throughout 2019 to support the 2020 OBMP Update. The purpose of the listening sessions is to obtain information, ideas, and feedback from the Chino Basin stakeholders to define their collective goals, the impediments to achieving the goals, the management actions required to remove the impediments, and an implementation plan for the management actions. Watermaster staff is providing key information prior to and during each listening session to enable the stakeholders to provide their input on each topic discussed. The objective is for the ideas and opinions of every stakeholder to be heard. Participation in the listening sessions is critical to the development of the 2020 OBMP Update.

Watermaster held Listening Session #2 on February 12, 2019. Prior to Listening Session #2, the *Listening Session #1 Memorandum* was distributed which summarized: the feedback received during Listening Session #1, how the feedback will be used for 2020 OBMP Update, and the recommended preparation for Listening Session #2.

[1] https://cbwm.syncedtool.com/shares/folder/9abb162877b999/?folder_id=670

Summary of Listening Session #2

Listening Session #2 was a three-hour workshop broken down into two main agenda topics:

- Update and refinement of the issues, needs, and wants of the Chino Basin stakeholders (individual breakout activity)
- Development of draft goals for the 2020 OBMP Update (group breakout session)

Update and refinement of the Issues, Needs, and Wants of the Chino Basin Stakeholders

As described in the OBMP White Paper, the issues, needs and wants of the stakeholders form the basis of the management goals of the 2020 OBMP Update and inform the identification of impediments to the goals and action items to remove the impediments. The issues, needs and wants were first discussed in Listening Session #1: the listening session attendees articulated the issues, needs, and wants of their associated party in writing and then verbally shared with the full group. Following Listening Session #1, the 167 individual issues, needs and wants provided by the attendees were transcribed by Watermaster staff and then combined into a list of 55 unique needs and wants. The needs and wants were then reviewed and categorized into nine classes of basin management issues:

- Reductions in Chino Basin Safe Yield
- Inability to pump groundwater with existing infrastructure
- Increased cost of groundwater use
- Chino Basin water quality degradation
- Recycled water quality degradation
- Increased cost of Basin Plan compliance
- Reduced recycled water availability and increased cost
- Reduced imported water availability and increased cost
- Other

A draft matrix was then developed to show attribution of the needs and wants by party/stakeholder. This matrix was circulated for review, editing, and comment as part of the *Listening Session #1 Memorandum*.

The OBMP Update Team gave a presentation to explain the process to develop the draft matrix and explained that the next step is to identify the needs and wants that are common to most stakeholders. These common needs and wants will serve as the starting point for defining goals for the 2020 OBMP Update. Following the presentation, the participants at Listening Session #2 were asked to circulate the room to review poster-sized versions of the matrix to: (1) confirm that attribution for their party's needs and wants were appropriately assigned, (2) revise the needs and want statements as needed to accurately describe their needs and wants, and (3) add their party's attribution to the needs and wants identified by others. Members participating by phone were asked to email their comments and input.

Table 1 (attached) is the revised matrix of the issues, needs and wants of the Chino Basin Stakeholders, inclusive of all feedback provided by stakeholders prior to, during, and following Listening Session #2. Additional edits to the matrix can be submitted via email to Edgar Tellez-Foster (etellezfoster@cbwm.org).

Discussion of Goals for the 2020 OBMP Update

The OBMP Update Team provided an overview of the goals of the 2000 OBMP, which were:

1. ***Enhance Basin Water Supplies***
2. ***Protect and Enhance Water Quality***
3. ***Enhance Management of the Basin***

4. ***Equitably Finance the OBMP***

These goals were based on the then-current issues, needs and wants of the Chino Basin stakeholders and included associated activities that would be needed to achieve the goals. Using a similar transparent process as is being employed now for the 2020 OMPU Update, the stakeholders defined the impediments to the goals and activities and the specific actions required to remove the impediments and achieve the goals. The actions were formed into the 2000 OBMP implementation plan.

During Listening Session #2, a group breakout session was held to obtain input on defining goals for the 2020 OBMP Update based on the issues, needs, and wants of the stakeholders. The meeting attendees were divided into six groups. Each group was assigned to one or multiple of the nine "basin management issues" and their associated needs and wants. Each group was asked to:

1. Identify the needs and wants that are common to most stakeholders.
2. Define one or more goals or activities for the 2020 OBMP Update to address the most common needs and wants.

Following the group breakout session, one member from each group reported on the group's discussions and ideas for goals and activities. Table 2 (attached) lists the stakeholder input presented by the breakout groups for goals and activities, categorized by basin management issues.

Proposed Goals for the 2020 OBMP Update

The feedback and input provided by the stakeholders during Listening Session #2 was used by The OBMP Update Team to develop proposed goals and their associated activities for the 2020 OBMP Update for review and discussion at Listening Session #3. The process followed to develop the proposed goals and activities included:

- An assessment of alignment of the stakeholder input in Tables 1 and 2 with the goals of the 2000 OBMP.
- An assessment of alignment of the basin management goals and activities in Table 2 with the needs and wants in Table 1.

The stakeholder input shown in Tables 1 and 2 indicates that the 2000 OBMP goals are still relevant today. To illustrate, Tables 1 and 2 each contain a column entitled "Alignment with 2000 OBMP Goal(s)." In both tables, the column indicates which of the four goals from the 2000 OBMP is in alignment with each line item of input provided, if applicable. Every need and want listed in Table 1 can be addressed through activities that are consistent with the 2000 OBMP goals. And, every activity described in Table 2 is in alignment with one or more of the 2000 OBMP goals. For this reason, we recommend that the goals for the 2020 OBMP Update are the same as the goals for the 2000 OBMP. While we propose that the goals for the 2020 OBMP Update are unchanged, the activities and implementation plan defined in 2000 need to be refined for the 2020 OBMP Update.

Our assessment of the stakeholder input for basin management goals and activities in Table 2 indicates that most of the issues, needs and wants described in Table 1 would be addressed by the activities. To illustrate, a column entitled "Addressed by Activities in Table 2" was added to Table 1. This column indicates which of the 17 activities listed in Table 2 have the potential to address each need and want. There are seven needs and wants in Table 1 that may not be addressed by the activities in Table 2 – additional activities may need to be considered to address these needs.

Based on our assessment, we propose the following set of goals and associated activities for the 2020 OBMP Update. For each goal, the following information is described: a statement of intent (relevant to

2000 and 2020), what has been accomplished to achieve the goal during the last 19 years of OBMP implementation, and a list of the proposed new or modified activities for to achieve the goals. The list of activities is based on the input in Table 2 (the number in parentheses following the activity description matches with the identification number shown in the first column the stakeholder input in Table 2).

Goal No. 1 - Enhance Basin Water Supplies. The intent of this goal is to increase available water supplies for all the stakeholders that rely on the Chino Basin and to improve supply reliability. This goal applies to Chino Basin groundwater, to other sources of water available to the OBMP stakeholders, and to the optimized use of Chino Basin storage to regulate the variability of the available water supplies and improve supply reliability.

Since the implementation of the 2000 OBMP, Watermaster and the OBMP stakeholders have completed or are currently implementing the following activities that enhance basin water supplies:

- constructed recharge projects to offset the stormwater recharge lost due to channel lining, increase Safe Yield, and ensure that there will be enough supplemental water recharge capacity to satisfy replenishment obligations;
- expanded the recharge and direct reuse of recycled water;
- constructed the Chino Basin desalters to recover contaminated groundwater in the southern part of the basin and to maintain the Safe Yield that would have otherwise been reduced due to the land use transition from agricultural to urban uses;
- recalculated the Safe Yield for the period 2011 through 2020; and
- started the process to recalculate the Safe Yield for 2021 through 2030.

The proposed new or modified activities to enhance basin water supplies to address the issues, needs and wants identified by the stakeholders in Listening Sessions 1 and 2 are based on the input in Table 2 and include:

- Construct new recharge facilities to increase the capacity for stormwater and recycled water recharge and provide recharge capacity in areas of the basin necessary to ensure long-term balance of recharge and discharge (1, 4 and 9).
- Develop and implement storage-and-recovery programs to increase water supply reliability, increase Safe Yield, and improve water quality (1, 2 and 3).
- Develop and implement regional conveyance and treatment programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence (7, 12 and 13).
- Maximize the reuse of recycled water produced by IEUA and others (10 and 11).

Goal No. 2 - Protect and Enhance Water Quality. The intent of this goal is to ensure the protection of the long-term beneficial uses of Chino Basin groundwater.

Since the implementation of the 2000 OBMP, Watermaster and the OBMP stakeholders have completed or are currently implementing the following activities to protect and enhance water quality:

- initiated a comprehensive basin-wide water-quality monitoring program;
- collaborated with the Regional Board in its efforts to facilitate the cleanup of groundwater contamination in the basin;
- developed an innovative salt and nutrient management plan to enable the use of recycled water that reduced treatment requirements without adversely impacting beneficial uses;
- constructed and operated the Chino Basin desalters to recover high-TDS and high-nitrate groundwater in the southern part of the basin and put it to beneficial use;

- identified opportunities to use the Chino Basin desalters to assist in the remediation of the Chino Airport and South Archibald plumes; and
- constructed new recharge facilities to enhance the recharge of high-quality storm and imported waters.

The proposed new or modified activities to protect and enhance water quality to address the issues, needs and wants identified by the stakeholders in Listening Sessions 1 and 2 are based on the input in Table 2 and include:

- Develop a water-quality management plan to address current and future water-quality issues and ensure the protection of beneficial uses, now and into the future (5).
- Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality (6).

Goal No. 3 - Enhance Management of the Basin. The intent of this goal is to encourage stable, creative, sustainable and fair water-resources management for broad mutual benefit to all stakeholders and avoid undesirable results.

Since the implementation of the 2000 OBMP, Watermaster and the OBMP stakeholders have completed or are currently implementing the following activities to enhance management of the basin:

- initiated a comprehensive basin-wide monitoring program for groundwater levels, recharge and land subsidence;
- developed a subsidence management plan to minimize or abate the occurrence of land subsidence and ground fissuring;
- implemented the OBMP storage management plan and more recently initiated the process to update it;
- developed methods to estimate storage losses;
- entered into the Dry-Year Yield program with Metropolitan; and
- became eligible for a $207 million grant to develop and implement a storage and recovery program.

The proposed new or modified activities to enhance management of the basin to address the issues, needs and wants identified by the stakeholders in Listening Sessions 1 and 2 are based on the input in Table 2 and include:

- Develop and implement storage-and-recovery programs that increase Safe Yield, improve water quality, and provide increased water supply reliability (1, 2, 3).
- Optimize the use of all sources of water supply by developing the ability to move water across the basin and between stakeholders (8 and 12).

Goal No. 4 - Equitably Finance the OBMP. The intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation.

Since 2000, Watermaster and the OBMP stakeholders have completed or are currently implementing the following activities to equitably finance the OBMP:

- completed the Peace Agreement, Peace II Agreement, and other agreements to provide incentives and funding plans to construct and operate the Chino Basin desalters and recharge improvements;

- entered into an agreement with Metropolitan for a Dry-Year Yield Program to store imported water and provided funding for the construction of new wells and wellhead treatment to produce degraded water when Metropolitan made a call for the water in storage; and
- obtained low-interest loans and grants to construct groundwater treatment, recycled water treatment, conveyance, and recharge facilities to enable the cost-efficient implementation of the OBMP.

The proposed new or modified activities to equitably finance the OBMP to address the issues, needs and wants identified by the stakeholders in Listening Sessions 1 and 2 are based on the input in Table 2 and include:

- Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements (14).
- Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement (16).
- Continue to identify and pursue low-interest loans and grants to support the implementation of the OBMP Update. An example of such an effort is the Chino Basin Project (15).

Next Steps

The next steps in the process to develop the 2020 OBMP Update are:

1. Obtain feedback on the proposal that the goals of the 2020 OBMP Update are the same goals defined in the 2000 OBMP but that continued progress toward these goals requires consideration of new or modified activities in an updated OBMP implementation plan.
2. For each goal, obtain feedback on the proposed list of activities for consideration in the development of the 2020 OBMP Update implementation plan.
3. Identify and describe the impediments to implementing the activities and achieving the goals.
4. Develop an initial set of actions to remove the impediments, including reconnaissance-level cost estimates, for consideration by the stakeholders.

Recommended Preparation for Listening Session #3

1. Review Table 1 and confirm that the feedback you provided at Listening Session #2 was accurately captured in the issues, needs and wants matrix. Please send any edits to Edgar Tellez-Foster (etellezfoster@cbwm.org).
2. Review the assessments of the nexus of the 2000 OBMP Goals with the needs and wants and activities in Tables 1 and 2; and the nexus of the activities in Table 2 to the needs and wants in Table 1. Be prepared to provide feedback (e.g. do the activities in Table 2 address all of the needs and wants? Are there any activities that could be added to the activities in Table 2?).
3. Review the proposed goal statements and associated new/modified activities for the 2020 OBMP Update. Be prepared to provide your feedback on these goals and activities. The intent is to (i) finalize the goals and (ii) have a complete list of potential new or modified activities for consideration as part the 2020 OBMP Update implementation plan.
4. Be prepared to identify impediments to implementing the goals and their associated activities.

Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ⚫ Want/Unspecified

*The number in this column matches with the identification number of the stakeholder input in Table 2 (first column)

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 2*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural											
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA	Overlying Non-Ag	IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Reductions in Chino Basin Safe Yield																						
Develop a storage management plan to optimize the use of unused storage space in the basin, avoid undesirable results, and encourage storage and recovery programs	🔴	🔴		🔴	🔴			🔴	🔴	🔴	🔴		⚫		🔴		🔴				1, 2	1, 2, 3
Design storage management and storage & recovery programs that maintain or enhance safe yield	🔴	⚫						🔴	🔴	⚫			🔴		⚫		⚫			⚫	2, 3	1, 3
Maintain or enhance the safe yield of the basin without causing undesirable results	🔴	⚫		🔴	🔴			🔴	🔴	🔴	⚫				⚫		⚫			🔴	2, 3	1, 3
Manage the basin safe yield for the long-term viability and reliability of groundwater supply	🔴	⚫						🔴	🔴	🔴	🔴			🔴			⚫	⚫		🔴	2, 3	1, 3
Reassess the frequency of the safe yield recalculation	⚫				⚫												⚫				2, 3	3
Continue to model and track safe yield, but utilize other management strategies to address a decline.																	⚫				2, 3	1, 3
Develop recharge programs that maintain or enhance safe yield	🔴	⚫					⚫	⚫	🔴	⚫					⚫		⚫			⚫	3, 4, 9	1, 3
Develop more facilities to capture, store, and recharge water	⚫	🔴					🔴			⚫	⚫				⚫		⚫				4, 9	1, 2
Enhance recharge in northeast MZ-3	⚫		⚫						🔴								⚫				4, 9	1, 3
Maximize use of existing recharge facilities	⚫	⚫							🔴	⚫											4, 9	3
Establish incentives to encourage recharge of high-quality imported water	⚫		⚫																		1, 4, 9	2, 3
Develop an OBMP Update that is consistent with the Physical Solution and allows access to the basin for users to meet their requirements	🔴	⚫				🔴		🔴														3
Engage with regional water management planning efforts in the Upper Santa Ana River Watershed that have the potential to impact Chino Basin operations or safe yield	⚫														🔴		⚫			🔴		3

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Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ● Want/Unspecified

*The number in this column matches with the identification number of the stakeholder input in Table 2 (first column)

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 2*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural			Overlying Non-Ag								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Inability to Pump Groundwater with Existing Infrastructure																						
Pursue collaborative, regional partnerships to implement regional solutions to water management challenges	●			●	●			●							🔴	●	●	●	🔴	🔴	6, 7,12 13,16	3
Ensure that sufficient, reliable water supplies will be available to meet current and future water demands	🔴	🔴	🔴	🔴			●	🔴	●	●	●				🔴	●	●	🔴	●		7, 9, 12, 13	1, 3
Develop conjunctive use agreements that provide certainty in the ability to perform during put and take years by clearly defining facilities/infrastructure and operating plans, and that leverage the lessons learned from obstacles encountered during the implementation of the current Dry Year Yield program	●						●		●						●		●	●			1, 2	1, 2, 3
Develop management strategies that enable the parties to produce or leverage their respective water rights that may be impacted by physical basin challenges like land subsidence or water quality	🔴						●	🔴							●		●				1, 2, 8, 13	3
Design storage management and storage & recovery programs to raise funding to build infrastructure	●			●											●		●				1, 15	3, 4
Develop process to support/facilitate project implementation	●																					4
Design subsidence management plans to allow flexibility in the location and volume of groundwater production in MZ-1 and MZ-2	●						●	🔴		🔴				●	●							3

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Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ● Want/Unspecified

*The number in this column matches with the identification number of the stakeholder input in Table 2 (first column)

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 2*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural			Overlying Non-Ag								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Increased Cost of Groundwater Use																						
Seek supplemental financial resources to support the implementation of the OBMP Update	🔴	🔴		●			●	🔴	🔴	●					●	🔴	●		●		15, 16	4
Develop regional partnerships to help reduce costs	●			●			●		🔴						🔴	●	●			●	15, 16	4
Monetize agencies' unused water rights for equitable balance of basin assets			●																		15, 16	4
Decrease Watermaster assessment costs	●				●			●													15, 16	4
Support to develop a justification for increases in water rates and developer fees to invest in needed water infrastructure	🔴	●							●								●				14, 15	
Develop an equitable distribution of costs/benefits of the OBMP	●	●		●		🔴	●	🔴	🔴	●				🔴	●						14	4
Watermaster assessments for implementation of the OBMP should be allocated based on benefits received	●				●																14	4
Continue or enhance incentives to pump groundwater from the Chino Basin			🔴																		1, 2, 12	3, 4
Improve flexibility for parties to execute water rights transfers														🔴								4

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Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

*The number in this column matches with the identification number of the stakeholder input in Table 2 (first column)

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 2*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural											
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Chino Basin Water Quality Degradation																						
Develop a water quality management plan to ensure ability to produce groundwater rights	● Need	● Want		● Want			● Want	● Want	● Want	● Want				● Need	● Want		● Want	● Want			5, 6	2, 3
Develop regional infrastructure to address water quality contamination and treatment				● Want	● Want			● Want													5, 6	2
Plan for and be prepared for new drinking water quality regulations that may result in an increase in groundwater treatment and costs	● Want	● Want	● Need	● Need			● Need	● Want	● Need	● Want					● Need		● Want				5, 6	2
Be more proactive and engaged in the process to develop new drinking water quality regulations								● Want													5, 6	2
Recycled Water Quality Degradation																						
Maintain compliance with recycled water and dilution requirements pursuant to the Chino Basin groundwater recharge permit		● Want					● Want		● Need	● Need				● Need	● Need						1, 6, 9	2
Increased Cost of Basin Plan Compliance																						
Develop management strategy to ensure sufficient supplies to blend with recycled water and comply with Salt and Nutrient Management Plan	● Want	● Want									● Need				● Want		● Want				1, 6, 9	2
Perform the minimum amount of monitoring/reporting that is required for basin management and regulatory compliance	● Want			● Want			● Want	● Want														3, 4

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Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: ● Need ● Want/Unspecified

*The number in this column matches with the identification number of the stakeholder input in Table 2 (first column)

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 2*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural			Overlying Non-Ag								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Reduced Recycled Water Availability and Increased Cost																						
Fully utilize IEUA recycled water resources		● Need		●			●	●		● Need					●						10	1
Maximize the use of recycled water for direct use or recharge	●	● Need		● Need			●	● Need	● Need	● Need					●						10, 11	1
Evaluate the potential for direct potable reuse of recycled water	●								●						●						10, 11	1
Develop alternative management strategies to comply with the recycled water discharge obligations to the Santa Ana River	●	●		●			●	●		●					●		●				10, 11	1, 3
Utilize non-IEUA sources of recycled water that are not being put to beneficial use	● Need	●					●	●	● Need	● Need					●		●				11	1
Other																						
Coordinate timing of agreements, grants, etc. to ensure implementation of the OBMP Update	●							●	● Need	●					●	●	●				17	
Improve communication between the parties	● Need			● Need										● Need	●		●				17	
Educate elected officials and decision makers on the need and urgency to address the water management challenges	●	● Need							● Need						●	●	●				17	
Consider a long-term planning horizon of up to 50 years	●								●	●					●							3

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Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ⚫ Want/Unspecified

*The number in this column matches with the identification number of the stakeholder input in Table 2 (first column)

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 2*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural											
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA	Overlying Non-Ag	IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Reduced Imported Water Availability and Increased Cost																						
Ensure that there is a reliable local water supply to replace imported water during shut down of imported water delivery infrastructure for maintenance and longer-term emergency outages	🔴	⚫	⚫	🔴			⚫	🔴	⚫	⚫					🔴	🔴	🔴	🔴			7, 12, 13	1, 3
Identify and utilize new sources of supplemental water	🔴	⚫		⚫			🔴	⚫	⚫	⚫					⚫	⚫	⚫				7, 8, 11, 13	1, 3
Construct inter-basin and intra-basin connections for the benefit of regional water supply and conjunctive use	⚫	⚫		🔴			⚫	⚫	🔴			🔴			⚫	🔴	⚫	🔴			7, 8	1, 3
Understand how imported water reliability from Metropolitan Water District will be affected with and without the California Water Fix	⚫								🔴						⚫	⚫	⚫				8, 13, 16	1, 3
Develop management strategies that ensure parties will meet future desalter replenishment obligation and have the money to fund it	⚫	⚫		🔴			🔴		⚫								⚫			🔴	8, 13, 14	3
Increase water-supply reliability at the lowest possible cost	🔴			⚫			⚫	⚫				🔴		🔴	⚫		⚫				8, 9, 13, 14	3
Need a better understanding of the water management plans of the Parties to be able to better plan for imported water needs and to assure reliability of Metropolitan Water District water supply	⚫			⚫					🔴			🔴			⚫	⚫	⚫	🔴			8, 9, 13	3
Analyze water management scenarios that plan for unexpected challenges and emergencies	⚫								🔴	⚫					⚫	⚫	⚫				8, 9, 13	3
Ensure that sufficient supplemental water supplies will be available to meet future replenishment requirements							⚫		🔴	⚫		🔴		?	⚫					🔴	7, 8, 9, 13	1, 3
Despite the best efforts of the Parties to decrease reliance on imported water, the cost of the total water supply continues to increase	⚫																				7, 8, 9, 15, 16	3
Use more recycled water for replenishment obligation	⚫			🔴			🔴		🔴								⚫				10,11	3
Continue to build collaborative programs between the Metropolitan Water District and Chino Basin	🔴						⚫	⚫	⚫						⚫		⚫	⚫			13, 16	3

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Appendix C

Table 2
Stakeholder Input on Goals and Activities for the 2020 OBMP Update

	Stakeholder Input by Basin Management Issue	Alignment with 2000 OBMP Goal(s)*
Reductions in Chino Basin Safe Yield		
1	Design storage and recovery programs that augment safe yield, improve water quality and enhance recharge	1, 2, 3
2	Optimize management of groundwater storage to enhance/protect safe yield	1, 3
3	Increase safe yield [by 10,000 af by 2030]	1
4	Capture and store all permitted water [by 2040]	1, 2
Chino Basin Water Quality Degradation		
5	Develop a water quality management plan [to address current and future water quality issues] to ensure ability to produce high-quality groundwater [by 2022]. (high quality = readily useable)	2
6	Develop strategic compliance solutions that achieve multiple benefits in managing water quality (OBMP Update, Built in)	2, 3
Reduced Imported Water Availability and Cost		
7	Increase wet-water supplies to meet parties' demands without the need of imported water from Metropolitan	1, 3
8	Optimize [efficient] use of all water supplies sources, with ability to move water across basins/amongst stakeholders	1, 3
9	Enhance ability to capture and store water when it is available [enough to satisfy imported water demands for 3 years (100 - 200k af)]	1, 2
Reduced Recycled Water Availability and Increased Cost		
10	Put 100% of IEUA recycled water to beneficial use in the Chino Basin [x% by 2025; x% by 2030]	1
11	Utilize available non-IEUA sources of recycled water for beneficial use in the Chino Basin [8,000 afy by 2025]	1
Inability to Pump Groundwater with Existing Infrastructure		
12	Leverage existing local infrastructure for the benefit of the region	3
13	Ensure sufficient, reliable water supplies (local, regional, imported) to meet future water demands, without MPI	1, 3
Increased Cost of Groundwater Use		
14	Develop an equitable distribution of costs/benefits of the OBMP and include in the OBMP Update agreements	4
15	Develop a plan to obtain supplemental financial resources to support the implementation of the OBMP Update	4
16	Develop regional partnerships to implement the OBMP Update and reduce costs -- (The "O" in OBMP); include in the OBMP update agreement	3, 4
Other		
17	Approve OBMP update with full support from all stakeholders and elected officials by June 2020	

*The 2000 OBMP Goals are:
(1) - Enhance basin water supplies
(2) - Protect and enhance water quality
(3) - Enhance management of the basin
(4) - Equitably finance the OBMP

To: Chino Basin Watermaster Stakeholders
From: Watermaster 2020 OBMP Update Team
Subject: 2020 OBMP Update -- Listening Session #3 Memorandum
Date: May 9, 2019

The objectives of this memorandum are to summarize the information provided by the stakeholders during Listening Session #3 and provide information that will assist the stakeholders in reviewing the work products of Listening Session #3 and preparing for Listening Session #4.

Background

During 1998-2000, the Chino Basin Watermaster (Watermaster) conducted a process to develop the Chino Basin Optimum Basin Management Program (OBMP). The OBMP was developed in a collaborative public process that identified the needs and wants of all stakeholders; described the physical state of the groundwater basin; developed a set of management goals; identified impediments to those goals; described a series of actions that could be taken to remove those impediments and achieve the management goals; developed and executed agreements to implement the OBMP; and certified a programmatic Environmental Impact Report (PEIR) pursuant to CEQA.

By 2019, many of the projects and management programs envisioned in the 2000 OBMP have been implemented, while some have not. The understanding of the hydrology and hydrogeology of the Chino Basin has improved since 2000, and new water-management issues have been identified that necessitate that the OBMP be updated to protect the collective interests of the Chino Basin stakeholders and their water supply reliability. For these reasons, the Watermaster parties are updating the 2000 OBMP (2020 OBMP Update) to set the framework for the next 20 to 30 years of basin-management activities.

The 2020 OBMP Update is being conducted using a collaborative process like that employed for the development of the 2000 OBMP. A description of the development of the 2000 OBMP and the rationale for and process to prepare the 2020 OBMP Update is included in a white paper prepared for the Chino Basin stakeholders: *White Paper – 2020 Update to Chino Basin Optimum Basin Management Program* (OBMP White Paper). The OBMP White Paper, and all documents relevant to the 2020 OBMP Update, are available on the Watermaster's ftp site.[1]

A series of public listening sessions are being held by the Watermaster throughout 2019 to support the 2020 OBMP Update. The purpose of the listening sessions is to obtain information, ideas, and feedback from the Chino Basin stakeholders to define their collective goals, the impediments to achieving the goals, the management actions required to remove the impediments, and an implementation plan for the management actions. Watermaster staff is providing key information prior to and during each listening session to enable the stakeholders to provide their input on each topic discussed. The objective is for the ideas and opinions of every stakeholder to be heard. Participation in the listening sessions is critical to the development of the 2020 OBMP Update.

Watermaster held Listening Session #3 on March 21, 2019. Prior to Listening Session #3, the *Listening Session #2 Memorandum* was distributed which summarized: the feedback received during Listening Session #2, how the feedback will be used for 2020 OBMP Update, and the recommended preparation for Listening Session #3. The PowerPoint presentation given at the meeting is available on the Watermaster's ftp site. [1]

[1] https://cbwm.syncedtool.com/shares/folder/9abb162877b999/?folder_id=670

Summary of Listening Session #3

Listening Session #3 was a three-hour workshop broken down into two main agenda topics:

- Discussion and feedback on the observation that the 2020 OBMP Update goals are the same as the 2000 OBMP goals
- Update and refinement of the types of activities that will be considered for inclusion in the 2020 OBMP Update

2020 OBMP goals

As discussed in the *Listening Session #2 Memorandum*, the stakeholder input provided in Listening Sessions #1 and #2 indicated that the goals defined in the 2000 OBMP are still relevant today. Based on the assessment of stakeholder input, the 2020 OBMP Update Team proposed maintaining the 2000 OBMP goals in the 2020 OBMP Update and drafted a statement of intent for each goal. During Listening Session #3, the 2020 OBMP Update Team gave a presentation to explain how the stakeholder input was used to conclude the goals remain the same and explained that the next step was to obtain feedback on these recommended goals and intents. The goals and intents presented during Listening Session #3 were:

> ***Goal No. 1 - Enhance Basin Water Supplies.*** The intent of this goal is to increase available water supplies for all the stakeholders that rely on the Chino Basin and to improve supply reliability.
>
> This goal applies to Chino Basin groundwater, to other sources of water available to the OBMP stakeholders, and to the optimized use of Chino Basin storage to regulate the variability of the available water supplies and improve supply reliability.
>
> ***Goal No. 2 - Protect and Enhance Water Quality.*** The intent of this goal is to ensure the protection of the long-term beneficial uses of Chino Basin groundwater.
>
> ***Goal No. 3 - Enhance Management of the Basin.*** The intent of this goal is to encourage stable, creative, sustainable and fair water resources management for broad mutual benefit to all stakeholders and avoidance of undesirable results.
>
> ***Goal No. 4 - Equitably Finance the OBMP***. The intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation.

Following the presentation, the participants at Listening Session #3 participated in a live web-supported survey on the goals and their intents. There was a total of five questions on the survey. For each of the four goals, the participants were presented the following question and multiple-choice answers:

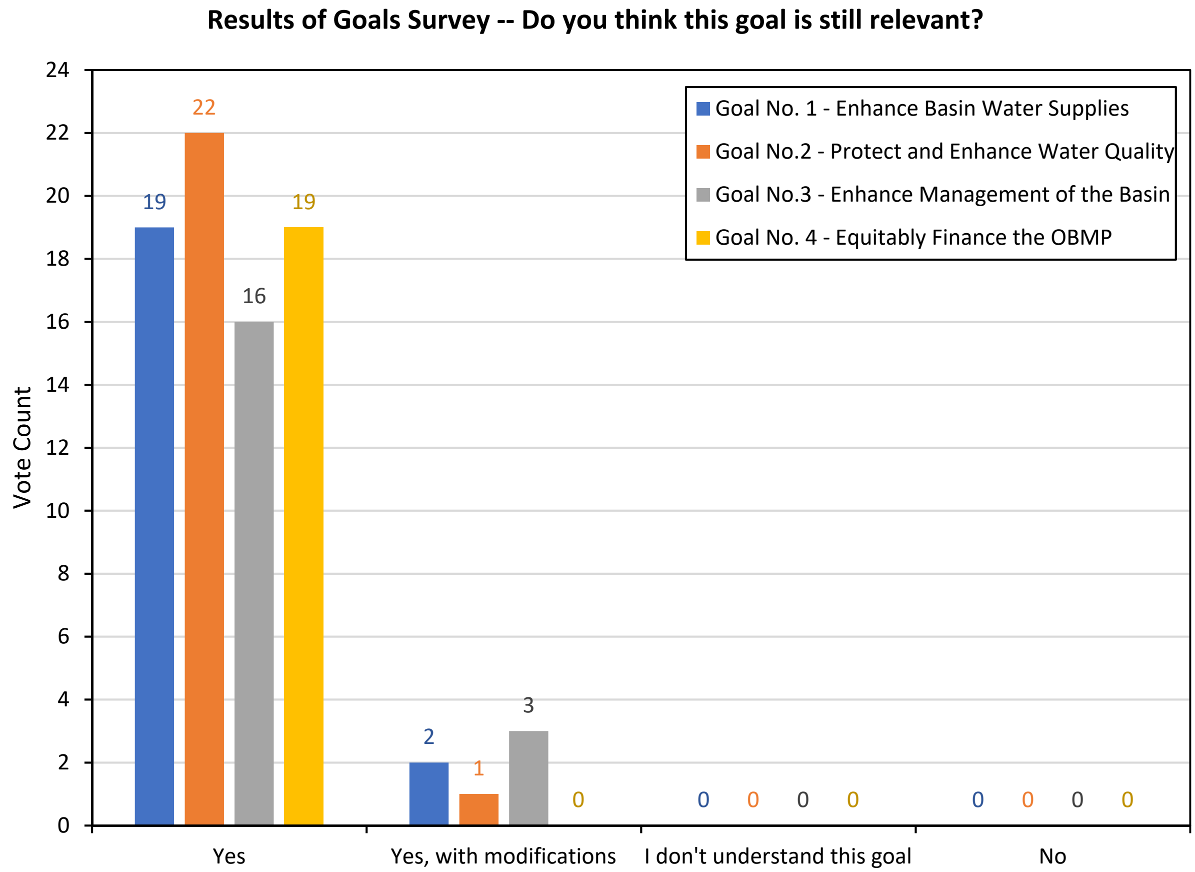
> Do you think this goal is still relevant?
>
> A) Yes B) Yes, with modifications C) No D) I don't understand this activity

The fifth survey question asked:

> Are there more goals that should be added?
>
> A) Yes B) No

Survey Results

The results of the survey for the first four questions are shown in the bar chart below.



As shown in the chart, all survey respondents indicated that the goals are still relevant today, and some respondents thought that Goals No. 1, 2 and 3 were still relevant but should be modified. The latter respondents were asked to explain their suggested modifications, resulting in a group discussion on the goal, the intent statement, and the respondents' concern. A summary of the discussion for each goal is summarized below:

Goal No. 1 - Enhance Basin Water Supplies. The meeting participants that spoke about potential modifications to Goal No. 1 voiced the following suggestions/concerns/questions:

- The goal could be construed as Watermaster attempting to manage water supplies outside Chino Basin groundwater, and therefore acting outside its purview.

Following explanation by two participants as to the consistency of the Watermaster's role in enhancing water supplies in the context of the Judgment and the 2000 OBMP, Watermaster legal counsel explained that Watermaster is responsible for ensuring that (1) the parties are able to meet their demands using Chino Basin groundwater and (2) sufficient water is available for replenishment if these demands result in overproduction; therefore, it is within Watermaster's purview to enhance water supplies outside Chino Basin groundwater. Another participant indicated that the implementation agreement will identify roles and responsibilities for implementing the OBMP activities and that through this agreement it could/will be made clear that Watermaster is not taking on a role that is beyond its purview.

- Should storage be listed as source of supply in the intent goal? It seems management of storage is a function of Goal No. 3.

There was no discussion about this question. Upon reflection and review of the 2000 OBMP, the OBMP Update Team agreed that storage was best highlighted as part of Goal No. 3 for consistency with the 2000 OBMP.

Goal No. 2 - Protect and Enhance Water Quality. The meeting participants who spoke about potential modifications to Goal No. 2 voiced the following suggestions/concerns/questions:

- Should the word "enhance" be added to the intent statement?

During the discussion, participants who spoke indicated that "enhance" was already explicitly used in the goal statement and it did not need to be added to the intent.

Goal No. 3 - Enhance Management of the Basin. The meeting participants who spoke about potential modifications to Goal No. 3 voiced the following suggestions/concerns/questions:

- The descriptors used in the intent statement, such as "fair" and "broad mutual benefit" were unclear and unnecessary.

During the discussion, the participants who spoke suggested: that words with imprecise meaning should not be used; that keeping the goals broader in scope by removing these qualifiers is the best approach; and that the specificity of "benefits" will be addressed in the activities or implementation plans.

Goal No. 4 - Equitably Finance the OBMP. The meeting participants who spoke about potential modifications to Goal No. 4 voiced the following suggestions/concerns/questions:

- Are the terms "efficient" and "equitable" in the intent statement at odds with each other? What is the definition of efficient?

The OBMP Update Team explained that an example of "efficient" method to fund OBMP implementation is partnering with IEUA to obtain grant funding to implement projects, and that this was done successfully in implementing the 2000 OBMP.

Consideration of Additional OBMP Goals. For the survey question regarding addition of new goals for the 2020 OBMP Update, two out of 19 survey respondents voted "Yes." The meeting participants who spoke offered the following input:

- Should we consider integrating the Sustainable Groundwater Management Act (SGMA) regulations with the 2020 OBMP Update goals?

  During the discussion, the participants who spoke suggested that Goal No. 3 is encompassing of the SGMA regulations, but that it may be helpful to include language about "maintaining local control" of the groundwater basin in the intent of Goal No. 3.

- Should there be a goal related to regional collaboration?

  During the discussion, the participants who spoke pointed out that regional collaboration is implied within Goals No. 1 and No. 3, so a separate goal is not needed.

- Participants also provided additional thoughts that should be considered by the stakeholders in the development of the 2020 OBMP Update, but not explicitly written as goals or intents of goals:

- o The OBMP Update activities should ensure Watermaster's engagement on issues related to the Santa Ana River, which is a significant source of supply to the Basin.
- o The participants should strive for collaboration and openness to avoid conflict.

Recommended 2020 OBMP Update goals

Based on the feedback from the goals survey during Listening Session #3, the recommended 2020 OBMP Update goals and intents are:

Goal No. 1 - Enhance Basin Water Supplies. The intent of this goal is to increase the water supplies available for Chino Basin parties and improve water supply reliability. This goal applies to Chino Basin groundwater and all other sources of water available for beneficial use.

Goal No.2 - Protect and Enhance Water Quality. The intent of this goal is to ensure the protection of the long-term beneficial uses of Chino Basin groundwater.

Goal No.3 - Enhance Management of the Basin. The intent of this goal is to encourage sustainable management of the Chino Basin to avoid material physical injury, promote local control, and improve water-supply reliability for the benefit of all Chino Basin parties.

Goal No. 4 - Equitably Finance the OBMP. The intent of this goal is to identify and use efficient and equitable methods to fund OBMP implementation.

2020 OBMP Update activities

During Listening Session #3, the meeting attendees participated in a breakout activity to review and provide feedback on the list of 10 new and revised activities for potential inclusion in the 2020 OBMP Update. The activities are shown in Table 2b, attached. These activities are based on the input provided by breakout groups during Listening Session #2, as documented in the Listening Session #2 memo. The Listening Session #3 participants were divided into six groups and each group was asked to:

1. Review a subset of the 10 activities (A through J) and suggest modifications to better address the needs and wants of the Chino Basin stakeholders, if necessary.
2. Review a subset of the issues, needs and wants (INWs) of the Chino Basin stakeholders to assess which of the ten activities address each need and want, and if any are not addressed by the activities, to suggest additional activities for consideration in the 2020 OBMP Update.

Table 1 shows the participants' assessment of which activities address each INW. Two new activities were defined by one of the breakout groups:

K. Develop a management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge.

L. Perform the appropriate amount of monitoring and reporting required for basin management and regulatory compliance.

The 2020 OBMP Update Team compiled the feedback from the breakout session and revised the list of activities for consideration in the 2020 OBMP Update. The revised list of activities was distributed to the Chino Basin stakeholders in the form of a survey to obtain additional feedback. The results of the survey and the complete list of activities is described below.

Follow-up survey on 2020 OBMP activities

The objective of this survey was to obtain feedback on the revised list of activities for consideration in the 2020 OBMP Update. For each activity, the survey asked:

(1) Do you think this activity should be considered for inclusion in the 2020 OBMP Update?

A) Yes B) Yes, with modifications C) No D) I don't understand this activity

(2) If you answered C or D, please explain

Based on the feedback from the survey as of May 3, 2019, six out of six survey respondents answered "A) Yes" for all activities except Activity F: *Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality.*

For Activity F, five out of six survey respondents thought that it should be included in the 2020 OBMP Update, and one participant responded that they did not understand the meaning of "strategic regulatory compliance solution." Based on the input provided by the parties, the 2020 OBMP Update Team's understanding of the scope of Activity F is to develop solutions to comply with evolving and more stringent drinking-water standards. Specifically, that the 2020 OBMP Update should explore regional, collaborative solutions that have the potential to address multiple water-quality and water-supply issues.

Based on the feedback from the survey as of May 3, 2019, the recommended list of activities is:

A. Construct new facilities and improve existing facilities to increase the capacity to store and recharge surface water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge

B. Develop, implement, and optimize storage-and-recovery programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality

C. Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence

D. Maximize the reuse of recycled water produced by IEUA and others

E. Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses

F. Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality

G. Optimize the use of all sources of water supply by improving the ability to move water across the basin and among stakeholders, prioritizing the use of existing infrastructure

H. Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements

I. Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement

J. Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update. An example of such an effort is the Chino Basin Project

K. Develop a management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge

L. Perform the appropriate amount of monitoring and reporting required for basin management and regulatory compliance

Nexus between the 2020 OBMP Update goals, their impediments, and the activities recommended for consideration

Thus far through the Listening Session process, the following has been completed:

- Defined the drivers, trends and implications for Basin management that identify the need for the 2020 OBMP Update (see attached Exhibit 1).
- Defined the needs and wants of the Chino Basin stakeholders, categorized by the Basin management issues derived from the drivers and trends analysis (see attached Table 1).
- Defined the goals of the 2020 OBMP Update, which are the same as the goals of the 2000 OBMP (refer to discussion above in this memo).
- Defined a set of activities for consideration in the 2020 OBMP Update that address the common needs and wants of the Chino Basin stakeholders (refer to discussion above in this memo).

There are physical, institutional, and financial impediments to achieving the goals of the 2020 OBMP. The issues, needs, and wants of the stakeholders shown in Table 1 explicitly recognize these impediments to achieving the goals and the stakeholders have identified the activities that could remove these impediments to achieve the goals.

Based on the feedback obtained from Listening Sessions #1 through #3, the 2020 OBMP Update Team drafted an exhibit to show the nexus of all this information. Table 3 lists the goals, the impediments to achieving these goals, the activities to remove the impediments, and the expected outcome or the implications of implementing those activities. Table 3 also shows the nexus of each activity to the Basin management issues defined in Exhibit 1. The statements of impediments and expected outcomes of the activities were developed by the 2020 OBMP Update Team and are based on the feedback obtained from stakeholders over the last three listening sessions.

Next Steps

The next step in the process to develop the 2020 OBMP Update is to (1) define the action plans required to perform the activities and (2) prepare reconnaissance-level engineering cost estimates of the action plans. This information will be documented in a technical memorandum (OBMP Update Technical Memorandum #1 [OBMP TM1]). OBMP TM1 will be circulated for review and subsequently refined and formulated into a recommended implementation plan (OBMP TM2) over a series of listening sessions with the stakeholders. The draft outline of OBMP TM1 and TM2 is attached herein.

Recommended Preparation for Listening Session #4

1. Review Table 3 and be prepared to provide feedback, specifically to suggest any changes or additions to the articulation of the impediments and expected outcomes of the 2020 OBMP Update activities. There will be a breakout session during Listening Session #4 to document all the feedback. The intent is to ensure that the feedback from the stakeholders over the last three Listening Sessions has been captured and is complete enough to prepare OBMP TM1.

2. Review the draft outline of OBMP TM1/TM2. The 2020 OBMP Update Team will provide an overview of the outline at Listening Session #4 and will provide an example of how the activities will be characterized in OBMP TM1.

Appendix C

Table 1

Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 3*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural			Overlying Non-Ag								
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA		IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Reductions in Chino Basin Safe Yield																						
Develop a storage management plan to optimize the use of unused storage space in the basin, avoid undesirable results, and encourage storage and recovery programs	🔴	🔴		🔴	🔴			🔴	🔴	🔴	🔴		●		🔴		🔴				B, C	1, 2, 3
Design storage management and storage & recovery programs that maintain or enhance safe yield	🔴	●						🔴	🔴	●			🔴		●		●			●	B, C	1, 3
Maintain or enhance the safe yield of the basin without causing undesirable results	🔴	●		🔴	🔴			🔴	🔴	🔴	●				●		●			🔴	B, D	1, 3
Manage the basin safe yield for the long-term viability and reliability of groundwater supply	🔴	●						🔴	🔴	🔴	🔴			🔴			●	●		🔴	A, B, C	1, 3
Reassess the frequency of the safe yield recalculation	●				●												●				I	3
Continue to model and track safe yield, but utilize other management strategies to address a decline.																	●				B	1, 3
Develop recharge programs that maintain or enhance safe yield	🔴	●					●	●	🔴	●					●		●			●	A, B	1, 3
Develop more facilities to capture, store, and recharge water	●	🔴					🔴			●	●				●		●				A, B, D	1, 2
Enhance recharge in northeast MZ-3	●		●						🔴								●				A, C	1, 3
Maximize use of existing recharge facilities	●	●						●	🔴	●											A, C, F, G	3
Establish incentives to encourage recharge of high-quality imported water	●		●																		H, I	2, 3
Develop an OBMP Update that is consistent with the Physical Solution and allows access to the basin for users to meet their requirements	🔴	●				🔴		🔴													C, E	3
Engage with regional water management planning efforts in the Upper Santa Ana River Watershed that have the potential to impact Chino Basin operations or safe yield	●														🔴		●			🔴	I, D	3

Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ⚫ Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 3*	Alignment with 2000 OBMP Goals
	Appropriative										Agricultural											
	Pomona	Chino	Fontana	CVWD	SAWCO	MVWD	Chino Hills	Upland	JCSD	Ontario	Crops	Dairy	State of CA	Overlying Non-Ag	IEUA	TVMWD	WMWD	Metropolitan	CBWCD	CDA		
Inability to Pump Groundwater with Existing Infrastructure																						
Pursue collaborative, regional partnerships to implement regional solutions to water management challenges	⚫			⚫	⚫			⚫							🔴	⚫	⚫	⚫	🔴	🔴	B, E, F, G, I	3
Ensure that sufficient, reliable water supplies will be available to meet current and future water demands	🔴	🔴	🔴	🔴			⚫	🔴	⚫	⚫	⚫				🔴	⚫	⚫	🔴	⚫		A, B, D, G	1, 3
Develop conjunctive use agreements that provide certainty in the ability to perform during put and take years by clearly defining facilities/infrastructure and operating plans, and that leverage the lessons learned from obstacles encountered during the implementation of the current Dry Year Yield program	⚫						⚫	⚫	⚫						⚫		⚫	⚫			B, G, I	1, 2, 3
Develop management strategies that enable the parties to produce or leverage their respective water rights that may be impacted by physical basin challenges like land subsidence or water quality	🔴						⚫	🔴							⚫		⚫				A, C, D, E, F, G, I	3
Design storage management and storage & recovery programs to raise funding to build infrastructure	⚫			⚫											⚫		⚫				B, D, I, J	3, 4
Develop process to support/facilitate project implementation	⚫																				F, H, J	4
Design subsidence management plans to allow flexibility in the location and volume of groundwater production in MZ-1 and MZ-2	⚫						⚫	🔴		🔴				⚫	⚫						A, C, G	3

Appendix C

Table 1

Issues, Needs and Wants of the Chino Basin Stakeholders

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Increased Cost of Groundwater Use																						
Seek supplemental financial resources to support the implementation of the OBMP Update	🔴	🔴		⚫			⚫	🔴	🔴	⚫					⚫	🔴	⚫		⚫		D, F, G, I, J	4
Develop regional partnerships to help reduce costs	⚫			⚫			⚫	⚫	🔴						🔴	⚫	⚫			⚫	F, G, I, J	4
Monetize agencies' unused water rights for equitable balance of basin assets			⚫																		G, H	4
Decrease Watermaster assessment costs	⚫				⚫			⚫													I, J	4
Support to develop a justification for increases in water rates and developer fees to invest in needed water infrastructure	🔴	⚫							⚫								⚫				F, G, H	
Develop an equitable distribution of costs/benefits of the OBMP	⚫	⚫		⚫		🔴	⚫	🔴	🔴	⚫				🔴	⚫						H, J	4
Watermaster assessments for implementation of the OBMP should be allocated based on benefits received	⚫				⚫																H	4
Continue or enhance incentives to pump groundwater from the Chino Basin			🔴																		G, I	3, 4
Improve flexibility for parties to execute water rights transfers														🔴							G, I	4

Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ⚫ Want/Unspecified

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Chino Basin Water Quality Degradation																						
Develop a water quality management plan to ensure ability to produce groundwater rights	🔴	⚫		⚫			⚫	⚫	⚫	⚫				🔴	⚫		⚫	⚫			E, F, G, J	2, 3
Develop regional infrastructure to address water quality contamination and treatment				⚫	⚫			⚫													A, B, C, E, F, G, I, J	2
Plan for and be prepared for new drinking water quality regulations that may result in an increase in groundwater treatment and costs	⚫	⚫	🔴	🔴			🔴	⚫	🔴	⚫					🔴		⚫				E, F	2
Be more proactive and engaged in the process to develop new drinking water quality regulations								⚫													A, B, D, E, G, J	2
Recycled Water Quality Degradation																						
Maintain compliance with recycled water and dilution requirements pursuant to the Chino Basin groundwater recharge permit		⚫					⚫	⚫	🔴	🔴				🔴	🔴						A, B, D, E, G, J	2
Increased Cost of Basin Plan Compliance																						
Develop management strategy to ensure sufficient supplies to blend with recycled water and comply with Salt and Nutrient Management Plan	⚫	⚫									🔴				⚫		⚫				G, K	2
Perform the minimum amount of monitoring/reporting that is required for basin management and regulatory compliance	⚫			⚫			⚫	⚫													L	3, 4

Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

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Reduced Recycled Water Availability and Increased Cost																						
Fully utilize IEUA recycled water resources		🔴		●			●	●		🔴					●						A, D, E, F, G	1
Maximize the use of recycled water for direct use or recharge	●	🔴		🔴			●	🔴	🔴	🔴					●						A, D, E, F, G	1
Evaluate the potential for direct potable reuse of recycled water	●								●						●						D, E, F	1
Develop alternative management strategies to comply with the recycled water discharge obligations to the Santa Ana River	●	●		●			●	●		●					●		●				D, E, F	1, 3
Utilize non-IEUA sources of recycled water that are not being put to beneficial use	🔴	●					●	●	🔴	🔴					●		●				D, E, F	1
Other																						
Coordinate timing of agreements, grants, etc. to ensure implementation of the OBMP Update	●							●	🔴	●					●	●	●				F, G, H, I, J	
Improve communication between the parties	🔴			🔴				●						🔴	●		●				F, H, I	
Educate elected officials and decision makers on the need and urgency to address the water management challenges	●	🔴							🔴						●	●	●				F, G, H, I, J	
Consider a long-term planning horizon of up to 50 years	●								●	●					●						F, G, H, I, J	3

Appendix C

Table 1
Issues, Needs and Wants of the Chino Basin Stakeholders

Key: 🔴 Need ● Want/Unspecified

*The letter in this column corresponds with the letter ID of the Activities listed in Table 3

Needs and Wants Categorized by Basin Management Issues	Pool Parties														Others						Addressed by Activities in Table 3*	Alignment with 2000 OBMP Goals
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Reduced Imported Water Availability and Increased Cost																						
Ensure that there is a reliable local water supply to replace imported water during shut down of imported water delivery infrastructure for maintenance and longer-term emergency outages	🔴	●	●	🔴			●	🔴	●	●					🔴	🔴	🔴	🔴			B, C, G	1, 3
Identify and utilize new sources of supplemental water	🔴	●		●			🔴	●	●	●					●	●	●				A, B	1, 3
Construct inter-basin and intra-basin connections for the benefit of regional water supply and conjunctive use	●	●		🔴			●	●	🔴			🔴			●	🔴	●	🔴			C, G	1, 3
Understand how imported water reliability from Metropolitan Water District will be affected with and without the California Water Fix	●							●	🔴						●	●	●				-	1, 3
Develop management strategies that ensure parties will meet future desalter replenishment obligation and have the money to fund it	●	●		🔴			🔴		●								●			🔴	H, I, J	3
Increase water-supply reliability at the lowest possible cost	🔴			●			●	●				🔴		🔴	●		●				A, B, D, J	3
Need a better understanding of the water management plans of the Parties to be able to better plan for imported water needs and to assure reliability of Metropolitan Water District water supply	●			●					🔴			🔴			●	●	●	🔴			A	3
Analyze water management scenarios that plan for unexpected challenges and emergencies	●							●	🔴	●					●	●	●				E, G	3
Ensure that sufficient supplemental water supplies will be available to meet future replenishment requirements							●		🔴	●		🔴		?	●					🔴	A	1, 3
Despite the best efforts of the Parties to decrease reliance on imported water, the cost of the total water supply continues to increase	●																				-	3
Use more recycled water for replenishment obligation	●			🔴			🔴		🔴								●				A, D, E, F	3
Continue to build collaborative programs between the Metropolitan Water District and Chino Basin	🔴						●	●	●						●		●	●			B, I	3

Appendix C

Table 2b
Draft Activities for Consideration in the 2020 OBMP Update,
Derived from the Activities Defined by Stakeholders in Listening Session #2**

ID	Activity
A	Construct new recharge facilities to increase the capacity for stormwater and recycled water recharge and provide recharge capacity in areas of the basin necessary to ensure long-term balance of recharge and discharge.
B	Develop and implement storage-and-recovery programs to increase water supply reliability, increase Safe Yield, and improve water quality.
C	Develop and implement regional conveyance and treatment programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence.
D	Maximize the reuse of recycled water produced by IEUA and others.
E	Develop a water-quality management plan to address current and future water-quality issues and ensure the protection of beneficial uses, now and into the future.
F	Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality.
G	Optimize the use of all sources of water supply by developing the ability to move water across the basin and between stakeholders.
H	Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements.
I	Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement.
J	Continue to identify and pursue low-interest loans and grants to support the implementation of the OBMP Update. An example of such an effort is the Chino Basin Project.

***Note: See Table 2 of Listening Session #2 Memo*

Appendix C

Table 3
OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
			Reductions in Chino Basin Safe Yield	Inability to Pump Groundwater with Existing Infrastructure	Increased Cost of Groundwater Use	Chino Basin Water Quality Degradation	Recycled Water Quality Degradation	Increased Cost of Basin Plan Compliance	Reduced Recycled Water Availability and Increased Cost	Reduced Imported Water Availability and Increased Cost
Goal 1 - Enhance Basin Water Supplies										
1a • Not all of the stormwater runoff available to the Chino Basin is diverted and recharged. Failure to divert and recharge stormwater is a permanently lost opportunity. • The existing methodology to select recharge projects for implementation is based on the cost of imported water. There are currently no known projects with a unit cost lower than the cost of imported water, hindering expansion of stormwater capture and recharge • Pumping capacity in some areas of the basin is limited due to low groundwater levels and land subsidence.	A Construct new facilities and improve existing facilities to increase the capacity to store and recharge surface water, particularly in areas of the basin that will promote the long-term balance of recharge and discharge	• Increases recharge of high-quality stormwater that will: • protect/enhance the Safe Yield, • improve water quality, • reduce dependence on imported water, • increase pumping capacity in areas of low groundwater levels and areas of subsidence concern, and • provide new supply of blending water to support the recycled-water recharge program. • Provides additional supplemental-water recharge capacity for replenishment and implementation of storage and recovery programs. • Provides additional surface water storage capacity.	✓	✓	✓	✓	✓	✓		✓
1b • There is a surplus of recycled water available to the Chino Basin parties that is not being put to beneficial use, which is a loss of a low-cost, local water supply. • Existing infrastructure limits the reuse and recharge of recycled water in the Chino Basin. • Existing requirements to discharge recycled water to the Santa Ana River limit the amount of water available for reuse and recharge	D Maximize the reuse of recycled water produced by IEUA and others	• Results in a new, consistent volume of in-lieu and/or wet water recharge that will: • protect/enhance the Safe Yield, • reduce dependence on imported water, • improve water-supply reliability, especially during dry periods, and • increase pumping capacity in areas of low groundwater levels and areas of subsidence concern.	✓	✓					✓	✓

Appendix C

Table 3
OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

	Impediments		Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
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Goal 2 - Protect and Enhance Water Quality												
2a	• Areas of the basin are contaminated with VOCs and constituents of emerging constituents (CECs). • Water-quality regulations are evolving and becoming more restrictive, which limits the beneficial uses of groundwater. • Groundwater treatment may be necessary to meet beneficial uses, but can be expensive to build and operate. • The basin is hydrologically closed, which causes accumulation and concentration of salts, nutrients, and other contaminants. • Some stored water in the Chino Basin cannot be used due to water quality and insufficient treatment capacity	E F	Develop and implement a water-quality management plan to address current and future water-quality issues and protect beneficial uses Develop strategic regulatory-compliance solutions that achieve multiple benefits in managing water quality	• Proactively addresses new and near-future regulations. • Enables the parties to make informed decisions on infrastructure improvements for water-quality management. • Removes groundwater contaminants from the Chino Basin and thereby improves groundwater quality. • Enables the parties to produce or leverage their water rights that may be constrained by water quality. • Ensures that groundwater is pumped and thereby protects/enhances the Safe Yield.	✓	✓	✓	✓				✓
2b	• Water-quality regulations are evolving and generally becoming more stringent, which could limit the reuse and recharge of recycled water.	K	Develop management strategy within the Salt and Nutrient Management Plan to ensure ability to comply with dilution requirements for recycled water recharge	• Enables the continued and expanded recharge of recycled water, which will: • protect water quality, • improve water-supply reliability, especially during dry periods, and • protect/enhance the Safe Yield.	✓			✓	✓	✓		✓

Appendix C

Table 3
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Impediments	Activities to Remove Impediments	Potential Outcomes of Activities	Issues, Needs and Wants, as Categorized by Basin Management Issues, that are Addressed by Activities							
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Goal 3 - Enhance Management of the Basin										
3a • Existing infrastructure (pumping and treatment capacity and conveyance) is insufficient to conduct puts and takes under proposed storage programs. • There is unused storage space in the Basin the use of which is constrained by the storage limits defined in existing CEQA documentation. • Watermaster's current storage management plan is not optimized to protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain hydraulic control, etc.	B Develop, implement, and optimize storage-and-recovery programs to increase water-supply reliability, protect or enhance Safe Yield, and improve water quality.	• Storage programs that protect/enhance basin yield, improve water quality, avoid new land subsidence, ensure balance of recharge and discharge, maintain hydraulic control, etc. • Leverages unused storage space in the Basin. • Reduces reliance on imported water, especially during dry periods. • Potentially provides outside funding sources to implement the OBMP Update. • Improves water quality through the recharge of high quality water.	✓	✓	✓	✓				✓

Appendix C

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3b • Land subsidence in northwest MZ1 may limit the ability for parties to pump their respective rights in this area. • Poor water quality and increasingly restricting water quality regulations limits the ability for some parties to pump their respective rights.	C Identify and implement regional conveyance and treatment projects/programs to enable all stakeholders to exercise their pumping rights and minimize land subsidence. G Optimize the use of all sources of water supply by improving the ability to move water across the basin and amongst stakeholders, prioritizing the use of existing infrastructure.	• Enables producers in MZ1 to obtain water through regional conveyance, which supports management of groundwater levels to reduce the potential for subsidence and ground fissuring. • Enables the parties to increase production in areas currently constrained by poor water quality. • Removes groundwater contaminants from the Chino Basin and thereby improves water quality. • Protects/enhances the Safe Yield. • Maximizes the use of existing infrastructure, which will minimize costs. • Provides infrastructure that can also be used to implement storage and recovery programs.	✓	✓	✓	✓				✓
3d • Watermaster needs information to comply with regulations and its obligations under its agreements and Court orders, yet financial resources to collect this information are limited.	L Perform the appropriate amount of monitoring and reporting required for basin management and regulatory compliance	• Ensures full compliance with regulatory requirements. • Ensures full support of basin management initiatives. • Enables parties to monitor the performance of the OBMP Update.	✓	✓	✓	✓	✓	✓	✓	✓

Appendix C

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OBMP Update Goals, Impediments to the Goals, Activities to Remove the Impediments, Expected Outcomes of Activities, and Nexus to Addressing the Issues Needs and Wants of the Stakeholders

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Goal 4 - Equitably Finance the OBMP										
4a • The distribution of benefits associated with the OBMP Update is not defined. • Funding needed for the OBMP implementation activities of the Watermaster is not projected beyond the current year budget, which limits parties ability to plan required funding for the future. • There is currently no formal process to evaluate and adapt the OBMP implementation plan, schedule and cost.	H Develop an equitable distribution of costs/benefits of the OBMP Update and include in the OBMP update agreements.	• Provides transparency as to the benefits of the OBMP Update activities. • Provides information needed to plan financial resources. • Improves the likelihood that the OBMP will be implemented.			✓					
4b • Limited financial resources constraint the implementation of the OBMP.	I Develop regional partnerships to implement the OBMP Update and reduce costs and include in OBMP Update agreement	• Lowers the cost of OBMP implementation. • Improves the likelihood that the OBMP will be implemented.			✓					
	J Continue to identify and pursue low-interest loans and grants or other external funding sources to support the implementation of the OBMP Update. An example of such an effort is the Chino Basin Project.				✓					

Appendix B

Response to Comments

Scoping Report Comments[1]

City of Chino – Comments on Scoping Report Part 1 Provided by Dave Crosley

1. ***Page 12, last paragraph, 1st sentence ends with a reference to footnote "3" which seems misplaced.***

   The reference to footnote 3 has been removed.

2. ***Page 31, Activity D. The described scope pertaining to Activity D could be reshaped to reflect a reduced level of effort by Watermaster.***

   The objectives of Activity D are to maximize recycled water reuse. As described in the Scoping Report, the IEUA would be the appropriate entity to lead the implementation of Activity D on behalf of all parties in the IEUA, TVMWD, and WMWD service areas. The draft report suggested that part of Watermaster's role would be to convene and lead a committee that could guide the process, however such a role is not required to implement the activity. Watermaster's role could be to team with the IEUA or other coordinating agency in the implementation of Activity D to ensuring its implementation is consistent with the Judgment, the Peace Agreements and other agreements, the maximum benefit SNMP, and the Watermaster Rules and Regulations. Specifically, Watermaster should ensure that the process to maximize recycled water is integrated with the goals of the OBMP and that the process includes projects to maximize the use of recycled water for replenishment purposes (Judgment ¶ 49(a)). Accordingly, the text has been modified to reflect this revised role. Note that this is consistent with the 2000 OBMP Implementation Plan for Program Element 5 - *Develop and Implement Regional Supplemental Water Program* in the 2000 OBMP, for which IEUA was the agency responsible for implementation of expanded recycled water reuse. The revised text can be found on page 36 of the final report.

3. ***Page 25, last paragraph, 3rd sentence states "[T]he recent decline in the direct use of recycled water is a result of reduced water use due to drought and state-mandated water conservation programs that required significant reductions in water use." What data supports this statement? The last sentence of the preceding paragraph describes conservation-related causation of reduced recycled water availability, but just because there is a reduced supply it does not necessarily follow that conservation caused less recycled water demand. We suggest clarification.***

   The text has been updated per discussions with the IEUA. Per the IEUA, the recent decline is due to the mindful reduction in use by the City of Chino to accommodate changes in IEUA policy related to the use of recycled water base entitlements and conversions of land from agricultural to urban uses. The new text appears on page 31, fourth full paragraph, third sentence.

4. ***Page 26, 2nd paragraph, 1st sentence states "…the IEUA is maximizing the reuse of recycled water given the constraint of meeting its obligations to discharge a minimum of 17,000 AFY to***

[1] Comments and questions about the OBMP process were addressed in a separate document that is available on Watermaster's website at: http://www.cbwm.org/docs/OBMP%20Update/20191017%20Watermaster%20Responses%20to%20comments%20on%20Process.pdf.

comply with the Santa Ana River Judgment and associated agreements with WMWD." This statement is misleading, as the IEUA discharge of recycled water to the river has generally exceeded the minimum 17,000 AFY flow requirement instead of directing excess supplies of recycled water to satisfy significant potential direct reuse demands throughout the IEUA service area. The 4th paragraph appearing on page 27 describes some of the circumstances that contribute to the challenge of maximizing reuse.

The text of this paragraph has been updated to more clearly articulate the challenge that the availability of recycled water poses for IEUA in meeting its obligations of the Santa Ana River Judgment, specifically that the increasing demand for recycled water for reuse will constrain the IEUA's ability to continue to use recycled water to meet its discharge obligations. The revised text is on page 34, first full paragraph of the final Scoping Report.

5. ***Page 28, 3rd full paragraph under the subheading Santa Ana River Judgment states "… discharge requirements of the Judgment preclude the IEUA from reusing 100 percent of its recycled water supply." This is an oversimplified and misleading characterization of the Judgment requirement. The subject Judgment (OC Judgment) describes an obligation of entities located upstream of Prado to provide for a minimum flow of water to downstream of Prado. IEUA and WMWD, as upstream entities, have a joint obligation. IEUA has utilized unclaimed recycled water produced via the treatment of wastewater generated within the service areas of its members in order to satisfy its share of the joint IEUA/WMWD obligation. However, the minimum flow need not necessarily be supplied from recycled water generated from wastewater treatment, and the agencies within whose jurisdictions the wastewater is generated possess a contractual entitlement to the recycled water. If those agencies claim their entitlement then IEUA, as a regional (Chino Basin) water supply agency (not a wastewater treatment service provider), still has a joint (along with WMWD) obligation to provide a minimum flow downstream of Prado. The OC Judgment does not preclude the recycled water entitlement holders from using 100 percent of the recycled water.***

   The text of this paragraph has been updated to eliminate the statement that "… discharge requirements of the Judgment preclude the IEUA from reusing 100 percent of its recycled water supply." It was also modified to more clearly articulate the challenge that the availability of recycled water poses for IEUA in meetings its obligations of the Santa Ana River Judgment. The revised text is on page 34, first full paragraph of the final Scoping Report.

6. ***Page 30, Task 7 paragraph, 2nd sentence which states "ensure that Watermaster is maximizing the reuse of recycled water…" should probably be refined to indicate that Watermaster is enabling/accommodating/facilitating the reuse of recycled water.***

   The text has been updated to reflect a reduction of Watermaster's role, as discussed in the response to comment number 2 above.

City of Ontario – Comments Provided by Katie Gienger

7. ***Activity B – Storage and Recovery Programs. The tasks of this activity are a duplication of efforts already underway by the Chino Basin Water Bank (CBWB). It is unclear what Watermaster will do above and beyond the activities already performed by the CBWB. The focus of this activity in***

the OBMP should be Watermaster's role in administering the Judgment, such as evaluating proposed Storage & Recovery programs for MPI.

The purpose of the Scoping Report is to provide the parties with an understanding of the work that would need to be performed to accomplish the desired outcomes of each of the 2020 OBMP Update activities. To the extent that the scopes of work described herein are already being partly or completely performed by Watermaster or others, the Scoping Report acknowledges such. The next steps in the process to prepare the 2020 OBMP Update will focus on the review and revision of the activities scoped herein and the integration of the ongoing activities with the existing OBMP. The recommended 2020 OBMP Implementation Plan, inclusive of ongoing and new activities will be documented in a subsequent report, *2020 Optimum Basin Management Program Update Report*, and will form the foundation for the parties to develop a final implementation plan and agreements to implement the OBMP Update. This purpose has been clarified in the report introduction on page 6, last paragraph.

Activity B is designed to obtain agreement on the specific objectives and desired benefits for Storage and Recovery (S&R) Programs, to identify "optimized" S&R programs that achieve the benefits while causing no material physical injury, and to help guide the development of future applications for S&R Programs. These outcomes are required for Watermaster to implement the Physical Solution of the Judgment and will support Watermaster approval of S&R applications. As such, Activity B is deemed necessary by Watermaster.

The second paragraph of the introduction to the Activity B scope of work (Page 27) acknowledges that prior work has been performed to describe and/or evaluate S&R programs for the Storage Framework Investigation, the Chino Basin Water Bank, and the Chino Basin Program. At such time that Activity B will be performed, the scope of work to will be updated to leverage this work.

8. ***Activity D – Maximize Reuse of Recycled Water. The tasks of this activity are a duplication of the IEUA recycled water efforts as described in our first general comment. It is unclear what Watermaster will do above and beyond the activities already performed by IEUA. For this reason, we recommend the parties discuss the best approach in scoping this activity to avoid a duplication of effort.***

   As to the first part of our comment on duplication, the introduction of Activity D scope of work acknowledges that the IEUA is performing a significant amount of work to evaluate opportunities to acquire surplus recycled water supplies for recharge as part of the CBP, and recommends that this work be leveraged to simplify the scope of Activity D. The description of IEUA's work has been expanded to reflect its various other efforts to analyze recycled water supply and demands.

   In the Scoping Report, the scope of work and costs to implement each OBMP Update activity were designed to achieve the desired outcomes defined by the stakeholders assuming that the activities could be implemented independently and that the planning efforts of others are not leveraged. The purpose of this assumption in the Scoping Report is to describe in detail the precise work required to achieve the outcomes. Additionally, the scopes of work and costs described in the Scoping Work leverage existing work being performed by Watermaster, but not by others. These assumptions are described on pages 14 and 15 of the Scoping Report under "Assumptions Applied in Defining the Scope of Work, Schedule, and Cost of the OBMP activities." There will be opportunities to leverage work done by other agencies to avoid duplication of effort and to reduce the costs.

As to the second part of your comment on Watermaster's role, please see the response to Comment 2 above. Additionally, it is important to note that not all aspects of the OBMP require direct involvement by the Watermaster. For example, in the 2000 OBMP Implementation Plan, there are several implementation actions in Program Elements 3 and 5 that were the responsibility of the Chino Desalter Authority or the IEUA.

9. ***Activity D – Maximize Reuse of Recycled Water, Page 28 – Santa Ana River Judgment – The TM states "The discharge requirements of the Judgment preclude the IEUA from reusing 100 percent of its recycled water supply." This statement is not accurate and should be revised to reflect that the SAR obligation is not required to be met with recycled water. The Santa Ana River Judgment states on page 9 "(1) At Prado. Base Flow shall: (i) include any water caused to be delivered by CBMWD or WMWD directly to OCWD, pursuant to its direction and control and not measured at the gages at Prado;" The Judgment anticipated using recycled water, but also allows for supplemental water to meet the SAR obligation, which was undertaken by Chino Basin Municipal Water District (now IEUA) on behalf of the Chino Basin producers***

   Please refer to the responses to Comments 4 and 5 above.

10. ***Activity EF – Each water purveyor tracks and monitors current and emerging constituents on its own behalf, including engaging in formal and informal discussions with other water purveyors facing similar challenges. Watermaster has historically provided an arena for data sharing and compilation as well as ideas on best practices which has been a valuable resource. Agencies are already required to perform the necessary monitoring for compliance of water systems permits; therefore a Groundwater Quality Management Plan (and the proposed monitoring program) may be a redundant effort. It is not clear what regulatory compliance Watermaster is subject to aside from its involvement in the Salt & Nutrient Management Plan related to hydraulic control.***

    The Judgment provides Watermaster the discretion to develop an OBMP, including both water quantity and water quality considerations. A groundwater quality management plan like the one scoped in the Scoping Report provides the parties with the comprehensive data and information, including best practices for monitoring, that are needed to understand and manage the future water quality challenges that could impact the parties' ability to fully utilize their pumping rights.

    Currently, water purveyors are not required by the State to perform monitoring of contaminants with State notification levels or other emerging contaminants of concern; the monitoring of these contaminants is voluntary until there is an established drinking water regulation or a mandated monitoring order. In the past monitoring of emerging contaminants in the Chino Basin was not prevalent, and often did not use the laboratory method detection limits low enough to understand the occurrence in relation to State notification levels, and the occurrence was not characterized well enough to prepare for compliance with potential drinking water regulations. As described in the Scoping Report, a recent example of this is 1,2,3-trichloropropane, which became regulated in late 2017. A groundwater quality management plan and associated monitoring program would not be a redundant effort as it will include strategies to investigate and analyze emerging contaminates in the Basin in a comprehensive and consistent way and that would leverage all existing groundwater monitoring performed by Watermaster and others. A groundwater quality management plan will ensure there is consistent and adequate monitoring of emerging contaminants as they are being identified to plan for potential water quality regulations, and if needed identify the most efficient means to address regional water-quality challenges.

As to concerns of duplication, please also refer to responses to Comments 7 and 8 above.

Inland Empire Utilities Agency – Comments on Scoping Report Part 1 Provided by Sylvie Lee and Joshua Aguilar

11. ***Page 1, regarding the title of Activity D, suggested edit to add direct use in the title, or does it not take into account direct use of recycled water?***

    The maximization of recycled water reuse in Activity D is meant to encompass all forms of recycled water reuse including: direct non-potable reuse (landscape irrigation or industrial uses), groundwater recharge or injection (indirect potable reuse), and direct potable reuse. See page 30 for description of Activity D's objective.

12. ***Page 2, regarding the title of Activity HIJ, should it reference subsequent implementation plan instead of the OBMP Update?***

    The term OBMP Update is not exclusive of the implementation plan or the agreements to implement it.

13. ***Page 14, in the summary of Activity A, third bullet. Can we say something to the effect of minimizing losses or is that covered under pumping sustainability?***

    The text of the bullet was expanded to include reference to the need to maintain hydraulic control. The revised text is on page 20, third bullet of the final Scoping Report.

14. ***Page 19, fourth bullet. External funding should be listed [as something that the Storage and Recovery Program Master Plan will enable the parties to do] as this has been very successful for the region in reducing the cost of successful programs (GWR, Desalter, RW, etc.).***

    Concur. As, described under the "Summary" section for Activity B, the Storage and Recovery Master Plan can provide support in the application for external funding (grants and low-interest loans). The term "external funding" has been added to the list of things that can offset Watermaster assessments and reduce OBMP assessments. The revised text is on page 24, first bullet of the final Scoping Report.

15. ***Page 21, first paragraph. Is this [Storage and Recovery Program Master Plan] a new one that needs to be created or is it the Storage Management Plan? What is the purpose and shelf life in addition to the SMP?***

    The 2020 Storage Management Plan is a set of rules by which to manage all storage in the Chino Basin, including the parties' local storage accounts and S&R Programs—it does not define how S&R programs should be designed to achieve the benefits desired by the parties. Activity B is designed to obtain agreement on the specific objectives and desired benefits for S&R Programs, to identify "optimized" S&R programs that achieve the benefits, to help guide the development of future applications for S&R Programs, and to help apply for grants and low-interest loans to implement S&R Programs. This work will be documented as the Storage and Recovery Master Plan, which may need to be updated to be consistent with periodic updates to the Storage Management Plan.

16. ***Page 21, first paragraph. Is that our goal, "to reference a common set of objectives for storage and recovery programs and align the objectives with requirements in grant applications and other funding opportunities"? Seems like "Master Plan" should be broader than individual S&R requirements.***

    Please refer to the response to Comment 15.

17. ***Page 38, under "Scope of Work for Activity EF." Are there recommendations for the "centralized" treatment options as suggested in the "needs"?***

    As described in the "Scope of Work for Activity EF" section, Task 5 of the scope of work for Activity EF is to identify groundwater quality treatment projects using existing and new facilities, to screen them using agreed upon criteria developed in Task 4, and to select a final list of projects for detailed evaluation in Task 6. The groundwater quality treatment projects can range from individual well-head treatment to regional treatment plants. Under Task 6, cost opinions for these projects will be developed and will include a comparison of the cost to implement treatment projects by individual municipal agencies to those of collaborative projects.

San Antonio Water Company – Comments Provided by Brian Lee

Monte Vista Water District – Comments Provided by Mark Kinsey (reiterative of SAWCo comments)

18. ***General Note of Duplication. A majority of the proposed activities duplicate existing planning efforts, as outlined in the below chart and further discussed per activity below:***

Proposed Activity	**Existing Planning Efforts**
Activity A	Recharge Master Plan; Recharge Investigations & Projects Committee
Activity B	Chino Basin Water Bank; Inland Empire Utilities Agency
Activity D	Inland Empire Utilities Agency and Contracting/Member Agencies; Jurupa Community Services District; City of Pomona
Activity E/F	Local Agencies; Water Quality Committee (existing authority to reconvene)
Activity K	Maximum Benefit Salt and Nutrient Management Plan
Activity C/G	Integrated Resource Plan

Please refer to the responses to Comments 7, 8, and 10. Please also note that in the next step of the 2020 OBMP Update process the OBMP Update activities described in the Scoping Report will be integrated with the 2000 OBMP Program Elements. If the implementation actions that arise from the OBMP Update activities are already encompassed by the existing actions in the 2000

OBMP IP, then no new implementation actions will be included in the 2020 OBMP Update. See responses to comments 19 through 24 for more detail about specific activities.

19. ***Activity A. We disagree with this activity and its implementation schedule because it duplicates an existing and active planning effort, the Recharge Master Plan (RMP). The RMP has been developed and updated consistent with the Peace Agreements. Watermaster's Recharge Investigations and Projects Committee (RIPCom)- open to all parties- meets quarterly to review the ongoing implementation of the latest RMP. The process of updating the RMP includes an exhaustive review of opportunities to improve Basin recharge, and each RIP Com meeting agenda includes a standing item for discussion and consideration of new recharge projects.***

    Watermaster staff has verbally confirmed with certain parties that there is no intent to duplicate the RMP process, and that this activity proposes instead to continue the existing process. However, the current draft of the technical memorandum lacks clarity on how newly proposed activities enhance existing activities. Overall, we believe there is no need to create a new process (with associated costs) that duplicates an existing, successfully implemented ongoing process.

    As described in the report on pages 16 and 17, based on the alignment of the objectives of Activity A with those of the RMPU, Activity A can be accomplished through the existing RMPU process. The scope of work summarized in the report is for developing the 2023 RMPU, not in addition to it. Please also refer to responses to Comments 7, 8, 10, and 18 regarding duplication of efforts.

20. ***Activity B. We disagree with this activity and its implementation schedule because it duplicates existing and active planning efforts to develop Storage and Recovery Programs. The Peace Agreement provides criteria for Watermaster to facilitate and regulate the development of Storage and Recovery Programs that "provide broad mutual benefits" to the Judgment parties (¶5.2(c)). We are aware of two entities, the Chino Basin Water Bank and the Inland Empire Utilities Agency (IEUA), that are actively engaged with Watermaster and their partners in developing Storage and Recovery Program proposals. We believe that these and other potential applicants should cover the cost of demonstrating how their proposed Storage and Recovery Programs may provide broad mutual benefits to the parties. Additionally, Watermaster's role in facilitating Storage and Recovery Programs necessitates a healthy division between the evaluating and approving entity (Watermaster) and the Program applicant(s).***

    The Peace Agreement assigns Watermaster as the evaluating and approving entity for S&R Programs. As such, Watermaster must have criteria upon which to define and evaluate "broad mutual benefits" of S&R Programs. Activity B includes a process for the parties and Watermaster to build and achieve consensus on the definition(s) of broad mutual benefits and the objectives of S&R Programs. These definitions are key to Watermaster's ability to evaluate and rank S&R Programs when presented with applications. Activity B also helps guide the parties (or others) in the development of S&R Programs, so that the application and evaluation process is most efficient.

    As to duplication of efforts, the intention of Activity B is to leverage past and current work to the maximum extent. The description in Activity B states that: "Prior work has been performed for the Storage Framework Investigation, the Chino Basin Water Bank, and the Chino Basin Program.

These past efforts can be leveraged…" in the execution of Activity B. See also the responses to Comments 7, 10, and 18.

21. ***Activity D. We disagree with this activity and its implementation schedule because it duplicates existing and active planning efforts by IEUA, IEUA member agencies, Jurupa Community Service District, and the City of Pomona. These planning efforts seek to address the full and beneficial utilization of recycled water supplies available in the Chino Basin. We believe parallel planning processes are neither advisable nor cost-effective.***

    Please refer to the responses to Comments 8 and 18.

22. ***Activity E/F. We disagree with this activity and its implementation schedule because it proposes activities that are either outside of Watermaster's authority or already authorized under the existing OBMP Implementation Plan. Water quality compliance is the responsibility of water providers under their respective operating permits. Watermaster' s role under the OBMP Implementation Plan is to monitor water quality to ensure that parties' use of the basin meet Basin Plan objectives and do not cause material physical injury. The existing OBMP Implementation Plan already directs Watermaster to form a "water quality committee" to oversee and provide input on these activities; we see no reason why Watermaster cannot reconvene such a committee under its existing authority.***

    Please refer to the responses to Comments 10 and 18.

23. ***Activity K. We disagree with this activity and its implementation schedule because the Maximum Benefit Salt and Nutrient Management Plan already contains dilution compliance requirements that Basin parties must meet in order to continue recharging recycled water. As stated in the sixth listening session, Watermaster and IEUA are already implementing this activity through their work in developing a Basin Plan amendment proposal, and that the activity simply proposes to "do what we are doing."***

    Activity K will ensure that the evaluation of a future compliance challenge with the recycled water dilution requirements will be done on a routine basis hereafter and not just during the current investigation to support the Basin Plan amendment proposal – such a routine assessment will also be required by the Regional Board, as described in the discussion of Activity K. Please also refer to response to Comments 7, 8, 10, 18, and 21.

24. ***Activity C/G. We disagree with this activity and its implementation schedule because it duplicates IEUA's ongoing integrated resource planning process. All parties and Watermaster staff are participating in this planning process, which is focused on identifying projects to improve the reliability and resiliency of regional water supplies.***

    Please refer to the response Comments 7, 8, 10, and 18.

25. ***Activity L. This is a proposed review of Watermaster's current monitoring and reporting processes to ensure they are as efficient and cost-effective as possible. We consider this review an essential administrative best practice and fully support its immediate implementation and incorporation into Watermaster's Rules and Regulations and other procedural documents, as appropriate.***

Comment noted. Watermaster proposes that it be implemented in Fiscal Year 2020/21 and will present if for consideration in the budget at the appropriate time.

26. ***Activity H/I/J. The Chino Basin Judgment establishes the following requirement for basin management, inclusive of the OBMP: "In the process of implementing the physical solution for Chino Basin, Watermaster shall consider the following parameters: ... (c) Economic Considerations. - Financial feasibility, economic impact and the cost and optimum utilization of the Basin's resources and the physical facilities of the parties are objectives and concerns in equal importance to water quantity and quality parameters" (Exhibit "I" ¶(c), emphasis in original).***

    Here and elsewhere in the Court-approved management agreements, Watermaster is directed to consider economics - inclusive of equitable distribution of costs and benefits, reductions in costs, and funding opportunities - for all basin management activities tied to implementation of the Physical Solution. Therefore, we respectfully request that Watermaster fulfill this requirement to incorporate economic considerations into any agreed-upon activity in this and any other basin management process.

    Comment noted. As stated on pages 80 and 81 regarding economic considerations:

    "The objectives for Activities H, I, and J can be efficiently met by incorporating tasks within the other activities to characterize the benefits and costs of the projects produced by the activities."

    and

    "The steps to achieve an equitable allocation of benefits and costs should be addressed by in the agreement that will be developed by the parties to implement the 2020 OBMP Update. The 2020 OBMP implementation agreement could be designed to ensure that the desired extent of cost/benefit assessments are performed to support equitable cost allocations in the implementation of activity scopes of work, to anticipate and accommodate the development of project implementation agreements that define the project-specific cost/benefit allocation, and to periodically update cost projections for implementation of the 2020 OBMP Update activities and associated projects to support planning of financial resources."

Appendix D

Stakeholder Participation Log

Appendix D

Stakeholder Attendance at the OBMPU Listening Sessions

Name	Agency/Stakeholder	LS1	LS2	LS3	LS4	LS5	LS6	LS7	LS8
Bob Feenstra	Agricultural Pool		X	X				X	X
Jeff Pierson	Agricultural Pool	X	X	X				X	
Diana Frederick	Agricultural Pool - State of CA		X						
Craig Stewart	Agricultural Pool - State of CA/CIM				X				
Pete Hall	Agricultural Pool - State of CA/CIM		X	X					
John Schatz	Appropriative Pool		X		X				X
John Thornton	Arcadis (consultant to the Chino Basin Water Bank)					X	X	X	X
Brian Geye	Auto Club Speedway	X	X				X	X	X
Andrew Lazenby	Brown and Caldwell (consultant to IEUA)			X					
Tom O'Neill	Chino Basin Desalter Authority		X	X					
Elizabeth Skrzat	Chino Basin Water Conservation District							X	
Kristen Wegner	Chino Basin Water Conservation District	X		X	X				
Don Galeano	Chino Basin Watermaster Board			X					
Ron Craig	Chino Hills, City of	X	X	X	X	X	X	X	X
Amanda Coker	Chino, City of	X	X	X		X		X	X
Dave Crosley	Chino, City of	X	X			X	X		X
Eunice Ulloa	Chino, City of	X		X	X	X		X	
Bob Page	County of San Bernardino		X						
Eduardo Espinoza	Cucamonga Valley Water District	X	X	X	X	X		X	X
John Bosler	Cucamonga Valley Water District						X		
Praseetha Krishnan	Cucamonga Valley Water District	X	X			X	X	X	
Tracy Egoscue	EIG (representing the Agricultural Pool)	X	X	X		X	X	X	X
Shawnda Grady	Ellison, Schneider & Harris (representing JCSD)		X						
Eric Tarango	Fontana Union Water Company	X		X				X	
Josh Swift	Fontana Union Water Company				X	X		X	
Cris Fealy	Fontana Water Company	X		X	X	X	X		
Roger Putty	GEI (consultant to IEUA)				X				
Chris Berch	Inland Empire Utilities Agency	X	X	X	X				
Christiana Daisy	Inland Empire Utilities Agency							X	
Joshua Aguilar	Inland Empire Utilities Agency		X		X	X		X	X
Kirby Brill	Inland Empire Utilities Agency	X							
Liz Hurst	Inland Empire Utilities Agency			X	X				
Liza Muñoz	Inland Empire Utilities Agency					X	X	X	
Sylvie Lee	Inland Empire Utilities Agency	X	X	X	X		X	X	X
Abhi Singh	Intera (consultant to IEUA)		X						
Betty Anderson	Jurupa Community Services District				X				
Chris Berch	Jurupa Community Services District					X	X	X	X
Eldon Horst	Jurupa Community Services District			X	X				
Steven Popelar	Jurupa Community Services District		X						
Ed Means	MC (consultant to Chino Water Bank)					X			
Brandon Goshi	Metropolitan Water District	X		X	X			X	X
Justin Scott-Coe	Monte Vista Water District					X	X	X	
Van Jew	Monte Vista Water District		X			X			

Appendix D

Stakeholder Attendance at the OBMPU Listening Sessions

Name	Agency/Stakeholder	LS1	LS2	LS3	LS4	LS5	LS6	LS7	LS8
Bob Bowcock	Non-Agricultural Pool	X	X		X				
Wendy Sanders	NRG/ERM	X							
Courtney Jones	Ontario, City of	X	X	X	X	X			
Katie Gienger	Ontario, City of			X	X	X	X	X	X
Scott Burton	Ontario, City of		X						
Marsha Westropp	Orange County Water District	X					X		
Chris Diggs	Pomona, City of	X	X		X	X	X	X	X
Darron Poulsen	Pomona, City of	X	X			X	X	X	
Raul Garibay	Pomona, City of	X	X	X					
Brian Lee	San Antonio Water Company	X				X			
Teri Layton	San Antonio Water Company	X			X	X			X
James McKenzie	San Bernardino County Flood Control District				X	X		X	
Jorge Vela	San Bernardino County Flood Control District					X			
Marty Zvirbulis	San Gabriel Valley Water Company							X	
Tom Harder	TH&Co (representing the Appropriative Pool)	X		X	X		X	X	X
John Mendoza	Three Valleys Municipal Water District	X	X	X		X	X		X
Matt Litchfield	Three Valleys Municipal Water District		X	X		X			
Tim Kellett	Three Valleys Municipal Water District					X		X	X
Harrison Nguyen	Upland, City of	X							
Rosemary Hoerning	Upland, City of	X	X	X	X				
Steve Ledbetter	Upland, City of							X	
Steve Nix	Upland, City of					X	X		
Nadia Loukeh	West Valley Water District			X					
Jason Pivovaroff	Western Municipal Water District				X	X			X
Ryan Shaw	Western Municipal Water District	X	X	X			X	X	
Rick Rees	Wood (representing State of CA)	X	X	X		X	X	X	X
Individual Count		31	32	29	25	30	21	30	21
Stakeholder Count		19	17	19	18	17	17	21	16

Appendix E

2020 Storage Management Plan

2020 STORAGE MANAGEMENT PLAN
FINAL REPORT

DECEMBER 11, 2019

Prepared for:

Prepared by:

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Acronyms, Abbreviations, and Initialisms

af	acre-feet
afy	acre-feet per year
DYYP	Dry Year Yield Program
IEUA	Inland Empire Utilities Agency
MPI	Material Physical Injury
MZ1	Management Zone 1
MZ2	Management Zone 2
MZ3	Management Zone 3
OBMP	Optimum Basin Management Program
OBMPU	Optimum Basin Management Program Update
SFI	Storage Framework Investigation
SMP	Storage Management Plan

Section 1 – Background

The objective of this report is to describe the 2020 Storage Management Plan (SMP).[1] The basis of the 2020 SMP was described in the *Final 2020 Storage Management Plan White Paper*,[2] which has been incorporated into this document as Appendix A. The Watermaster stakeholders reviewed and commented on the draft White Paper and participated in two workshops that occurred in June and July 2019. The final technical requirements of the 2020 SMP were developed in part from the work conducted in the 2018 *Storage Framework Investigation*[3] (SFI), the White Paper, and discussions with the Watermaster stakeholders. The draft versions 1 and 2 of the 2020 SMP were distributed to the Watermaster stakeholders on September 6, 2019 and October 24, 2019, respectively. The Watermaster stakeholders provided comments on these drafts and the complete set of comments and Watermaster staff responses are included in Appendices B1 and B2. Some of the comments resulted in updates to the to the 2020 SMP and they are included herein.

Groundwater pumping rights in the Chino Basin were adjudicated in the 1970s and settled in the 1978 stipulated agreement (Judgment). The Judgment[4] established a Watermaster to administer the decree under the court's continuing jurisdiction and empowered it to manage and control available storage capacity and to enter into agreements for the storage of water. As a prerequisite to implementing the Optimum Basin Management Program (OBMP) the Parties[5] executed the Peace Agreement, providing direction and guidance to Watermaster on how storage should be prioritized and managed. The OBMP addresses the management of groundwater pumping, recharge, storage and recovery, and the transfer of water. The prevailing standard for all operations is the avoidance of "Material Physical Injury" (MPI)[6,7] under Court-Approved Management Agreements executed contemporaneously.

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[1] The abbreviation "SMP" means Storage Management Plan. When referring specifically to the 2020 Storage Management Plan the year "2020" precedes SMP (i.e. 2020 SMP).

[2] Wildermuth Environmental, Inc. (2019). *Final 2020 Storage Management Program White Paper*. This report can be found here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=1847

[3] Wildermuth Environmental, Inc. (2018). *Storage Framework Investigation, Final Report*. This report can be found here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=1429

[4] Original Judgment in Chino Basin Municipal Water District vs. City of Chino, et al., signed by Judge Howard B. Weiner, Case No. 164327. File transferred August 1989, by order of the Court, and assigned new case number RCV51010. The Restated Judgment can be found here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=247

[5] The terms Party and Parties refer to a party to the Judgment, party to the Peace and or Peace II Agreement, or a party to all three.

[6] Defined terms in the Court Approved Management Agreements will appear with the first letter of each word capitalized; a footnote with their definitions is included at the first use of the defined term.

[7] "Material Physical Injury" means material injury that is attributable to the Recharge, Transfer, storage and recovery, management, movement or Production of water, or implementation of the OBMP, including, but not limited to, degradation of water quality, liquefaction, land subsidence, increases in pump lift (lower water levels), and adverse impacts associated with rising Groundwater. Material Physical Injury does not include "economic

Given the passage of twenty years since its approval, Watermaster has revisited the OBMP goals and objectives and plans to update the OBMP by June 2020 (hereafter, 2020 OBMPU). Updating the SMP is integral to the 2020 OBMPU. The 2020 SMP will be incorporated into the 2020 OBMPU and its implementation plan.

The term "managed storage" as used herein (and consistent with the 2018 SFI) refers to water stored by the Parties and other entities and includes Carryover,[8,9] Local Storage,[10] and Supplemental Water[11] held in storage accounts by the Parties and Storage and Recovery Programs.[12] Local Storage includes Excess Carryover[13] for the Overlying Non-Agricultural Pool Parties and Excess Carryover and Supplemental Waters for the Appropriative Pool and Overlying Non-Agricultural Pool Parties.

1.1 Storage Agreements and Transfers from Storage Accounts

Since the Judgment came into effect, Watermaster developed rules and regulations, standard storage agreements, and related forms. There are three types of storage agreements that result in five types of storage accounts: Excess Carryover, Local Supplemental-Recycled, Local Supplemental-Imported, Pre-2000 Quantified Supplemental, and Storage and Recovery. An Excess Carryover account includes a Party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool Parties and Operating Safe Yield for Appropriative Pool

injury" that results from other than physical causes. Once fully mitigated, physical injury shall no longer be considered material. [Peace Agreement § 1.1(y).]

8 Defined terms in the Court Approved Management Agreements will appear with the first letter of each word capitalized and a footnote with their definitions is included at the first use of the defined term.

9 "Carry-Over Water" means the un-Produced water in any year that may accrue to a member of the Overlying Non-Agricultural Pool or the Appropriative Pool and that is Produced first each subsequent Fiscal Year or stored as Excess Carry-Over. (Judgment Exhibit H ¶ 12.)

10 "Local Storage" means water held in a storage account pursuant to a Local Storage Agreement between a party to the Judgment and Watermaster. Local Storage accounts may consist of: (i) a Producer's unproduced Excess Carry-Over Water or (ii) a party to the Judgment's Supplemental Water, up to a cumulative maximum of one hundred thousand (100,000) acre-feet for all Parties to the Judgment stored in the Basin on or after July 1, 2000 or (iii) that amount of Supplemental Water previously stored in the Basin on or before July 1, 2000 and quantified in accordance with the provisions and procedures set forth in Section 7.2 of these Rules and Regulations, or (iv) that amount of water which is or may be stored in the Basin pursuant to a Storage Agreement with Watermaster which exists and has not expired before July 1, 2010. [Peace Agreement § 1.1(x).]

11 "Supplemental Water" means water imported to Chino Basin from outside the Chino Basin Watershed and Recycled Water. [Judgment ¶ 4(bb) and Peace Agreement § 1.1(ww).]

12 "Storage and Recovery Program" means the use of the available storage capacity of the Basin by any person under the direction and control of Watermaster pursuant to a Court approved Groundwater Storage Agreement but excluding "Local Storage," including the right to export water for use outside the Chino Basin and typically of broad and mutual benefit to the Parties to the Judgment. [Peace Agreement §1.1(uu).]

13 "Excess Carry-Over Water" means Carry-Over Water which in aggregate quantities exceeds a party's share of Safe Yield in the case of the Non-Agricultural Pool, or the assigned share of Operating Safe Yield in the case of the Appropriative Pool, in any year.

Parties) and Basin Water acquired from other Parties. A Local Supplemental Water account includes imported and recycled water that is recharged by a Party and similar water acquired from other Parties. A Storage and Recovery account includes Supplemental Water and the Peace Agreement requires that Watermaster shall give first priority to Storage and Recovery Programs that produce a "broad and mutual benefit to the Parties to the Judgment."[14] Watermaster tracks the puts, takes, losses, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process. The losses assessed by Watermaster are based on the amount of water in managed storage (excluding Carryover) and they offset the increase in groundwater discharge to the Santa Ana River from the Chino Basin attributable to managed storage (excluding Carryover). Watermaster also assesses losses due to evaporation on the puts when water is recharged in spreading basins.

In evaluating applications for storage agreements, Watermaster must conduct an investigation to determine if the water stored and recovered under a proposed storage agreement has the potential to cause MPI to a Party or the basin. If Watermaster determines that implementation of the proposed storage agreement has the potential to cause MPI, the applicant must revise its application and demonstrate that there will be no MPI, or Watermaster must impose conditions in the storage agreement to ensure there is no MPI. Watermaster cannot approve a storage agreement that has the potential to cause MPI.

The Restated Judgment provides that the Basin's groundwater storage capacity may be utilized for the storage and conjunctive use of supplemental water only under Watermaster control and regulation and that no use of such capacity be made except pursuant to written agreement with Watermaster (Restated Judgment, ¶ 11, 12; see also Peace Agreement, § 5.2(a)). The Pooling Plans of the Overlying (Non-Agricultural) Pool (Restated Judgment Exhibit "G") and the Appropriative Pool (Restated Judgment Exhibit "H") each require agreement with Watermaster as a condition of storing Excess Carryover water within the Basin.

Consistent with ¶'s 14 and 28 of the Restated Judgment and the Chino Basin Watermaster Rules and Regulations ("Rules and Regulations"), storage of water within the Basin has been accomplished pursuant to Watermaster's existing Form 1 (Application for a Local Storage Agreement) and Form 8 (Standard Local Storage Agreement). The Board enters into storage agreements only after an application is noticed and considered by the Pool Committees, Advisory Committee, and Watermaster Board (see Rules and Regulations, Article X), and when a finding is made that storage will not result in MPI to any Party to the Judgment or the Basin. (Peace Agreement, § 5.2(b)(iv).)

The Form 1 Application for Local Storage Agreement was approved in 2001 and has not been amended since that time; it is the mechanism through which Parties may apply to enter into a Local Storage Agreement.

The Form 8 Local Storage Agreement, as it was similarly approved by the Court in 2001 and still exists today, provides for the storage of a set quantity of water for the duration of the Peace Agreement. While Watermaster tracks production on a quarterly basis and accounts for unproduced water and water entering storage annually, in the event that a Party wishes to increase its quantity of water in storage—either via recharge of Supplemental Water or the

[14] See §5.2(c)(iv)(b) of the Peace Agreement

accrual of Excess Carryover water—in order to ensure that that the additional quantity of water is stored in compliance with the provisions of the Restated Judgment, Peace Agreement, and Rules and Regulations, it must enter into a new storage agreement. In practice, this means that each of the members of the Overlying (Non-Agricultural) and Appropriative Pools must go through the application process each year in which their balances of stored water increase.

The Parties, amongst themselves, are actively involved in water transfers of annual unproduced rights in the Safe Yield and water in their storage accounts. Watermaster has an application and review process for transfers that is similar to the storage agreement application process. Transfers are one way that the Parties recover water held in storage accounts.

1.2 Existing Managed Storage and Proposed Storage and Recovery Programs

The Parties engage in conjunctive-use activities individually by storing Basin and Supplemental Waters that are in excess of their demands and subsequently recover that water as their individual needs arise. These activities collectively cause a temporary increase in managed storage. Table 1-1 summarizes the amount of water in managed storage by the Parties. Table 1-1 also shows the amount of water stored by the Metropolitan Water District of Southern California (Metropolitan) Dry-Year Yield Program (DYYP). The total volume of water in managed storage as of June 30, 2019 was 549,244 af.

Table 1-1 Ending balances in managed storage in the Chino Basin (af)

Fiscal Year ending June 30	Appropriative Pool				Overlying Non-Agricultural Pool			Total Managed Storage by Parties	Dry Year Yield Program Storage	Total Managed Storage
	Carryover	Excess Carryover	Local Supplemental Storage	Subtotal	Carryover	Excess Carryover	Subtotal			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (7) + (4)	(9)	10) = (9) + (8
2000	28,911	170,342		199,253	6,541	31,031	37,572	236,825	0	236,825
2001	15,940	77,907	92,813	186,660	5,301	32,330	37,631	224,291	0	224,291
2002	13,521	70,103	87,801	171,425	5,285	33,727	39,012	210,437	0	210,437
2003	18,656	71,329	81,180	171,165	6,743	36,850	43,593	214,758	7,738	222,496
2004	21,204	70,503	80,963	172,670	7,177	40,881	48,058	220,728	26,300	247,028
2005	21,289	76,080	88,849	186,218	7,227	45,888	53,115	239,333	38,754	278,087
2006	32,062	56,062	86,170	174,294	7,227	49,178	56,405	230,699	58,653	289,352
2007	34,552	50,895	83,184	168,631	7,084	51,476	58,560	227,191	77,116	304,307
2008	41,626	83,962	81,520	207,108	6,819	45,248	52,067	259,175	74,877	334,052
2009	42,795	101,908	79,890	224,593	6,672	46,600	53,272	277,865	34,494	312,359
2010	41,263	120,897	90,133	252,293	6,934	47,732	54,666	306,959	8,543	315,502
2011	41,412	146,074	98,080	285,566	6,959	49,343	56,302	341,868	0	341,868
2012	42,614	209,981	116,138	368,733	6,914	13,993	20,907	389,640	0	389,640
2013	39,413	225,068	116,378	380,859	7,073	15,473	22,546	403,405	0	403,405
2014	41,708	224,496	123,484	389,688	6,478	12,812	19,290	408,978	0	408,978
2015	40,092	239,517	127,994	407,603	6,823	12,225	19,048	426,651	0	426,651
2016	39,733	248,013	131,522	419,267	7,195	9,949	17,144	436,411	0	436,411
2017	38,340	260,682	143,552	442,575	7,226	8,292	15,519	458,093	6,315	464,408
2018	34,582	254,221	155,018	443,821	7,198	10,775	17,973	461,795	41,380	503,174
2019	38,605	279,033	166,406	484,044	7,227	12,004	19,231	503,275	45,969	549,244

The 2018 SFI projected that for the planned use of managed storage by the Parties up to 700,000 af that Hydraulic Control would be maintained, that there would be no MPI, and that there would be an adverse impact from the reduction of net recharge and Safe Yield attributable to the use of managed storage. The 2018 SFI made an identical finding for Storage and Recovery

Programs that would operate in an identical manner to the existing Metropolitan DYYP and using the managed storage space between 700,000 af and 800,000 af.

As of June 30, 2019, the Parties' aggregate amount of water in managed storage was 503,275 af (see Table 1.1). The Parties are projected to use in aggregate about 720,000 af of managed storage for their individual conjunctive-use operations based on the most recent planning information provided by them (See Appendix C). The projected average annual increase in managed storage by the Parties is about 21,600 afy through 2030, after which the aggregate amount of managed storage space used by the Parties is projected to decline through about 2070.

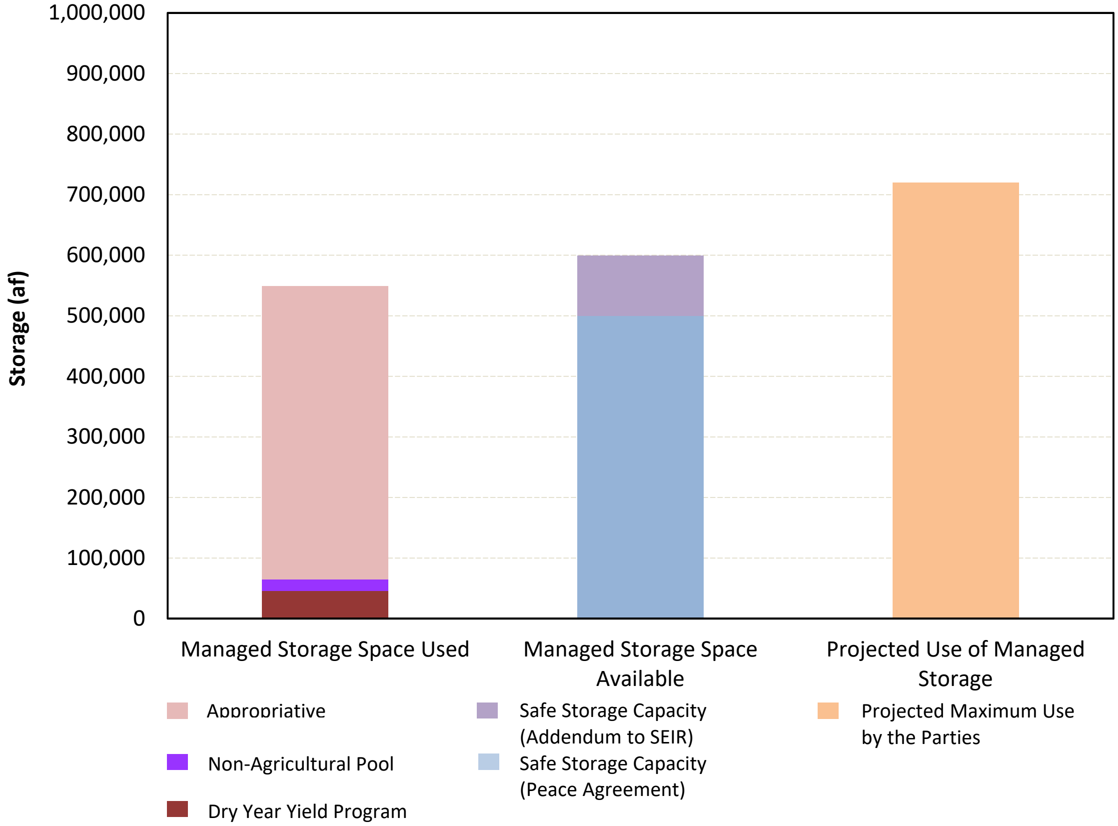
Metropolitan's DYYP is the only active Storage and Recovery Program in the basin. The DYYP can store up to 100,000 af with maximum puts of 25,000 afy and maximum takes of 33,000 afy. The DYYP Storage and Recovery Program agreement provides that puts and takes can exceed these values if agreed to by Watermaster (as was done in fiscal years 2018 and 2009, respectively). As of June 30, 2019, there was 45,969 af stored in the DYYP account. The agreement that authorizes the DYYP will expire in 2028.

The combined use of managed storage by the Parties and Metropolitan's DYYP is projected to reach a maximum of about 790,000 af assuming that the DYYP has 100,000 af in storage in 2028 and that subsequent to 2028 Metropolitan removes that water from managed storage at the contract rate of 33,300 afy starting in 2029.

Figure 1-1 compares the current amount of water in managed storage to the managed storage space available and the projected use of storage space by the Parties. The managed storage space used is 549,244 af. The amount of managed storage space available for use by the Parties pursuant the 2010 Peace II Project Subsequent Environmental Impact Report and its 2017 Addendum is 600,000 af. The storage space used by the Parties will exceed this 600,000 af limit by 120,000 af by 2030.[15]

[15] See Appendix C for updated groundwater pumping and managed storage projections.

Figure 1-1 Comparison of managed storage space used, managed storage space available, and projected maximum use of managed storage by the Parties



The IEUA and some of the Parties are considering Storage and Recovery Programs with yet-to-be proposed operational parameters. According to the discussions in the development of the 2018 SFI, the amount of storage space required in aggregate for all contemplated Storage and Recovery Programs, including the DYYP, is projected to range between 200,000 and 300,000 af.

Section 2 – Storage Management Plan Description

This section describes the 2020 SMP based on the requirements of the Judgment, the Peace Agreement, the conclusions of the 2018 SFI, the 2020 SMP White Paper, and Watermaster stakeholder input from the 2020 SMP workshop process during the period of June through December 2019.

2.1 Use of Storage Space by the Parties for Their Individual Conjunctive-Use Activities and by Entities Engaged in Storage and Storage and Recovery Programs

An aggregate amount of 800,000 af is reserved for the Parties' conjunctive-use activities (includes Carryover, Excess Carryover, and Supplemental Accounts) and Metropolitan's DYYP. This amount is referred to as the "First Managed Storage Band" (FMSB).

The managed storage space between 800,000 and 1,000,000 af is reserved for Storage and Recovery Programs. Storage and Recovery Programs that utilize the managed storage space above 800,000 af will be required to mitigate potential MPI as if the 800,000 af were fully used. Renewal or extension of the DYYP agreement will require the DYYP to use storage space above 800,000 af.

The allocation of storage space for use by Parties and for Storage and Recovery Programs may be revised in subsequent updates of the SMP.

Note that the use of managed storage greater than 1,000,000 af may be possible provided the storing entity submits a Storage and Recovery Program application, demonstrates that the program has broad mutual benefit, demonstrates that program's mitigation measures will meet the mitigation requirements of the Watermaster to ensure there will be no MPI and other adverse impacts[16], complies with CEQA, and obtains approval from the Watermaster.

2.2 Reservation of Existing Spreading Basin Facilities to Satisfy Watermaster Recharge and Replenishment Obligations

The Parties and IEUA, through the OBMP, have substantially increased storm and supplemental water recharge capacity in the Chino Basin. The increase in supplemental water recharge capacity was done to ensure that Watermaster could meet its future recharge and replenishment obligations pursuant to Court and Regional Board orders. Watermaster will include provisions in storage agreements to prioritize the use of spreading basins to satisfy Watermaster's recharge and replenishment obligations over the use of spreading basins for other uses subject to limitations provided in existing agreements with the owners of the facilities.

[16] Adverse impacts include reductions in net recharge and Safe Yield; and an increase in the groundwater discharge from the Chino North GMZ to the Santa Ana River contributing to a loss of Hydraulic Control.

2.3 Storage Management Activities of the Parties

2.3.1 Limitation of Transfers or Leases of Water Rights and Water Held in Managed Storage

Early in the OBMP implementation period, Watermaster determined that transfers or leases of water rights and water held in managed storage (hereafter transfers) from Parties that are situated such that they pump groundwater outside of MZ1 to Parties that pump in MZ1 for *the purpose of replenishment* have the potential to cause MPI.[17]

This limitation on transfers should be reconsidered if the land subsidence management plan for MZ1 includes consideration for such transfers, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan.

2.3.2 Mitigation of Reduced Net Recharge and Safe Yield

The 2018 SFI demonstrated that storing water has the effect of reducing net recharge and Safe Yield. The reduction in net recharge caused by storage is an adverse impact. The Safe Yield, a prospective calculation, is based on projected estimates of net recharge that include the effects of managed storage on net recharge[18]. The reduction in Safe Yield due to projected storage management by the Parties is thus incorporated into the Safe Yield estimate. Watermaster considers this adverse impact to be mitigated by the prospective calculation of the Safe Yield.

2.4 Storage and Recovery Programs

2.4.1 Prioritization of Put and Take Operations in MZ2 and MZ3

Storage and Recovery programs are implemented through a series of "puts" and "takes" where water goes into storage during a put and is recovered from storage during a take. Based on the results of the 2018 SFI, these puts and takes should be prioritized to occur in MZ2 and MZ3 to avoid new land subsidence and interfering with land subsidence management in MZ1, to minimize pumping sustainability challenges, to minimize the impact of storage and recovery operations on solvent plumes, to preserve the state of Hydraulic Control, and to take advantage of the larger and more useful groundwater storage space in MZ2 and MZ3.

This spatial prioritization on puts and takes should be reconsidered if the land subsidence management plan for MZ1 includes consideration for Storage and Recovery programs, the land subsidence management plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan.

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[17] See the report entitled: Material Physical Injury analysis – Monte Vista Water District lease of West Valley Water District production rights in the Chino Basin for fiscal year 2006/07. Prepared by WEI in April 2007.

[18] Refer to the 2015 Reset Technical Memorandum and the April 2017 Court Order for additional information on the Safe Yield reset methodology. These documents can be found here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=1595.

2.4.2 Evaluation of Storage and Recovery Program Impacts, MPI, and Mitigation

The intent of this provision is to reaffirm the requirements of ¶ 12 of the Judgment and §5.2(c)(xiii) and 5.2(c)(ix) of the Peace Agreement, as to the review and approval of Storage and Recovery Program applications, and to require Storage and Recovery Program storage agreements to provide provisions that require Storage and Recovery Program participants to cease or modify their operations if Watermaster determines, subsequent to Watermaster and Court approval of a Storage and Recovery Program storage agreement, that the participant's storage and recovery operations are causing or threaten to cause MPI. The types of MPI to be addressed include but are not limited to land subsidence, pumping sustainability, water quality, shallow groundwater, and liquefaction.

Watermaster will review each Storage and Recovery Program application, estimate the surface and ground water systems response, prepare a report that describes the response and potential MPI, and develop mitigation requirements to mitigate MPI caused by the proposed Storage and Recovery Program. The Storage and Recovery Program applicant will develop mitigation measures pursuant to these requirements and incorporate them into their Storage and Recovery Program application. Upon approval by Watermaster, these mitigation measures will be incorporated into the Storage and Recovery Program storage agreement.

Watermaster will periodically review current and projected basin conditions, compare this information to the projected basin conditions assumed in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of related MPI mitigation requirements and measures in the Storage and Recovery Program storage agreements. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program storage agreements to mitigate MPI.

2.4.3 Adverse Impacts Due to a Storage and Recovery Program Must Be Mitigated

Adverse impacts include but are not limited to reductions in net recharge and Safe Yield and an increase in the groundwater discharge from the Chino North GMZ to the Santa Ana River contributing to a loss of Hydraulic Control. Watermaster will, as part of the Storage and Recovery Program application review process, make a projection of the program's expected impact on net recharge and Safe Yield and on the state of Hydraulic Control.

The 2018 SFI concluded the that the net recharge and Safe Yield of the basin would be reduced annually by about 2.0 percent (ranged from 1.5 to 2.4 percent) of the volume of water stored in a Storage and Recovery Program storage account. Watermaster will estimate the reduction in net recharge and Safe Yield for each Storage and Recovery Program and deduct it from water stored in each Storage and Recovery Program storage account to compensate for its impact on net recharge and Safe Yield.

Watermaster will review these impacts and develop mitigation requirements for the proposed Storage and Recovery Program. The Storage and Recovery Program applicant will develop mitigation measures pursuant to these requirements and incorporate them into their Storage and Recovery Program application. Upon approval by Watermaster, these mitigation measures will be incorporated into the Storage and Recovery Program storage agreement.

Watermaster will periodically review the current and projected net recharge loss rate and the state of Hydraulic Control, compare this information to the projected basin conditions assumed in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of the related mitigation measures and requirements in the Storage and Recovery Program storage agreement. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program storage agreements to mitigate impacts on net recharge and Safe Yield and on the state of Hydraulic Control.

2.5 Storage Agreement Application Process

As part of the development of an updated Storage Management Plan, environmental review will be conducted as to the impacts of a planned quantity of storage space reserved for the Parties' conjunctive-use activities and Metropolitan's DYYP. As a means of streamlining the process through which Parties apply for, receive approval of, and enter into storage agreements with Watermaster, the existing Form 8 Local Storage Agreements will be modified to be consistent with an "evergreen agreement" paradigm.

Within an "evergreen agreement" paradigm, the forms of the agreements, as revised, will allow for the quantities stored pursuant to the agreements to increase, during the term of the agreements, to cover the amount of water that each Party to an agreement places into storage, as shown in each Watermaster-approved annual Assessment Package. The evergreen agreements will be valid for the duration of the Peace Agreement and will be automatically adjusted upon Watermaster's approval of each subsequent Assessment Package so long as the cumulative amount of water in storage is less than the quantity reserved for the Parties' conjunctive-use operations and Metropolitan's DYYP (cumulatively, the FMSB) and Watermaster has made no finding that MPI is threatened to occur as a result of the increase in the quantity of water in storage.

2.6 Storage Management Plan Update

Watermaster will periodically review and update the SMP based on monitoring information obtained since the previous SMP was adopted, technology changes, and the "needs and requirements of the lands overlying the Chino Basin and the owners of the rights in the Safe Yield or Operating Safe Yield of the Basin."[19] The periodic review and update of the SMP will require the use of updated planning and hydrologic data and models, and it should be completed: at no less than a five-year frequency, when the Safe Yield is recalculated, or when Watermaster determines a review and update is warranted based new information and/or the needs of the Parties or the Basin.

The projected aggregate amount of water in managed storage by the Parties in 2056 (planning horizon of the 2018 SFI) is about 340,000 af. The impacts to the Basin and the Parties from

[19] Judgment, ¶12.

reducing managed storage below 340,000 af has not been estimated. Notwithstanding the SMP update frequency stated above, Watermaster should update the SMP at least five years before the aggregate amount of managed storage by the Parties is projected to fall below 340,000 af.

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Appendix A

2020 Storage Management Plan White Paper

Final 2020 Storage Management Plan White Paper

The objective of the 2020 Storage Management Plan white paper is to provide a concise compilation of technical storage management issues developed from the Storage Framework Investigation that should be considered in the 2020 Storage Management Plan. The draft 2020 Storage Management Plan white paper was distributed by the Chino Basin Watermaster on June 8, 2019 and it was reviewed at the June 20, 2019 Storage Management Plan workshop. The stakeholders were asked to provide comments on the draft white paper by July 5, 2019. These comments and Watermaster staff responses to them are included in Exhibit A attached herein. Some of those responses resulted in changes in the final white paper.

Background

Groundwater pumping rights in the Chino Basin were adjudicated in the 1970s and settled in the 1978 stipulated agreement (Judgment). The Judgment established a Watermaster to administer the decree under the court's continuing jurisdiction and empowered it to manage and control available storage capacity and to enter into agreements for the storage of water. As a prerequisite to implementing the Optimum Basin Management Program ("OBMP") the parties executed the Peace Agreement providing direction and guidance to the Watermaster on how storage should be prioritized and managed. The OBMP addresses the management of extraction, recharge, storage, recovery, and transfer of water. The prevailing standard for all operations is the avoidance of "undesirable results"—defined as "material physical injury"—under court approved management agreements executed contemporaneously and subsequent to the adoption of the OBMP Update in June 2020.[1]

Given the passage of twenty years since its approval, Watermaster has revisited the OBMP goals and objectives and plans to update the OBMP by June 2020. Updating the OBMP storage management plan is integral to the OBMP update. This background section provides the historical and institutional background for Watermaster's storage management activities, managed storage conditions, and groundwater management challenges impacted by managed storage activities.

Judgment

There is a significant amount of unused storage space in the Chino Basin. Groundwater in storage was estimated to have declined by about 1,600,000 af over the period 1922 through 1978, the starting point of the Judgment implementation. This decline of groundwater in storage was recognized in the Judgment,[2] and it requires that the use of this space be undertaken only under Watermaster control and regulation. Specifically, Judgment paragraphs 11 and 12 state:

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[1] The Optimum Basin Management Program can be found here: http://www.cbwm.org/rep_engineering.htm.

[2] Original judgment in Chino Basin Municipal Water District vs. City of Chino, et al., signed by Judge Howard B. Weiner, Case No. 164327. File transferred August 1989, by order of the Court, and assigned new case number RCV51010. The Restated Judgment can be found here:

"11. Available Ground Water Storage Capacity. There exists in Chino Basin a substantial amount of available ground water storage capacity which is not utilized for storage or regulation of Basin Waters[3]. Said reservoir capacity can appropriately be utilized for storage and conjunctive use of Supplemental Water[4] with Basin Waters. It is essential that said reservoir capacity utilization for storage and conjunctive use of Supplemental Water be undertaken only under Watermaster control and regulation, in order to protect the integrity of both such Stored Water[5] and Basin Water in storage and the Safe Yield[6] of Chino Basin.

12. Utilization of Available Ground Water Capacity. Any person or public entity, whether a party to this action or not, may make reasonable beneficial use of the available ground water storage capacity of Chino Basin for storage of Supplemental Water; provided that no such use shall be made except pursuant to written agreement with Watermaster, as authorized by Paragraph 28. In the allocation of such storage capacity, the needs and requirements of lands overlying Chino Basin and the owners of rights in the Safe Yield or Operating Safe Yield[7] of the Basin shall have priority and preference over storage for export."

These paragraphs establish Watermaster's control over the use of the storage space in the basin, require the accounting of Stored Water and Basin Water in storage, require accounting for the impacts of managed storage on Safe Yield and the prevention of unauthorized overdraft, require storing entities to obtain a storage agreement from Watermaster, and prioritize the use of storage space to meet the needs and requirements of the lands overlying the Chino Basin and of the Judgment parties over the use storage space to store water for export.

Judgment paragraphs 28 and 29 state:

"28. Ground Water Storage Agreements. Watermaster shall adopt, with the approval of the Advisory Committee, uniformly applicable rules and a standard form of agreement for storage of Supplemental Water, pursuant to criteria therefore set forth in Exhibit "I". Upon appropriate application by any person, Watermaster shall enter into such a storage agreement; provided that all such storage agreements shall first be approved by written order of the Court, and shall by their terms preclude operations which will have a substantial adverse impact on other producers.

29. Accounting for Stored Water. Watermaster shall calculate additions, extractions and losses and maintain an annual account of all Stored Water in Chino

https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=247

[3] Basin Water is a defined term. Please see Storage Framework Appendix D for its definition.

[4] Supplemental Water is a defined term. Please see Storage Framework Appendix D for its definition.

[5] Stored Water is a defined term. Please see Storage Framework Appendix D for its definition.

[6] Safe Yield is defined term. Please see Storage Framework Appendix D for its definition.

[7] Operating Safe Yield is a defined term. Please see Storage Framework Appendix D for its definition.

Basin, and any losses of water supplies or Safe Yield of Chino Basin resulting from such Stored Water."

These paragraphs require that Watermaster develop storage agreements for entities (Judgment parties and others) to store supplemental water in the basin, have the storage agreements approved by the Court, include terms in the storage agreements to ensure that storage "operations" do not cause "substantial adverse impact on other producers," and collect information to enable it to account for "all Stored Water in Chino Basin, and any losses of water supplies or Safe Yield of Chino Basin resulting from such Stored Water." Losses of water supplies or Safe Yield refer to storage losses and changes in Safe Yield caused by the management of storage.

Optimum Basin Management Program and the Peace Agreements

The Chino Basin OBMP[8] set forth agreed goals and objectives in 1999. A year later, the Peace Agreement[9] and the OBMP Implementation were approved by the Court in 2000. Many of the operable features of the OBMP were incorporated into the OBMP Implementation Plan,[10] conditioned on compliance with the Peace Agreement. The OBMP Implementation Plan is Exhibit B to the Peace Agreement. The Peace Agreement is an agreement among the Judgment parties to implement the OBMP and was reviewed in a programmatic environmental impact report (PEIR), certified by the Inland Empire Utilities Agency (IEUA) in July 2000. The OBMP Implementation Plan contains a storage management plan that was developed to allow the parties and other entities to utilize the unused storage space in the basin and mitigate potential Material Physical Injury[11] (MPI) from its use.

The OBMP storage management plan consists of managing groundwater production, replenishment, recharge, and storage such that total storage within the basin ranges from a low of 5,300,000 af to a high of 5,800,000 af. The following definitions are included in the OBMP Implementation Plan:

- Operational storage requirement (OSR) is the storage or volume in the Chino Basin that is necessary to maintain the Safe Yield. The OSR was estimated in the development of the OBMP to be about 5.3 million af. This storage value was set as the estimated storage in the basin in 1997.[12]
- Safe storage is an estimate of the maximum amount of storage space in the basin that can be used and not cause significant water-quality and/or high-groundwater related

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[8] The OBMP report is located here: http://www.cbwm.org/docs/engdocs/obmpphas1rep/Text/OBMP_Ph1_Report.pdf

[9] The Peace Agreement is located here: http://www.cbwm.org/docs/legaldocs/Peace_Agreement.pdf

[10] The OBMP Implementation Plan is Appendix B to the Peace Agreement, and it is located here: http://www.cbwm.org/docs/legaldocs/Implementation_Plan.pdf

[11] Material Physical Injury is a defined term. Please see Storage Framework Appendix D for its definition.

[12] Page 2-11, Optimum Basin Management Program, Phase I Report.

problems. Safe storage was estimated in the development of the OBMP to be about 5.8 million af.

- Safe storage capacity (SSC) is the difference between safe storage and the OSR. The allocation and use of storage space in excess of the SSC will preemptively require mitigation; that is, mitigation must be defined and resources committed to mitigation prior to its allocation and use.

Safe storage is equal to the OSR plus the SSC. The SSC was estimated during the development of the OBMP to be equal to the calculated decline in storage (400,000 af) during the base period (1965 through 1974) used to estimate the Safe Yield[13] in the Judgment plus an assumed additional decline in storage (100,000 af) in the intervening period up to the filing of the Judgment (1974 to 1978). The assumption underlying SSC was that it would be safe to store water in storage space that was recently created prior to implementing the Judgment.

Water occupying the SSC includes Carryover,[14] Excess Carryover,[15] Local Storage,[16] and Supplemental Waters stored by the parties. Water stored for Storage and Recovery Programs is also included in the SSC.[17] Carryover, Excess Carryover, Local Storage, and Supplemental Waters are referred to herein collectively as managed storage.

Subsequent to the approval of the PEIR in 2000, Watermaster and the Judgment parties developed revisions to the OBMP based on: new monitoring and borehole data collected since 1998, an improved hydrogeologic conceptualization of the basin and new numerical models that have improved the understanding of basin hydrology since 2000, and the need to expand the Chino Basin Desalters' (desalters) capacity to the 40,000 afy of groundwater pumping required in the OBMP Implementation Plan. Concurrently, the IEUA and Watermaster worked with the Santa Ana Regional Water Quality Control Board (Regional Board) to revise the total dissolved solids (TDS) and nitrate objectives for the Chino North Management Zone[18] to enable the reuse of the IEUA's recycled water without desalting it for a period estimated to be at least 30 years and without impairing the beneficial use of Chino Basin groundwater. One of the Regional Board's conditions for raising the TDS and nitrate objectives was the achievement of Hydraulic Control.[19]

Hydraulic Control is the reduction of groundwater discharge from the Chino North Management Zone to the Santa Ana River to less than 1,000 afy. Hydraulic Control is a goal of the OBMP with the intent of maintaining and enhancing the Safe Yield of the basin by ensuring that agricultural

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[13] Ibid, page 2-28 and Table 2-13

[14] Carryover Water is a defined term. Please see Storage Framework Appendix D for its definition.

[15] Excess Carryover Water is a defined term. Please see Storage Framework Appendix D for its definition.

[16] Local Storage Water is a defined term. Please see Storage Framework Appendix D for its definition.

[17] Storage and Recovery Program is a defined term. Please see Storage Framework Appendix D for its definition.

[18] The Chino North Management Zone consists of the combination of OBMP Management Zones 1, 2, and 3, exclusive the Prado Basin flood pool area.

[19] Hydraulic Control is a defined term. Please see Storage Framework Appendix D for its definition.

groundwater production in the southern half of the basin would be replaced by groundwater production for municipal uses as the land use in that area transitions from agricultural uses to urban uses. Through extensive investigations, it was determined that Hydraulic Control and the maintenance of Safe Yield required the expansion of desalter groundwater production to 40,000 afy and the reduction of basin water in storage by 400,000 af. These investigations included a recalculation of the total water in storage in the basin, based on the improved hydrogeologic understanding. The total storage in the Chino Basin for 2000 was estimated to be about 5,935,000 af, which is 635,000 af greater than that estimated for the OSR and 135,000 af greater than safe storage.[20]

The OBMP Implementation Plan was amended in 2007, and the Peace II Agreement enabled the expansion of the Chino Desalter pumping capacity from 20,000 afy to 40,000 afy. The technical investigations conducted to support the expansion of desalter groundwater production to 40,000 afy and the use of 400,000 af[21] of groundwater to partially meet the Replenishment Obligation for desalter production also indicated that the Safe Yield of the Chino Basin, at that time, was likely less than that stated in the Chino Basin Judgment and that it was projected to decline further in the future due to changes in cultural conditions in the watersheds overlying and tributary to the Chino Basin. The IEUA completed and subsequently certified a supplemental environmental impact report (SEIR) for the Peace II Agreement in 2010.

Starting in 2011, Watermaster began the technical effort to recalculate the Safe Yield. This work involved updating the hydrogeologic conceptual model of the basin, updating the historical hydrology, updating and recalibrating numerical models that simulate the surface and ground water hydrology of the Chino Basin area, and projecting the surface and groundwater response of the basin to future management plans that included storage management. This work is documented in *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement* (WEI, 2015; hereafter, Safe Yield report). The results of that work yielded a reassessment of the hydrology of the basin from 1961 through 2011 and projections of basin hydrology through 2050, based on the best available planning information. The conclusions of the Safe Yield report, related to storage management, are:

- On July 1, 2000, the total water in storage in the basin was about 5,935,000 af, inclusive of the 236,000 af of managed storage. This is about 635,000 af greater than the OSR of 5,300,000 af that was established in the OBMP Implementation Plan.

- Managed storage was projected to increase from 487,000 af in 2016 to about 663,000 af by 2030 (exceeding the SSC by 163,000 af) and decline thereafter to zero af by 2051. Managed storage was projected to be used to meet future replenishment obligations.

[20] Wildermuth Environmental, Inc., 2007. 2007 CBWM Groundwater Model Documentation and Evaluation of the Peace II Project Description.

[21] The 400,000 af of groundwater used for desalter replenishment is referred to as Re-Operation.

- Total storage was projected to fall below the OSR of 5.3 million af in 2041.

In 2017, the IEUA adopted an addendum to the Peace II SEIR, that provided a temporary increase in the SSC to 600,000 af through June 30, 2021 to provide time for Watermaster and the Judgment parties to update the OBMP storage management plan. The Storage Framework Investigation (2018) was conducted to provide technical support to update the storage management plan. In the absence of developing and adopting a new storage management plan by June 30, 2021, the SSC would again be limited to 500,000 af.

Storage Agreements

Since the Judgment came into effect, Watermaster developed rules and regulations, standard storage agreements, and related forms. There are three types of storage agreements that result in several types of storage accounts: Excess Carryover, Local Supplemental, Local Storage and Storage and Recovery. An Excess Carryover account includes a party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool[22] parties and Operating Safe Yield for Appropriative Pool[23] parties) and Basin Water acquired from other parties. A Local Supplemental Water account includes imported and recycled water that is recharged by a party and similar water acquired from other parties. A Storage and Recovery account includes Supplemental Water and is intended to produce a "broad and mutual benefit to the Parties to the Judgment." Watermaster tracks the puts, takes, losses, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process.

In evaluating applications for storage agreements, Watermaster must conduct an investigation to determine if the water stored and recovered under a proposed storage agreement will cause potential MPI to a party or the basin. If Watermaster determines that implementation of the proposed storage agreement will cause potential MPI, the applicant must revise its application so there is no MPI, or Watermaster must impose conditions in the storage agreement to ensure there is no MPI. Watermaster cannot approve a storage agreement that will result in MPI.

The parties, amongst themselves, are actively involved in water transfers of annual unproduced rights in the Safe Yield and water in their storage accounts. Watermaster has an application and review process for transfers that is similar to the storage agreement application process. Transfers are one way that the parties recover water held in storage accounts.

Existing Managed Storage and Proposed Storage and Recovery Programs

The Watermaster parties engage in conjunctive-use activities individually by storing Basin and Supplemental Waters that are in excess of their demands and subsequently recover that water as their individual needs arise. These activities collectively cause a temporary increase in managed storage. Table 1 summarizes the amount of water in managed storage by the Parties. Table 2-1 also shows the amount of water stored by the Metropolitan Water District of Southern California (Metropolitan) Dry-Year Yield Program (DYYP). The total volume of water in managed

[22] Overlying Non-Agricultural Pool is a defined term. Please see Storage Framework Appendix D for its definition.

[23] Appropriative Pool is a defined term. Please see Storage Framework Appendix D for its definition.

storage as of June 30, 2018 was about 581,100 af. Table 1 does not reflect the anticipated reductions in managed storage that will occur to offset unassessed desalter replenishment obligations.[24]

[24] The reconciliation of the water held in managed storage and the desalter replenishment obligation should be complete by the end of calendar year 2019, and the final Storage Management Plan report will include an updated version of this table that reflects these changes.

Table 1 Ending Balances in Managed Storage in the Chino Basin[1]
(af)

Fiscal Year Ending June 30	Appropriative Pool				Overlying Non-Agricultural Pool			Total Managed Storage by Parties	Dry Year Yield Program Storage[6]	Total Managed Storage
	Carryover[2]	Excess Carryover (ECO)[3]	Local Supplemental Storage[4]	Subtotal	Carryover[2]	Local Storage[5]	Subtotal			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8) = (7) + (4)	(9)	(10) = (9) + (8)
2000	28,911	170,342		199,253	6,541	31,031	37,572	236,825	0	236,825
2001	15,940	77,907	92,813	186,660	5,301	32,330	37,631	224,291	0	224,291
2002	13,521	70,103	87,801	171,425	5,285	33,727	39,012	210,437	0	210,437
2003	18,656	71,329	81,180	171,165	6,743	36,850	43,593	214,758	7,738	222,496
2004	21,204	70,503	80,963	172,670	7,177	40,881	48,058	220,728	26,300	247,028
2005	21,289	76,080	88,849	186,218	7,227	45,888	53,115	239,333	38,754	278,087
2006	32,062	56,062	86,170	174,294	7,227	49,178	56,405	230,699	58,653	289,352
2007	34,552	50,895	83,184	168,631	7,084	51,476	58,560	227,191	77,116	304,307
2008	41,626	83,962	81,520	207,108	6,819	45,248	52,067	259,175	74,877	334,052
2009	42,795	101,908	79,890	224,593	6,672	46,600	53,272	277,865	34,494	312,359
2010	41,263	120,897	90,133	252,293	6,934	47,732	54,666	306,959	8,543	315,502
2011	41,412	146,074	98,080	285,566	6,959	49,343	56,302	341,868	0	341,868
2012	42,614	209,981	116,138	368,733	6,914	13,993	20,907	389,640	0	389,640
2013	39,413	225,068	116,378	380,859	7,073	15,473	22,546	403,405	0	403,405
2014	41,708	231,679	125,052	398,439	6,478	12,812	19,290	417,729	0	417,729
2015	44,437	254,643	132,791	431,871	6,823	12,225	19,048	450,919	0	450,919
2016	45,683	279,757	144,012	469,452	7,195	9,949	17,144	486,596	0	486,596
2017	43,314	308,100	157,628	509,043	7,226	11,343	18,569	527,612	6,315	533,927
2018	40,390	308,056	170,168	518,614	7,198	13,894	21,092	539,706	41,380	581,086

1. Account balances are from Watermaster Assessment Packages and do not account for the desalter replenishment obligation or the change in Safe Yield.
2. The un-produced water in any year that may accrue to a member of the Non-Agricultural Pool or the Appropriative Pool and that is produced first each subsequent Fiscal Year or stored as Excess Carryover
3. Carryover Water which in aggregate quantities exceeds a party's share of Safe Yield in the case of the Non-Agricultural Pool, or the assigned share of Operating Safe Yield in the case of the Appropriative Pool, in any year.
4. Water imported to Chino Basin from outside the Chino Basin Watershed and recycled water.
5. Water held in a storage account pursuant to a Local Storage Agreement between a party to the Judgement and Watermaster. "Local Storage Agreement" means a Groundwater Storage Agreement for Local Storage.
6. Ending balance in the Dry Year Yield Program storage account.

Metropolitan's DYYP is the only active Storage and Recovery Program in the basin. The DYYP can store up to 100,000 af with maximum puts of 25,000 afy and maximum takes of 33,000 afy. As of July 1, 2018, there were 41,380 af stored in the DYYP account. The agreement that authorizes the DYYP will expire in 2028.

The IEUA and some of the parties are proposing the implementation of Storage and Recovery Programs, including the Chino Basin Water Bank and the Chino Basin Program (CBP). The operational parameters of these proposed programs are not yet defined; that said, the amount of storage space required has been identified to range between 200,000 and 300,000 af.

Current Groundwater Management Challenges and Their Relationship to Current Storage Management

The results of the groundwater modeling work reported in the Safe Yield report projected, based on the best planning information available at that time, that the total storage in the basin will likely be relatively stable through the mid to late 2020s, and by 2050, groundwater levels were projected to decline over a broad area ranging from about 65 feet in the Pomona area to 50 feet in the Jurupa Community Services District (JCSD) and Desalter II well field areas.[25] This decline in groundwater levels was projected to occur because managed storage was used to replenish desalter production and over-production by Appropriative Pool parties.

During the development of the *2013 Amendment to the 2010 Recharge Master Plan Update* (2013 RMPU), the JCSD asserted that declining groundwater levels in the areas around and in the JCSD and Chino Basin Desalter Authority (CDA) well fields contributed to declining groundwater pumping capacity at JCSD and CDA wells. Loss in production capacity in this area is likely due to hydraulic interference among the wells and could be mitigated by reducing pumping at these wells, spreading out production over a greater area, and/or by increased recharge located proximate and tributary to the JCSD and CDA well fields. The projected decline in groundwater levels after the mid to late 2020s is projected to further exacerbate pumping sustainability challenges in this part of the basin.

The existing storage management plan is based on fixed amounts of water in storage, and its technical basis is not supported by new information available after the storage management plan was first developed (1999). Review of this new information (developed since 1999), indicates that it is possible to expand the SSC to enable greater use of storage space. This new information includes an updated hydrogeologic conceptual model; 20 years of intensive monitoring of basin operations (not available in 1999), including monitoring the basin response as managed storage approached the SSC of 500,000 af; and groundwater model-based projections of the basin response to future management plans where the managed storage exceeded 500,000 af. Re-Operation will reduce the amount of Basin Water in storage by 400,000 af. The current storage management plan does not account for Re-Operation.

The new information developed since 1999 suggests that the unanticipated use of managed storage to meet future desalter and other replenishment obligations could cause potential MPI: it has the potential to exacerbate land subsidence and pumping sustainability challenges, impact net recharge and Safe Yield, increase groundwater discharge through the CCWF, cause a loss of Hydraulic Control, and change the direction and speed of the contaminant plumes. The OBMP storage management plan needs to be updated to include features that will ensure there is no MPI to a party or the basin caused by the conjunctive-use activities of the parties and Storage and Recovery Programs.

Storage Management Plan Requirements

This section describes the technical features of the recommended storage management plan, based on the requirements of the Judgment, the Peace Agreement, and the conclusions of the Storage Framework Investigation.

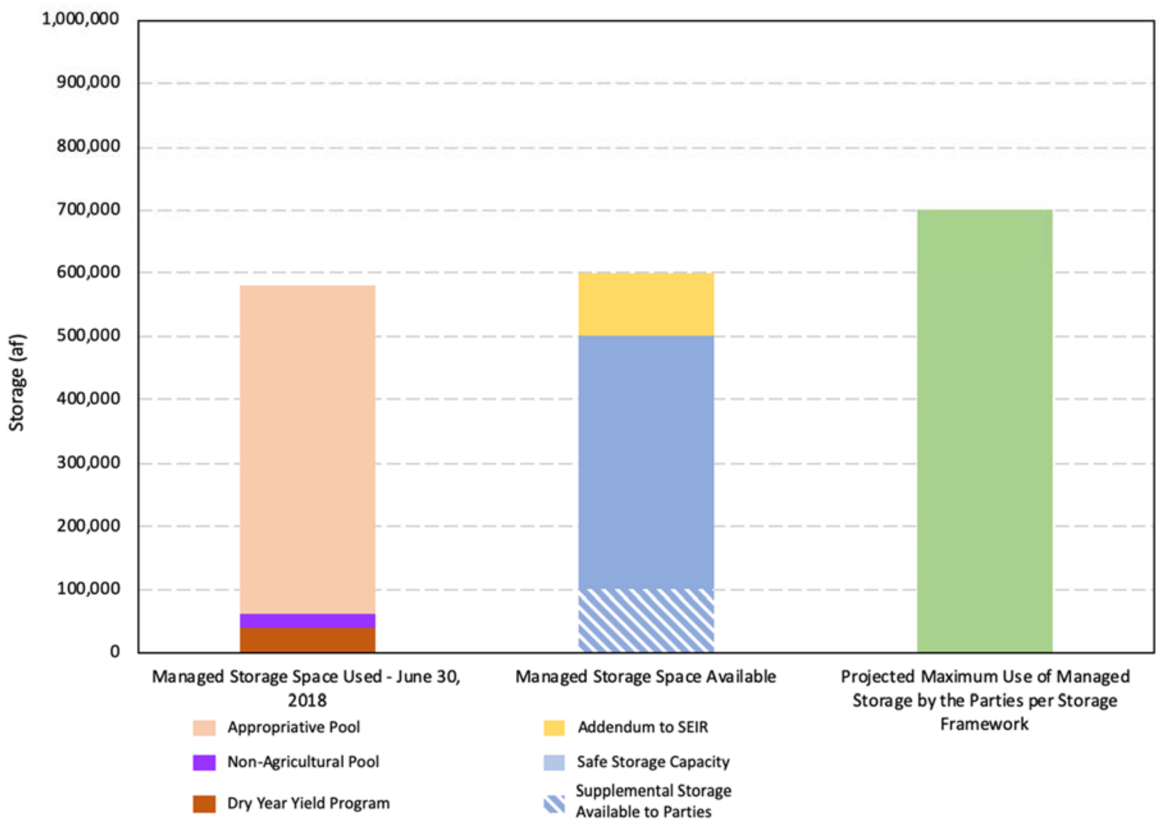
[25] See Figure 2-2 in the Storage Framework Investigation or Figure 7-5d from the Safe Yield report.

Allocation of Storage Space to the Parties Use of Managed Storage and Storage and Recovery Programs

The stakeholders desire to reserve storage space for the parties' individual uses and for Storage and Recovery Programs to provide certainty to their water supply planning and operations.

Based on the best available planning information provided by the parties in the Storage Framework Investigation, the parties' use of managed storage was projected to reach about 700,000 af in 2030 and decline monotonically thereafter. Therefore, it is logical to consider starting discussions for the parties use of managed storage with a limit of 700,000 af in the Storage Management Plan, and this will be adjusted in accordance with stakeholder input. Therefore, it is logical to consider establishing a limit for the parties' use of managed storage at 700,000 af in the Storage Management Plan. Figure 1 below compares the current use of managed storage to the storage space permitted per the Peace Agreement and the expected maximum use of managed storage by the parties.

Figure 1 Comparison of Managed Storage Space Used, Managed Storage Space Available and Projected Maximum Use of Managed Storage by the Parties



Alternatively, the Watermaster and the parties could establish a lower or higher limit, but additional engineering work will be required to assess the basin response and potential MPI for a higher limit.

The Storage Framework Investigation evaluated the use of 300,000 af of storage for Storage and Recovery Programs that was superimposed on the storage management activities of the parties. Therefore, it is logical to consider establishing an aggregate limit for all Storage and Recovery Programs at 300,000 af in the Storage Management Plan, and this limit will be adjusted in accordance with stakeholder input.

Reservation of Existing Spreading Basin Facilities to Satisfy Watermaster Recharge and Replenishment Obligations

The Judgment parties and IEUA, through the OBMP, have substantially increased the storm and supplemental water recharge capacity in the Chino Basin. The increase in supplemental water recharge capacity was done to ensure that Watermaster could meet its future recharge and replenishment obligations. Watermaster will include provisions in storage agreements that Watermaster will prioritize the use of spreading basins to satisfy Watermaster's recharge and replenishment obligations over the use of spreading basins for other uses.

Storage Management Activities of the Parties

Limitation of Transfers or Leases of Water Rights and Water Held in Managed Storage

Early in the OBMP implementation period Watermaster determined that transfers or leases of water rights and water held in managed storage (hereafter transfers) from parties that are situated such that they pump groundwater outside of MZ1 to parties that pump in MZ1 for *the purpose of replenishment* have the potential to cause MPI.

This limitation on transfers should be reconsidered if the land subsidence management plan for MZ1 includes consideration for such transfers, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan.

Mitigation of Reduced Net Recharge and Safe Yield

Currently, Watermaster assesses a 0.07 percent loss to storage accounts based on the estimated groundwater discharge from the Chino North Management Zone to the Santa Ana River. The Storage Framework Investigation demonstrated that storing water has the effect of reducing net recharge and Safe Yield. The Storage Framework Investigation estimate of reduced net recharge is inclusive of discharge from the Chino North Management Zone to the Santa Ana River. The reduction in net recharge caused by storage is an adverse impact.

There are two fundamental approaches to mitigate the reduction in net recharge caused by the parties' storage management activities:

- In the first approach, the reduction net recharge would be embedded in Safe Yield, and it would be implicitly allocated to Appropriative Pool parties, based on their pro rata share of Operating Safe Yield.

- In the second approach, the reduction in net recharge would be debited to the storage accounts of the storing parties in the Appropriative and Overlying Non-agricultural pools, based on each parties' amount of water in storage.

Watermaster and the parties need to determine which of the above approaches or variant of them to include in the storage management plan to ensure that the impact from the parties' storage management activities are considered and addressed.

Storage and Recovery Programs

Prioritization of Put and Take Operations in MZ2 and MZ3

Storage and Recovery programs are implemented through a series of “puts” and “takes” where water goes into storage during a put and is recovered from storage during a take. Based on the results of the Storage Framework Investigation, these put and takes should be prioritized to occur in MZ2 and MZ3 to avoid new land subsidence and interfering with land subsidence management in MZ1, to minimize pumping sustainability challenges, to minimize the impact of storage and recovery operations on solvent plumes, to preserve the state of Hydraulic Control, and to take advantage of the larger and more useful groundwater storage space in MZ2 and MZ3.

This spatial prioritization on puts and takes should be reconsidered if the land subsidence management plan for MZ1 includes consideration for Storage and Recovery programs, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan.

Evaluation of Storage and Recovery Program Impacts, MPI, and Mitigation

The intent of this provision is to reaffirm the requirements of Paragraph 12 of the Judgment and the Peace Agreement, as to the review of Storage and Recovery Program applications, and to require Storage and Recovery Program agreements to provide provisions that require Storage and Recovery Program proponents to cease or modify their operations if Watermaster determines, subsequent to Watermaster and Court approval of a Storage and Recovery Program storage agreement, that the proponent’s storage and recovery operations are causing or threaten to cause potential MPI. The potential MPIs to be addressed include but are not limited to: land subsidence, pumping sustainability, reductions in net recharge and safe yield, water quality impacts, shallow groundwater, and liquefaction.

Watermaster will review each Storage and Recovery Program application, estimate the surface and groundwater system response, prepare a report that documents the response and potential MPI, and develop mitigation measures to mitigate MPI caused by the proposed Storage and Recovery Program. Watermaster will incorporate these mitigation measures into the Storage and Recovery Program storage agreement.

Watermaster will periodically review current basin conditions, compare this information to the projected basin conditions prepared in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of related MPI mitigation requirements in the Storage and Recovery Program storage agreement. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program operations to mitigate MPI.

Hydraulic Control Impacts Due to a Storage and Recovery Program Must Be Mitigated

Watermaster will, as part of the Storage and Recovery Program application review process, make a projection of the program’s expected impact on the state of Hydraulic Control. Watermaster will review these impacts and develop mitigation requirements for the proposed Storage and

Recovery Program. These mitigation requirements will be incorporated into the Storage and Recovery Program storage agreement.

Watermaster should periodically review the state of Hydraulic Control and update projections of the state of Hydraulic Control, compare this information to the projected Hydraulic Control assessment prepared in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of the related mitigation requirements in the Storage and Recovery Program storage agreement. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program operations to mitigate impacts on the state of Hydraulic Control.

Storage Agreement Application Process

Watermaster and the parties should consider updating the storage agreement application process to incorporate changes in the technical features of storage management and to improve the efficiency of the application process.

Storage Management Plan Update

Watermaster should periodically review and update the storage management plan based on: monitoring information obtained since the previous storage management plan was adopted, technology changes, and the "needs and requirements of the lands overlying the Chino Basin and the owners of the rights in the Safe Yield or Operating Safe Yield of the Basin." The assessment of technical storage management concerns and opportunities requires the use of updated hydrologic data and models and can be completed efficiently with the recalculation of Safe Yield on a ten-year frequency or more frequently.

The projected aggregate amount of managed storage by the parties in 2050 (planning horizon of the Storage Framework Investigation) is about 340,000 af. Notwithstanding the update frequency recommended above, Watermaster should consider updating the storage management plan before the aggregate amount of managed storage by the parties falls below 340,000 af if not done earlier in a periodic update of the storage management plan.

Exhibit A

Comments and Responses on the June 8, 2019 Storage Management Plan White Paper

Monte Vista Water District

Comment No. 1. Page 1, first full paragraph, text that reads: "As a prerequisite to implementing the Optimum Basin Management Program ("OBMP") the parties executed an *agreement* providing direction and guidance to the Watermaster on how storage should be prioritized and managed." Emphasis added. ***MVWD comment reads: "please state agreement and year."***

Response. The agreement referred to is the 2000 Peace Agreement. Text modified to refer to the Peace Agreement.

Comment No. 2. Page 1, third full paragraph, , text that reads: "*Groundwater storage* was estimated to have declined by about 1,600,000 af over the period 1922 through 1978, the starting point of the Judgment implementation. This decline in *groundwater storage* was recognized in the Judgment, and it requires that the use of this space be undertaken only under Watermaster control and regulation." Emphasis added. ***MVWD comment reads: Storage did not decline, groundwater in storage declined" and "change to "groundwater in storage", respectively.***

Response. Text changed as requested.

Comment No. 3. Page 7, second full paragraph, text that reads: "The IEUA and some of the parties are proposing the implementation of Storage and Recovery Programs, including the Chino Basin Water Bank, the Santa Ana River Conservation and Conjunctive-Use Program (SARCCUP), and the Chino Basin Program (CBP). ***MVWD comment reads: " It may be more contemporary to now delete the reference to SARCCUP."***

Response. Text changed as requested.

Comment No. 4. Page 7, last paragraph continuing to top of page 8, text that reads: "The results of the groundwater modeling work reported in the Safe Yield report projected, based on the best planning information available at that time, that the total storage in the basin will likely be relatively stable through the mid to late 2020s, and by 2050, groundwater levels were projected to decline over a broad area ranging from about -65 feet in the Pomona area to -50 feet in the Jurupa Community Services District (JCSD) and Desalter II well field areas." ***MVWD comment reads: "Described as a decline, the negative signs cause a double negative."***

Response. Text changed to remove the negative signs.

Comment No. 5. Page 8, third full paragraph, text that reads: "The new information developed since 1999 suggests that the unanticipated use of managed storage to meet future desalter and other replenishment obligations could cause potential MPI: it has the potential to exacerbate land subsidence and pumping sustainability challenges, impact net recharge and Safe Yield, increase groundwater discharge through the CCWF, cause a loss of Hydraulic Control, and change the direction and speed of the contaminant plumes." ***MVWD comment reads: "Based on my 6/20 discussion with Andy I think he understands that it may be more clear if the phrase 'to meet future desalter and other replenishment obligations' is removed".***

Response. The text was not changed.

Comment No. 6. Page 9, last paragraph, text that reads: "Therefore, it is logical to consider establishing a limit for the parties' use of managed storage at 700,000 af in the Storage Management Plan." ***MVWD comment reads: "Change 'logical' to "conducive". 'Logical' seems to give an 700k an aura of certainty higher that it deserves."***

Response. The text was changed to read: "Therefore, it is logical to consider starting discussions for the parties use of managed storage with a limit of 700,000 af in the Storage Management Plan, and this will be adjusted in accordance with stakeholder input."

Comment No. 7. Page 10, second full paragraph, text that reads: "Therefore, it is logical to consider establishing an aggregate limit for all Storage and Recovery Programs at 300,000 af, provided that the aggregate storage limit for parties does not exceed 700,000 af." ***MVWD comment reads: "This sentence/conclusion should probably be put on hold pending on how Watermaster stakeholders decide to be addressed, including mitigation measures."***

Response: Note that the subsequent sentence in the text reads: "Watermaster and the parties could establish a lower or higher aggregate storage limit for Storage and Recovery Programs, but additional engineering work will be required to assess the basin response and MPI for a higher aggregated storage limit." This sentence responds to the comment. That said, the text was changed to read: "Therefore, it is logical to consider establishing an aggregate limit for all Storage and Recovery Programs at 300,000 af in the Storage Management Plan, and this limit will be adjusted in accordance with stakeholder input."

Comment No. 8. Page 11, first paragraph, text that reads: "Watermaster has the right to the use existing spreading basins to meet its recharge and replenishment obligations over the use of these facilities by any party or person to accomplish supplemental water recharge." ***MVWD comment reads: "Is it WM or WM stakeholders who have invested into the basins that have this right?"***

Response: The OBMP identified that there was not enough supplemental water recharge capacity to meet future replenishment obligations. OBMP implementation led to the construction of recharge improvements that increased supplemental water recharge capacity for replenishment. The intent of constructing the recharge improvements is specific to increasing storm water recharge and providing Watermaster recharge capacity for replenishment. The text has been changed to read that Watermaster will include provisions in storage agreements that Watermaster will prioritize the use of spreading basins to satisfy Watermaster's recharge and replenishment obligations over the use of spreading basins for other uses.

Comment No. 9. Page 11, second paragraph, text that reads: “Early in the OBMP implementation period Watermaster determined that transfers or leases of water rights and water held in managed storage (hereafter transfers) from parties that are situated such that they pump groundwater outside of MZ1 to parties that pump in MZ1 have the potential to cause MPI.” ***MVWD comment reads: “Transfers/leases into MZ1 do not have the potential to cause MPI. It can be said that physical pumping/production to some level has the potential to cause MPI. Transfer/leases and pumping/production are not one in the same.”***

Response: The text will be revised to improve clarity and will read: “Early in the OBMP implementation period Watermaster determined that transfers or leases of water rights and water held in managed storage (hereafter transfers) from parties that are situated such that they pump groundwater outside of MZ1 to parties that pump in MZ1 *for the purpose of replenishment* have the potential to cause MPI.”

San Antonio Water Company

Comment No. 1. Page 1, first full paragraph, text that reads: “As a prerequisite to implementing the Optimum Basin Management Program (“OBMP”) the parties executed an <u>*agreement*</u> providing direction and guidance to the Watermaster on how storage should be prioritized and managed.” Emphasis added. ***SAWC comment reads: “Would you please direct me to document and page where this is referenced?”***

Response. The agreement referred to is the 2000 Peace Agreement. Text will be modified to refer to the Peace Agreement.

Comment No. 2. Page 2, citation to Judgment Paragraph 28. ***SAWC comment reads: “Storage agreements are currently not going to court...correct? Are there concerns at this time because of that?”***

Response: There are no concerns at time. The present storage agreement, procedures, and forms have been approved by the Court through the approval of the Peace Agreement and Watermaster Rules and Regulations.

Comment No. 3. Page 8, third full paragraph, text that reads: “The new information developed since 1999 suggests that the unanticipated use of managed storage to meet future desalter and other replenishment obligations could cause potential MPI: it has the potential to exacerbate land subsidence and pumping sustainability challenges, impact net recharge and Safe Yield, increase groundwater discharge through the CCWF, cause a loss of Hydraulic Control, and change the direction and speed of the contaminant plumes. The OBMP storage management plan needs to be updated to include features that will ensure there is no MPI to a party or the basin caused by the conjunctive-use activities of the parties and Storage and Recovery Programs. ***” SAWC comment reads: “I need further understanding. If the parties are not pumping the water and utilizing it as a transfer, why is there a problem? Wasn't this thought about when the desalter replenishment obligation was discussed? Didn't WEI do a study on the impact of this decision? Is it because the re-op schedule was changed?***

Response: The original storage management plan was developed for the OBMP in 1999, based on the best available information available to Watermaster. The overlying land and water use practices have evolved over time, and we have continued to refine our understanding of the Basin and its responsiveness to all known variables. Even since Re-Operation was approved by the Court in 2007, the collection and analysis of new data and the application of technology improvements have provided Watermaster and the parties the ability to develop a more refined evaluation of the potential the impacts to the basin from specific recharge, pumping, and storage activities. It is true, the length of time water is held in storage and the rate and location of its withdrawal have implications. Potential impacts attributable to proposed changes in the current baseline will be addressed using our improved knowledge and analytical tools and incorporated into the 2020 Storage Management Plan.

Comment No. 4. Page 11 first full paragraph, text that reads: "Watermaster has the right to the use existing spreading basins to meet its recharge and replenishment obligations over the use of these facilities by any party or person to accomplish supplemental water recharge." ***SAWC comment reads: "Why does Watermaster get first use of basin? Didn't the parties pay for the basin. Why is SAWCo's water not given priority over someone pumping rights they don't have?"***

Response: As to priority of use of the recharge basins, please see response to MVWD Comment No. 8. As to the question: "*Why is SAWCo's water not given priority over someone pumping rights they don't have?"* This is not a storage management plan question

Comment No. 5. Page 11, first bulleted item following the fifth paragraph, text that reads: "In the first approach, the reduction net recharge would be embedded in Safe Yield, and it would be implicitly allocated to Appropriative Pool parties, based on their pro rata share of Operating Safe Yield." SAWC's comment reads : ***"Other options need to be considered such as time frame for storage if it makes sense."***

Response: The white paper refers to bookends on the approach to identify and mitigate a reduction in Safe Yield caused by the use of managed storage. The impact on Safe Yield from the duration that water is held in managed storage is included the bookend approaches and any variants of them.

Overlying Agricultural Pool

Comment No. 1. Page 1, first paragraph, text that reads: " The prevailing standard for all operations is the avoidance of "undesirable results"—defined as "material physical injury"—under court approved management agreements executed contemporaneously and subsequent to the adoption of the OBMP Update in June 2020. " ***Ag pool comment reads: "MPI is legally defined by Watermaster legal documents (court approved management agreements) and it does not include "undesirable results." Ag Pool supports this concept however and recommends that WM bolster this in light of the defined term."***

No response required.

Comment No. 2. Page 3, first bullet after the second full paragraph, text that reads: "Operational storage requirement (OSR) is the storage or volume in the Chino Basin that is necessary to maintain the Safe Yield. The OSR was estimated in the development of the OBMP to be about 5.3 million af. This storage value was set as the estimated storage in the basin in 1997. " ***Ag Pool comment reads: "Should there be a discussion on the relevance of OSR and SSC for the OBMP Update?"***

Response: The relevancy of the original OBMP storage management plan will be described in the 2020 Storage Management Plan. The 2020 Storage Management Plan will be incorporated into the OBMP update.

Comment No. 3. Page 4, first full paragraph, text that reads: "Water occupying the SSC includes Carryover, Excess Carryover, Local Storage, and Supplemental Waters stored by the parties. Water stored for Storage and Recovery Programs is also included in the SSC. Carryover, Excess Carryover, Local Storage, and Supplemental Waters are referred to herein collectively as managed storage. " ***Ag Pool comment reads: "Why is this (managed storage) defined that way?"***

Response: Managed storage refers to all water that is stored by virtue of the management activities of the parties and Storage and Recovery Program entities, and it includes carryover water.

Comment No. 4. Page 4 last paragraph continuing onto Page 5, text that reads: "These investigations included a recalculation of the total water in storage in the basin, based on the improved hydrogeologic understanding. The total storage in the Chino Basin for 2000 was estimated to be about 5,935,000 af, which is 635,000 af greater than that estimated for the OSR and 135,000 af greater than safe storage." ***Ag Pool Comment reads: "This should be explained. Consider adding a technical rationale for the revised total storage and reference where this rationale was developed."***

Response: The engineering work for the Peace II Agreement produced a new hydrogeologic conceptual model that resulted in an updated estimate of the water in storage in 2000. A footnote will be added to state this and provide a reference to the documentation for it.

Comment No. 5. Page 5, second bullet after the second full paragraph, text that reads: "Managed storage was projected to increase from 487,000 af in 2016 to about 663,000 af by 2030 (exceeding the SSC by 163,000 af) and decline thereafter to zero af by 2051. Managed storage was projected to be used to meet future replenishment obligations." ***Ag Pool comment: "When and how will the storage be used? Should there be a schedule?"***

Response. The cited text refers to description of how managed storage is projected to change based on the work done to recalculate the Safe Yield and reported in *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement* (WEI, 2015). The water in managed storage was assumed to be used for replenishment purposes based on the projected aggregate replenishment obligation. No schedule was recommended for the use of managed storage in the report. The concept of a schedule should be addressed by the parties in the development of the 2020 Storage Management Plan.

Comment No. 6. Page 6, first paragraph, text that reads: "Since the Judgment came into effect, Watermaster developed rules and regulations, standard storage agreements, and related forms. There are three types of storage agreements that result in several types of storage accounts: Excess Carryover, Local Supplemental, Local Storage and Storage and Recovery. An Excess Carryover account includes a party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool parties and Operating Safe Yield for Appropriative Pool parties) and Basin Water acquired from other parties. A Local Supplemental Water account includes imported and recycled water that is recharged by a party and similar water acquired from other parties. A Storage and Recovery account includes Supplemental Water and is intended to produce a "broad and mutual benefit to the Parties to the Judgment." Watermaster tracks the puts, takes, losses, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process." ***Ag Pool comment reads: "Should the different storage accounts be valued and used appropriately?"***

Response: This question should be addressed by the parties in the development of the 2020 Storage Management Plan.

Comment No. 7. Page 6, second paragraph, text that reads: "In evaluating applications for storage agreements, Watermaster must conduct an investigation to determine if the water stored and recovered under a proposed storage agreement will cause MPI to a party or the basin. If Watermaster determines that implementation of the proposed storage agreement will cause MPI, the applicant must revise its application so there is no MPI, or Watermaster must impose conditions in the storage agreement to ensure there is no MPI. Watermaster cannot approve a storage agreement that will result in MPI." ***Ag Pool comment reads: "What about storage absent agreements? Is it assumed that is MPI?"***

Response: The paragraph describes an agreement approval process. Currently, all storage accounts have agreements in place.

Comment No. 8. Page 6, third paragraph, text reads: "The parties, amongst themselves, are actively involved in water transfers of annual unproduced rights in the Safe Yield and water in their storage accounts. Watermaster has an application and review process for transfers that is similar to the storage agreement application process. Transfers are one way that the parties recover water held in storage accounts." ***Ag Pool comment reads: "Should the management plan curtail these? Should the parties be on notice that the ability to use a transfer is conditional on Watermaster's continued finding that removal of water held in storage will not cause MPI?"***

Response: Watermaster has an application and review process for transfers that is similar to the storage agreement application process. If Watermaster determines that a proposed transfer will cause MPI, the applicant must revise its application so there is no MPI, or Watermaster must impose conditions on the transfer to ensure there is no MPI. Watermaster cannot approve a transfer that will result in MPI. These questions should be addressed by the parties in the development of the 2020 Storage Management Plan.

Comment No. 9. Page 6, fourth paragraph, text that reads: "Table 1 does not reflect the anticipated reductions in managed storage that will occur to offset unassessed desalter replenishment obligations.[23]" ***Ag Pool comment reads: "Why not? Where is that analysis?"***

Response. See footnote 23 in the June 8th initial draft of the 2020 Storage Management Plan White Paper (footnote 24 in the July 18th final draft). Watermaster is the process of updating assessment packages from prior years pursuant to the Court order that approved the Safe Yield for the period 2011 through 2020. It is anticipated that the assessment package update will be completed within the calendar year. Table 1 will be updated after the assessment packages are updated.

Comment No. 10. Page 7, first paragraph, text that reads: "Metropolitan's DYYP is the only active Storage and Recovery Program in the basin. The DYYP can store up to 100,000 af with maximum puts of 25,000 afy and maximum takes of 33,000 afy. As of July 1, 2018, there were 41,380 af stored in the DYYP account. The agreement that authorizes the DYYP will expire in 2028." ***Ag Pool comment reads: "Should all storage be managed like this one? Why or why not?"***

Response: These questions should be addressed by the parties in the development of the 2020 Storage Management Plan.

Comment No. 11. Page 7, second paragraph, text that reads: "The IEUA and some of the parties are proposing the implementation of Storage and Recovery Programs, including the Chino Basin Water Bank, the Santa Ana River Conservation and Conjunctive-Use Program (SARCCUP), and the Chino Basin Program (CBP). The operational parameters of these proposed programs are not yet defined; that said, the amount of storage space required has been identified to range between 200,000 and 300,000 af." ***Ag Pool comment reads: "What would be the impact. What are the proposed best management practices for this type of use?"***

Response: Absent specific proposals for these proposed Storage and Recovery Programs, the Ag Pool questions cannot be answered. The CBP is currently being formulated, and the Ag Pool questions will be answered in detail in early 2020.

Comment No. 12. Page 8, first full paragraph, text that reads: "During the development of the 2013 Amendment to the 2010 Recharge Master Plan Update (2013 RMPU), the JCSD asserted that declining groundwater levels in the areas around and in the JCSD and Chino Basin Desalter Authority (CDA) well fields contributed to declining groundwater pumping capacity at JCSD and CDA wells. Loss in production capacity in this area is likely due to hydraulic interference among the wells and could be mitigated by reducing pumping at these wells, spreading out production over a greater area, and/or by increased recharge located proximate and tributary to the JCSD and CDA well fields. The projected decline in groundwater levels after the mid to late 2020s is projected to further exacerbate pumping sustainability challenges in this part of the basin." ***Ag Pool comment: "Will these types of techniques be required in the plan?"***

Response. This question should be addressed by the parties in the development of the 2020 Storage Management Plan.

Comment No. 12. Page 8, second full paragraph that reads: "The existing storage management plan is based on fixed amounts of water in storage, and its technical basis is not supported by new information available after the storage management plan was first developed (1999). Review of this new information (developed since 1999), indicates that it is possible to expand the SSC to enable greater use of storage space. This new information includes an updated hydrogeologic conceptual model; 20 years of intensive monitoring of basin operations (not available in 1999), including monitoring the basin response as managed storage approached the SSC of 500,000 af; and groundwater model-based projections of the basin response to future management plans where the managed storage exceeded 500,000 af. Re-Operation will reduce the amount of Basin Water in storage by 400,000 af. The current storage management plan does not account for Re-Operation. ***Ag Pool comment reads: "Detail of this is warranted."***

Response: Additional detail will be provided in draft Storage Management Plan document when it is prepared.

Comment No. 13. Page 8, third full paragraph that reads: "The new information developed since 1999 suggests that the unanticipated use of managed storage to meet future desalter and other replenishment obligations could cause potential MPI: it has the potential to exacerbate land subsidence and pumping sustainability challenges, impact net recharge and Safe Yield, increase groundwater discharge through the CCWF, cause a loss of Hydraulic Control, and change the direction and speed of the contaminant plumes. The OBMP storage management plan needs to be updated to include features that will ensure there is no MPI to a party or the basin caused by the conjunctive-use activities of the parties and Storage and Recovery Programs." ***Ag Pool comment reads: "What are the proposed management techniques to avoid this?"***

Response: The management features/requirements to avoid MPI are described in the 2020 Storage Management Plan White Paper, following the cited text, and they will be included in the Storage Management Plan.

Comment No. 14. Page 9, second paragraph that reads: "Based on the best available planning information provided by the parties in the Storage Framework Investigation, the parties' use of managed storage was projected to reach about 700,000 af in 2030 and decline monotonically thereafter. Therefore, it is logical to consider establishing a limit for the parties' use of managed storage at 700,000 af in the Storage Management Plan." ***Ag Pool comment reads: "This seems a bit high and not specific enough to each pumper. An itemized list of each parties desire for storage would be useful. What the parties lay claim to cannot be used by water bankers including IEUA for their grant funding. Water bankers are going to want absolute certainty in what they can bank.***

Response: These comments should be addressed by the parties in the development of the 2020 Storage Management Plan.

Comment No. 15. Page 10, first paragraph that reads: "Alternatively, the Watermaster and the parties could establish a lower or higher limit, but additional engineering work will be required to assess the basin response and MPI for a higher limit." ***Ag Pool comment reads: "Why wouldn't we do that now?"***

Response: This question should be addressed by the parties in the development of the 2020 Storage Management Plan.

Comment No. 16. Page 10, second paragraph, text that reads: "The Storage Framework Investigation evaluated the use of 300,000 af of storage for Storage and Recovery Programs that was superimposed on the storage management activities of the parties. Therefore, it is logical to consider establishing an aggregate limit for all Storage and Recovery Programs at 300,000 af, provided that the aggregate storage limit for parties does not exceed 700,000 af. Watermaster and the parties could establish a lower or higher aggregate storage limit for Storage and Recovery Programs, but additional engineering work will be required to assess the basin response and MPI for a higher aggregated storage limit." ***Ag Pool comment reads: "Again, should we do pumper and location specific analysis?"***

Response: An MPI analysis is required for each Storage and Recovery Program proposal, and they will include a "pumper and location-specific analysis."

Comment No. 17. Page 11, first paragraph, text that reads: "The Judgment parties and IEUA, through the OBMP, have substantially increased the storm and supplemental water recharge capacity in the Chino Basin. The increase in supplemental water recharge capacity was done to ensure that Watermaster could meet its future recharge and replenishment obligations. Watermaster has the right to the use existing spreading basins to meet its recharge and replenishment obligations over the use of these facilities by any party or person to accomplish supplemental water recharge." ***Ag Pool comment reads: "Why is this important and should it be developed further?"***

Response: This is important because Storage and Recovery Program agreements need to specify that Watermaster has priority use of the existing spreading basins for its recharge and replenishment obligations over the use of these facilities for storage and recovery operations. The intent is to avoid conflicts between the recharge capacity required by Watermaster to fulfill its obligations under the Judgment and the desire of Storage and Recovery Program proponents to use the same existing recharge facilities to conduct recharge for their storage and recovery programs. The need to develop this further should be addressed by the parties in the development of the 2020 Storage Management Plan.

Comment No. 18. Page 11, Second and third paragraphs, text that reads: "Early in the OBMP implementation period Watermaster determined that transfers or leases of water rights and water held in managed storage (hereafter transfers) from parties that are situated such that they pump groundwater outside of MZ1 to parties that pump in MZ1 have the potential to cause MPI. No such transfers have occurred since the OBMP was implemented in 2000. This limitation on transfers should be reconsidered if the land subsidence management plan for MZ1 includes consideration for such transfers, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan." ***Ag Pool comment reads: "Why not include these requirements and potential uses in this plan? Additional details, analyses and monitoring would be needed to evaluate."***

Response: This requirement will be included in the 2020 Storage Management Plan. The ongoing monitoring and analysis for land subsidence and the implementation of future land subsidence plans will provide the information necessary to update the requirement.

Comment No. 19. Page 11, last paragraph, text that reads: "Watermaster and the parties need to determine which of the above approaches or variant of them to include in the storage management plan to ensure their storage management activities do not cause MPI." ***Ag Pool comment reads: "What does Wildermuth (the expert) recommend? Should those that benefit the most pay the most?***

Response: The specific approach in allocating mitigation liability for storage induced changes in net recharge and Safe Yield should be discussed and addressed by the parties.

Comment No. 20. Page 12, second paragraph, text that reads: "This limitation on puts and takes should be reconsidered if the land subsidence management plan for MZ1 includes consideration for Storage and Recovery programs, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan." ***Ag Pool comment reads: "What does Wildermuth recommend as the tool to accomplish this? This needs further evaluation during development of the plan and continued validation and adjustment during operations on annual basis."***

Response: This management requirement will be described in greater detail in the draft 2020 Storage Management Plan.

Comment No. 21. Page 12, third paragraph, text that reads: "The intent of this provision is to reaffirm the requirements of Paragraph 12 of the Judgment and the Peace Agreement, as to the review of Storage and Recovery Program applications, and to require Storage and Recovery Program agreements to provide provisions that require Storage and Recovery Program proponents to cease or modify their operations if Watermaster determines, subsequent to Watermaster and Court approval of a Storage and Recovery Program storage agreement, that the proponent's storage and recovery operations are causing or threaten to cause MPI. The potential MPI to be addressed include but are not limited to: land subsidence, pumping sustainability, reductions in net recharge and safe yield, water quality impacts, shallow groundwater, and liquefaction." ***Ag Pool comment reads: "Propose abandonment of the Watermaster rebuttable presumption of no MPI."***

Response: This comment should be addressed by the parties in the development of the 2020 Storage Management Plan.

Comment No. 22. Page 12, third paragraph, text that reads: "Watermaster will review each Storage and Recovery Program application, estimate the surface and groundwater system response, prepare a report that documents the response and potential MPI, and develop mitigation measures to mitigate MPI caused by the proposed Storage and Recovery Program. Watermaster will incorporate these mitigation measures into the Storage and Recovery Program storage agreement." ***Ag Pool comment reads: "How will this requirement be reflected in the plan?"***

Response: It will be explicitly stated. This requirement is in the Peace Agreement.

Comment No. 23. Page 12, fifth paragraph, text that reads: "Watermaster will periodically review current basin conditions, compare this information to the projected basin conditions prepared in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of related MPI mitigation requirements in the Storage and Recovery Program storage agreement. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program operations to mitigate MPI." ***Ag Pool comment reads: Will this be required by the plan?***

Response: Yes.

Comment No. 24. Page 13, first full paragraph, text that reads: "Watermaster should periodically review the state of Hydraulic Control and update projections of the state of Hydraulic Control, compare this information to the projected Hydraulic Control assessment prepared in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of the related mitigation requirements in the Storage and Recovery Program storage agreement. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program operations to mitigate impacts on the state of Hydraulic Control." ***Ag Pool comment: "Define "periodically." The Ag Pool proposes that this be done on an annual basis and no less than every two years.***

Response: This management requirement will be described in greater detail in the draft 2020 Storage Management Plan.

Comment No. 25. Page 13, second full paragraph, text that reads: "Watermaster and the parties should consider updating the storage agreement application process to incorporate changes in the technical features of storage management and to improve the efficiency of the application process." ***Ag Pool comment reads: "Why not require it now and include it in the plan?"***

Response: This comment should be addressed by the parties in the development of the 2020 Storage Management Plan.

Comment No. 26. Page 13, third full paragraph, text that reads: "Watermaster should periodically review and update the storage management plan based on: monitoring information obtained since the previous storage management plan was adopted, technology changes, and the "needs and requirements of the lands overlying the Chino Basin and the owners of the rights in the Safe Yield or Operating Safe Yield of the Basin." The assessment of technical storage management concerns and opportunities requires the use of updated hydrologic data and models and can be completed efficiently with the recalculation of Safe Yield on a ten-year frequency or more frequently." ***Ag Pool comment reads: "Propose that Wildermuth define when this would be necessary and provide advice. Define "periodically."***

Response: This management requirement will be described in greater detail in the draft 2020 Storage Management Plan.

Comment No. 27. Page 13, fourth full paragraph, text that reads: "The projected aggregate amount of managed storage by the parties in 2050 (planning horizon of the Storage Framework Investigation) is about 340,000 af. Notwithstanding the update frequency recommended above, Watermaster should consider updating the storage management plan before the aggregate amount of managed storage by the parties falls below 340,000 af if not done earlier in a periodic update of the storage management plan." ***Ag Pool comment reads: "Consider adding a buffer of additional AF to provide time to adjust. Consider other potential factors as well, such a rate of decline and projected time of reaching this untested threshold. Repeat that the periodic update should be conducted on an annual basis. not on a regular basis to ensure that it does not fall below. How will storage be allocated among the parties. What happens if everyone wants 100k AF? Where is the substance of the plan?***

Response: As to the direct comment, the intent of the periodic review and update of the Storage Management Plan is to track the amount of water in managed storage, update the plan as necessary to avoid MPI, and to test the efficacy of the 340,000 af threshold. The frequency of the Storage Management Plan review and update will be established to ensure no MPI from the use of managed storage. This management requirement will be described in greater detail in the draft 2020 Storage Management Plan. The answers to the questions "How will storage be allocated among the parties. What happens if everyone wants 100k AF?" and "Where is the substance of the plan?" should be addressed by the parties in the development of the 2020 Storage Management Plan.

Overlying Non-Agricultural Pool

Comment No. 1. Background section, ***Overlying Non-ag Pool comment reads: "In this section, the report says that as a prerequisite to implementing the OBMP, "the parties executed an agreement." Which agreement does this refer to? Which parties executed it?***

Response. The agreement referred to is the 2000 Peace Agreement. Text will be modified to refer to the Peace Agreement.

Comment No. 2. Judgment section, ***Overlying Non-ag Pool comment reads: "In this section, the draft says that groundwater storage "was estimated" to have declined by about 1,600,000 af over the period from 1922 through 1978. Who made this estimate? When? What is the source for this statement?***

Response: The change in storage was reported in *2013 Chino Basin Groundwater Model Update and Recalculation of Safe Yield Pursuant to the Peace Agreement* (WEI, 2015).

Comment No. 3. Judgment section, ***Overlying Non-ag Pool comment reads: "In this section, the draft says that Section 11 and Section 12 of the Judgment require that use of storage be undertaken only under Watermaster control and regulation. Section 11 and Section 12 apply only to Supplemental Water. Is there a basis in the Judgment*** **for control or regulation by Watermaster of carryover water? What is the basis?**

Response: Watermaster does not require agreements for carryover. Paragraph 7 of Exhibit "G" (Overlying (Non-Agricultural) Pool Pooling Plan) and Paragraph 12 of Exhibit "H" (Appropriative Pool Pooling Plan) to the Restated Judgment both require a storage agreement with Watermaster as a condition of storing excess carryover.

Comment No. 4. Judgment section, **Overlying Non-ag Pool comment reads: "In this section, the draft says that Section 28 requires Watermaster to develop and administer storage agreements for Supplemental Water. Section 28 requires Watermaster to administer Supplemental Water, but does not require or authorize Watermaster to develop or administer storage agreements for carryover water. Is there a basis in the Judgment for storage agreements for carryover water? What is the basis?**

Response: See response to Comment No. 3 above.

Comment No. 5. Storage Agreement section, **Overlying Non-ag Pool comment reads: "In this section, the report says that an Excess Carryover account includes a party's unproduced rights in the Safe Yield *"and Basin Water acquired from other parties."* What is intended by the words in italics? Should the italicized words be replaced with "and Excess Carryover acquired from other parties"?**

Response: It includes a party's unproduced safe yield rights and the unproduced rights acquired from other parties.

Comment No. 6. Storage Agreement section, **Overlying Non-ag Pool comment reads: "In this section, the report says that, in evaluating applications for storage agreements, Watermaster must conduct an investigation to determine if the water stored and recovered under a proposed storage agreement will cause MPI to a party or the basin. As stated above, the Judgment appears to authorize control and regulation by Watermaster of Supplemental Water, but not carryover water. Is there a basis in the Judgment for investigations of MPI for storage of excess carryover? What is the basis?**

Response: Paragraph 7 of Exhibit "G" (Overlying (Non-Agricultural) Pool Pooling Plan) and Paragraph 12 of Exhibit "H" (Appropriative Pool Pooling Plan) to the Restated Judgment both require a storage agreement with Watermaster as a condition of storing excess carryover.

Comment No. 7. Existing Managed Storage and Proposed Storage and Recovery Programs section. ***Overlying Non-ag comment reads: "In this section, the report introduces the term "managed storage" for the first time. Prior to this section, all storage was referred to as "storage." The implication is that "managed storage" is a subset of "storage." What is the difference between "storage" and "managed storage"?***

Response: Managed storage is the aggregate of Carryover, Excess Carryover, Local Storage, and Supplemental Waters. This term was used throughout the Storage Framework Investigation presentations and report.

Comment No. 8. Storage Management Plan Requirements section. ***Overlying Non-ag comment reads: "In this section, the report says that it is "logical" to consider establishing an aggregate limit for all storage at 700,000 af. As stated above, the Judgment appears to authorize control and regulation by Watermaster of Supplemental Water, but not carryover water. Should limits on storage apply to Supplemental Water and perhaps other water, but not apply to carryover water?"***

Response: The limits suggested in this section are intended to apply to all water held in managed storage, which includes carryover water.

Comment No. 9. Mitigation of Reduced Net Recharge and Safe Yield section***. Overlying Non-ag comment reads: "In this Section, the report says that Watermaster assesses a 0.07 percent loss to storage accounts based on estimated losses of water in the Basin to the Santa Ana River. As stated above, the Judgment appears to authorize control and regulation by Watermaster of Supplemental Water, but not carryover water. Should such losses be assessed on Supplemental Water and perhaps other water, but not on carryover water?***

Response: Watermaster assesses these losses on excess carryover and supplemental water in storage.

Comment No. 10. Mitigation of Reduced Net Recharge and Safe Yield section. ***Overlying Non-ag comment reads: "In this Section, the report says that the "Storage Framework Investigation" demonstrated that storing water has the effect of reducing net recharge and Safe Yield. Where on Watermaster's website can the Storage Framework Investigation currently be found? Where in the report is this effect "demonstrated." If storage has this effect, should such reduction be attributed to Supplemental Water and perhaps other water, but not to carryover water?***

Response. Please see the Storage Framework Investigation Report located here:
https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=1429

The effect of managed storage on net recharge was presented and discussed at several workshops that were conducted during the preparation of the Storage Framework Investigation and pdfs of the PowerPoint presentation from these workshops are located here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=1406

Comment No. 11. Mitigation of Reduced Net Recharge and Safe Yield section. ***Overlying Non-ag comment reads: "In this Section, the report says that reduction in net recharge caused by storage is an MPI. Carryover water is unproduced water, and unproduced water is a natural condition pre-dating existing development of the basin. How can a natural condition be an MPI?***

Response: In a truly natural condition, basin storage will be maximized and all recharge to the basin is lost to rising groundwater and evapotranspiration by riparian vegetation. In a truly natural condition, net recharge is zero. Increasing the volume of water in managed storage has the effect of suppressing net recharge regardless of how you label the water that is included in the managed storage. That said, the text has been changed substituting the term "adverse impact" for MPI.

City of Ontario

Comment No. 1. Page 10, second paragraph. ***The City's comment reads: "Paragraph 2 contemplates establishing an aggregate limit of 300kaf for all Storage & Recovery (S&R) programs, "provided that the aggregate storage limit for parties does not exceed" 700kaf. This is different from establishing an aggregate limit equal to the total space (1M af) less the volume used by parties (700kaf or less). In the case that parties use less than 700kaf, while S&R programs remain limited to 300kaf, how will the difference between the actual volume of stored water and 1M af be addressed?"***

Response: The suggested aggregate allocation of 700 kaf to the parties for their individual conjunctive-use activities and the 300 kaf for Storage and Recovery Programs is based on the results of the Storage Framework Investigation. The allocation of managed storage space for these two types of uses should be discussed and agreed upon by the parties for inclusion in the 2020 Storage Management Plan.

Comment No. 2. Page 11, "Limitation of Transfers or Leases of Water Rights and Water Held in Managed Storage section." ***The City's comment reads: " The second paragraph in this section states that the limit on certain transfers "should be reconsidered" under certain conditions. It seems logical that these conditions could also include mitigation such as may be required for S&R programs. In addition, S&R programs may be designed such that puts and takes aid in addressing land subsidence, plumes, etc."***

Response: This management requirement will be described in greater detail in the draft 2020 Storage Management Plan

Comment No. 3. Page 11, Mitigation of Reduced Net Recharge and Safe Yield section***. City's comment reads: "This section identifies "two fundamental approaches to mitigate the reduction in net recharge" caused by stored water. Are there additional approaches that can be explored? One such approach may be preemptive mitigation rather than allocation of effects."***

Response: The white paper refers to bookends on the approach to identify and mitigate a reduction in Safe Yield caused by the use of managed storage. The specific approach in allocating mitigation liability for storage induced changes in net recharge and Safe Yield should be discussed and addressed by the parties.

Comment No. 4. Page 12, Evaluation of Storage and Recovery Program Impacts, MPI, and Mitigation section. ***City's comment reads: "The second paragraph in this section states that "Watermaster will review each Storage and Recovery Program application, estimate the surface and groundwater system response...." (emphasis added) It is unclear why it is necessary for Watermaster to evaluate surface water system responses."***

Response: The use of existing recharge facilities for Storage and Recovery Programs may conflict with the use of the same facilities for stormwater recharge and may reduce net recharge. The intent to is characterize this conflict and to subsequently develop conditions on the Storage and Recovery Program to mitigate it.

Comment No. 5. ***The City's comment reads: "General: Please provide citations for all references to guidance documents, particularly when quotation marks are used. Example: Page 13, 1st paragraph under "Storage Management Plan Update."***

Response: This request will be incorporated into the final version of the White Paper.

Appendix B1

Comments and Responses on the draft 2020 Storage Management Plan Report, Version 1

Appendix B1 -- Comments and Responses on the Draft 2020 Storage Management Plan Report, Version 1

October 1, 2019 letter from the Overlying Agricultural Pool

Comment No. 1**.** Page 1, fourth paragraph. Ag pool comment reads: ***"In regard to use of storage space by the Parties and other entities, the Ag Pool proposes that a schedule be developed to dictate when, how and by whom storage will be used. The Ag Pool also proposes that different storage accounts be valued and used appropriately."***

Response. Please see Section 2.1 of the draft 2020 SMP, Version 2.

Comment No. 2. Page 1, fifth paragraph. Ag pool comment reads: ***"The Draft 2020 SMP introduces "three types of storage agreements that result in four types of storage accounts," but only describes three of those four types of storage accounts. (Draft 2020 SMP, Section 1.1.) It also does not explain which type(s) of accounts are available to which Parties or Pools. Although this information is available in other documents, adding this information to the SMP would make for a more complete description of the types and ownerships of current and potential future accounts and would make this section more consistent with Table 1-1."***

Response. In Table 1-1, the column heading in the Overlying Non-Agricultural accounts for "Local Storage" has been changed to "Excess Carryover."

Comment No. 3. Page 1, fifth paragraph. Ag pool comment reads: ***"This paragraph also states that the Watermaster tracks "losses" and reports its accounting in the annual assessment process. Would it be helpful to expand on the types of "losses" that Watermaster tracks? Are there losses other than storage losses?***

Response. The text has been revised to include a description of the losses referred to in Section 1.1.

Comment No. 4. Page 1, sixth paragraph. Ag pool comment reads: ***"The Draft 2020 SMP also states that Watermaster must conduct an investigation to determine if the water stored and recovered under the proposed storage agreement will cause "potential MPI," and that the Watermaster cannot approve a storage agreement that will "result in MPI." (Draft 2020 SMP, Section 1.1.) Is the difference in wording intentional? If so, it would be helpful to explain the***

difference in meaning/use and maybe add this clarification to Note 7 on page 1-1. "Potential MPI" is also used in the first paragraph of Section 2.3.3.2."

Response The text was updated and now reads:

> "In evaluating applications for storage agreements, Watermaster must conduct an investigation to determine if the water stored and recovered under a proposed storage agreement has the potential to cause MPI to a Party or the basin. If Watermaster determines that implementation of the proposed storage agreement has the potential to cause potential MPI, the applicant must revise its application and demonstrate that there will be no MPI, or Watermaster must impose conditions in the storage agreement to ensure there is no MPI. Watermaster cannot approve a storage agreement that has the potential to cause MPI. "

Comment No. 5. Page 2 first full paragraph. Ag pool comment reads: ***"The Draft 2020 SMP recommends that the Watermaster's current limitation on transfers or leases of water rights and water held in managed storage from Parties that are situated such that they pump groundwater outside of MZ1 to Parties that pump in MZ1 for the purpose of replenishment "should be reconsidered if the land subsidence management plan for MZ1 includes consideration for such transfers, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan." (Draft 2020 SMP, Section 2.3.1.) The Watermaster has indicated that "[t]he ongoing monitoring and analysis for land subsidence and the implementation of future land subsidence plans will provide the information necessary to update the requirement." (Comments and Responses on the June 8, 2019 Storage Management Plan White Paper, p. 10) However, the Draft 2020 SMP does not identify or discuss any parameters that will be used to determine whether the subsequent monitoring demonstrates the sufficiency of the land subsidence management plan. The Draft 2020 SMP also does not identify when such an evaluation would be made or if the limitation would be reinstated if conditions change in the future. Accordingly, the Draft 2020 SMP should be revised to include more detail on when and how the "sufficiency" of the plan will be determined."***

Response. Consider the timeline to reach a point where a land subsidence management plan for MZ1 has been functioning and monitoring and analysis can provide reliable information to assess the ability to allow transfers from Parties outside of MZ1 to Parties inside MZ1 that will not cause land subsidence. Given the present state of knowledge, it could take at least ten years to develop this plan and an agreement to implement it. It could take ten or more years of implementation and monitoring to assess the efficacy of the land subsidence management plan and additional investigations after that to determine if transfers from Parties outside of MZ1 to Parties inside MZ1 could be done without contributing to land subsidence. In sum, more than 20 years. Given this timeline, it is not appropriate to *"identify or discuss any parameters that will be used to determine whether the subsequent monitoring demonstrates the sufficiency of the land* *subsidence management plan."* Rather, the land subsidence management plan should include monitoring and analysis to demonstrate whether or not these transfers could occur and the conditions under which transfers could occur pursuant to the Peace Agreement. The land subsidence management plan should include monitoring and analysis that will provide information to determine if Storage and Recovery Programs can be operated in MZ1 without causing land subsidence.

Comment No. 6. Page 2 second paragraph. Ag pool comment reads***: "The Draft 2020 SMP identifies the two potential approaches to mitigate the reduction in net recharge caused by the Parties' storage management activities but does not further discuss the approaches. Regarding the second identified potential approach, the Ag Pool maintains that working through this issue will require consideration of factors that may/may not be known at the time a storage agreement is proposed or executed, versus uncertainties that could affect the availability, quantity, or cost of water under future continued storage or take conditions. For example, might a Party's interest in executing a storage agreement be affected if the debit associated with reduction in net recharge could not be quantified in advance?"***

Response. A proposed approach has been incorporated into the draft 2020 SMP, Version 2.

Comment No. 7. Page 2 third paragraph. Ag pool comment reads: ***"The Draft 2020 SMP states that storage "put" and "takes" should be prioritized to occur in MZ2 and MZ3 to avoid new land subsidence and interfering with land subsidence management in MZ1, to minimize pumping sustainability challenges, to minimize the impact of storage and recovery operations on solvent plumes, to preserve the state of Hydraulic Control, and to take advantage of the larger and more useful groundwater storage space in MZ2 and MZ3. Nonetheless, the Draft 2020 SMP again recommends that such prioritization "should be reconsidered if the land subsidence management plan for MZ1 includes consideration for such transfers, the land subsidence plan is implemented, and subsequent monitoring demonstrates the sufficiency of the land subsidence management plan" without further detail. (Draft 2020 SMP, Section 2.3.3.1.) The Draft 2020 SMP should be revised to include more detail on when and how the "sufficiency" of the plan will be determined."***

Response. See response to comment No. 5.

Comment No. 8. Page 2 fourth paragraph. Ag pool comment reads***: "Section 1.2, paragraph 1 identifies MWD's "Dry-Year Yield Program (DYYP)." The Ag Pool suggests adding a definition for MWD's DYYP that is more robust than the brief description contained in the paragraph under Table 1-1. Additionally, the paragraph indicates a maximum put of 25,000 afy and a maximum take of 33,000 afy under the DYYP. However, Table 1-1 shows the maximums were***

exceeded twice, in 2009 (40,383 take) and 2018 (35,065 put). An explanation of these apparent exceedances would be helpful."

Response. The text has been modified to explain the put exceeding 25,000 afy in fiscal year 2018 and the take exceeding 33,000 af in fiscal year 2009.

Comment No. 9. Page 2 fifth paragraph. Ag pool comment reads***: "Section 1.2, paragraph 4 refers to "managed storage space available." The Ag Pool suggests that Watermaster consider clarifying whether this is physical space available (without resulting in MPI), space available through existing approvals, both, or something else."***

Response. It's physical space available to the Parties and it was authorized in the 2010 Peace II Project Subsequent Environmental Impact Report and its 2017 Addendum. Other than the impact from the use of managed storage on net recharge and Safe Yield, no MPI is projected to occur.

Comment No. 10. Page 2 sixth paragraph. Ag pool comment reads: ***"The Draft 2020 SMP states that the "Watermaster will periodically review current and projected basin conditions, compare this information to the projected basin conditions prepared in the evaluation of the Storage and Recovery Program application process, compare the projected Storage and Recovery Program operations to actual Storage and Recovery Program operations, and make findings regarding the efficacy of related MPI mitigation measures and requirements in the Storage and Recovery Program storage agreement. And, based on its review and findings, Watermaster may require changes in the Storage and Recovery Program agreements to mitigate MPI." (Draft 2020 SMP, Section 2.3.3.2.) The Ag Pool proposes that Watermaster's review of Hydraulic Control be conducted on an annual basis and no less than every two years."***

Response. Presently Watermaster evaluates the state of hydraulic control on a one- to two-year frequency and reports the results of the evaluation to the Regional Board pursuant to its Maximum Benefit commitments.

Comment No. 11. Page 3 first full paragraph. Ag pool comment reads: ***"Sections 2.3.3.2 and 2.3.3.3 refer to Watermaster developing mitigation measures and incorporating such measures into a storage agreement. Is it appropriate that Watermaster develop the mitigation measures (given that doing so might affect the feasibility or cost of a Party's storage program) or should Watermaster simply identify the potential MPI that must be mitigated and leave it to the Party to develop and propose mitigation measures that Watermaster finds sufficient and acceptable?"***

Response. The text in Section 2.3.3.2 was modified to read:

> "Watermaster will review each Storage and Recovery Program application, estimate the surface and groundwater system response, prepare a report that describes the response and potential MPI, and develop mitigation requirements to mitigate MPI caused by the proposed Storage and Recovery Program. The Storage and Recovery Program applicant will develop mitigation measures pursuant to these requirements and incorporate them into their Storage and Recovery Program application. Upon approval by Watermaster, these mitigation measures will be incorporated into the Storage and Recovery Program storage agreement."

The text in Section 2.3.3.3 was modified to read:

> "Watermaster will, as part of the Storage and Recovery Program application review process, make a projection of the program's expected impact on the state of Hydraulic Control. Watermaster will review these impacts and develop mitigation requirements for the proposed Storage and Recovery Program. The Storage and Recovery Program applicant will develop mitigation measures pursuant to these requirements and incorporate them into their Storage and Recovery Program application. Upon approval by Watermaster, these mitigation measures will be incorporated into the Storage and Recovery Program storage agreement."

Comment No. 12. Page 3 second paragraph. Ag pool comment reads***: "The Draft 2020 SMP states that the Watermaster will "periodically" update the SMP and suggests "it can be completed efficiently with the recalculation of Safe Yield on a ten-year frequency." The Draft 2020 SMP also suggests that Watermaster should consider updating the SMP at least five years before the aggregate amount of managed storage by the Parties falls below 340,000 af if not done earlier in a periodic update of the SMP. The Ag Pool proposes that a projection of anticipated managed storage should be made at least every 5 years if the SMP is updated every 10 years. This will facilitate identification of an interim trigger to update the SMP based on managed storage falling below the 340,000 af threshold."***

Response. The text was modified to read:

> "Watermaster will periodically review and update the SMP based on: monitoring information obtained since the previous SMP was adopted, technology changes, and the "needs and requirements of the lands overlying the Chino Basin and the owners of the rights in the Safe Yield or Operating Safe Yield of the Basin." The periodic review and update of the SMP will require the use of updated planning and hydrologic data and models, and it should be completed: at no less than a five-year frequency; when the Safe Yield is recalculated; or when Watermaster determines a review and update is warranted based new information and/or the needs of the Parties or the Basin.

> The projected aggregate amount of water in managed storage by the Parties in 2056 (planning horizon of the 2018 SFI) is about 340,000 af. The impacts to the Basin and the Parties from reducing managed storage below 340,000 af has not been estimated. Notwithstanding the SMP update frequency stated above, Watermaster should update the SMP at least five years before the aggregate amount of managed storage by the Parties is projected to fall below 340,000 af."

Comment No. 13. Page 3 third paragraph. Ag pool comment reads: ***"The storage agreement application process section of the Draft 2020 SMP was left blank to be filled by Watermaster staff in the next draft. The Ag Pool proposes that the storage agreements include limits for the parties' use of managed storage. The storage agreements should also include a provision that places applicants on notice that water transfers between parties and its storage and extraction are subject to the continued finding of no MPI by Watermaster. The pumping sustainability issues should also be addressed in the storage agreements by including identification and analysis of production locations. The Draft 2020 SMP also did not address Ag Pool's proposed abandonment of the Watermaster rebuttable presumption of no MPI. Accordingly, Ag Pool restates its proposal to abandon the Watermaster's rebuttable presumption of no MPI."***

Response. Watermaster will present its proposed storage application process in the draft 2020 SMP Report, Version 3 in November.

October 1, 2019 annotated version of the draft 2020 SMP, Version 1 provided by the Inland Empire Utilities Agency

Comment No. 1. Comment refers to Section 2.2 referenced immediately above. IEUA comment reads: ***"Will there be a prioritization of Basins and resulting operation scheme?"***

Response. There is an existing hierarchal scheme for the use of spreading basins that includes the following: (1) flood control, (2) maximizing storm water recharge, (3) Watermaster replenishment and recharge, (4) IEUA recycled water recharge, and (5) maintenance. Use of spreading basins by Storage and Recovery Programs would come after the five higher priority uses have been satisfied.

Comment No. 2. Comment refers to Section 2.3.2 on page 2-2: "Two potential approaches were identified in the 2019 SFI and 2020 SMP White Paper to mitigate the reduction in net recharge caused by the Parties storage management activities." IEUA comment reads: ***"Should this include S&R programs or is it implicit?"***

Response. Section 2.3.2 refers to mitigation of the reduction in net recharge and Safe Yield due to the use of managed storage by the Parties. Mitigation for the reduction of net recharge and Safe Yield due to the use of managed storage by a Storage and Recovery Program is explicitly described in Section 2.3.3.2 of the draft 2020 SMP Report, Version 2.

Comment No. 3. Comment refers to Section 2.3.4 on page 2-3 and refers to a future section of the 2020 SMP that is not yet written. IEUA comment reads: ***"A flow chart may be helpful for this section once it is prepared?"***

Response. A flow chart may be included in the draft 2020 SMP, Version 3.

Comment No. 4. Comment refers to Section 2.3.4 on page 2-3 and refers to a future section of the 2020 SMP that is not yet written. IEUA comment reads: ***So are the S&R Programs going to be analyzed with boundary conditions of managed storage between 720kaf and 340kaf? Or based on annual projections as provided herein?"***

Response. No. Storage and Recovery Programs will be evaluated for their use of storage space in excess of that used by the Parties. Presently, the managed storage use by the Parties is projected to reach a maximum value of 720,000.

Appendix B2

Comments and Responses on the draft 2020 Storage Management Plan Report, Version 2

Appendix B2 – Comments and Responses on the October 24, Draft 2019 Storage Management Plan Report, Version 2

November 19, 2019 comment letter from the Overlying Agricultural Pool (OAP)

Comment No. 1**.** Section 1.1. OAP comment reads: ***"The introduction and descriptions of storage agreements and accounts remain unclear. The text refers to three types of agreements and four types of accounts. The text names four types of accounts, but only describes three. The relationship between types of accounts and their corresponding agreements should be clarified."***

Response. The text of SMP document was revised and it now reads:

> "Since the Judgment came into effect, Watermaster developed rules and regulations, standard storage agreements, and related forms. <u>There are three types of storage agreements that result in five types of storage accounts: Excess Carryover, Local Supplemental-Recycled, Local Supplemental-Imported, Pre-2000 Quantified Supplemental, and Storage and Recovery.</u> An Excess Carryover account includes a Party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool Parties and Operating Safe Yield for Appropriative Pool Parties) and Basin Water acquired from other Parties. Local Supplemental Water accounts includes imported and recycled water that is recharged by a Party and similar water acquired from other Parties. A Storage and Recovery account includes Supplemental Water and is intended to produce a "broad and mutual benefit to the Parties to the Judgment." Watermaster tracks the puts, takes, losses, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process. <u>The losses assessed by Watermaster are based on the amount of water in managed storage (excluding Carryover) and they offset the increase in groundwater discharge to the Santa Ana River from the Chino Basin attributable to managed storage (excluding Carryover). Watermaster also assesses losses due to evaporation on the puts when water is recharged in spreading basins</u>." (emphasis added)

Comment No. 2**.** Section 1.1. OAP comment reads: ***"The response to OAP Comment No.3 indicates the "text has been revised to include a description of the losses referred to in Section 1.1." (Appendix B Response to Comments on 2020 SMP V1, p. B-1.) The noted revisions and description are not apparent. Where in the text can they be found? There is a storage loss factor***

for flow out of the Chino North Management Zone (described in the White Paper). Are other losses calculated and tracked?"

Response. See text revision in the response to Comment No. 1 above.

Comment No. 3**.** Section 1.1. OAP comment reads: ***Details, such as the date it was approved by the court and its purpose, are provided for Form 8, however, corresponding information about Form 1 is not provided. Consider adding such information or explaining why the information is not relevant for Form 1."***

Response. The text of SMP document was revised to include the following paragraph in Section 1.1:

> "The Form 1 Application for Local Storage Agreement was approved in 2001 and has not been amended since that time; it is the mechanism through which Parties may apply to enter into a Local Storage Agreement."

Comment No. 4. Section 2.1. OAP comment reads: ***"This section does not describe how storage may be allocated among the Parties. Watermaster counsel has indicated Watermaster has no priority for allocation of storage but what will happen if it becomes a limited resource? Is it first come first serve until fully allocated with the hope that it will not be fully allocated?"***

Response. Watermaster anticipates, based on the Parties' projections, that 800,000 AF would be adequate to satisfy the Parties' storage activities and the DYYP until 2030. Watermaster plans to evaluate projections periodically and update the SMP no less frequently than every 5 years having the opportunity to adjust and avoid limiting the Parties use.

Comment No. 5. Section 2.1. OAP comment reads: ***"It is clear that a storing entity must prepare an evaluation of managed storage above 1,000,000 acre-feet (af) "to ensure that there will be no material injury." The OAP suggests making it clear (as we understand from the workshops) that the evaluation will be both a technical evaluation in addition to CEQA compliance. The OAP suggests including clarification that the evaluation needs to address potential Material Physical Injury (MPI) as well as adverse impacts (Safe Yield reduction and loss of hydraulic control)."***

Response: The text of SMP document was revised and it now reads:

> "Note that the use of managed storage greater than 1,000,000 af may be possible provided the storing entity submits a bona fide Storage and Recovery Program application, demonstrates that the program has broad mutual benefit,

> demonstrates that program's mitigation measures will meet the mitigation requirements of the Watermaster to ensure there will be no MPI and other adverse impacts, complies with CEQA and obtains approval from the Watermaster." (emphasis added)

Comment No. 6. Section 2.3.2. *OAP comment reads:* ***"Future evaluations of storage impacts to Safe Yield will be done in the Safe Yield reset or interim corrections. It may be helpful in this section to reference the 2015 Reset Technical Memorandum and the April 2017 Court order for additional information on the Safe Yield reset methodology."***

Response. A footnote was added to this section that reads:

> "Refer to the 2015 Reset Technical Memorandum and the April 2017 Court Order for additional information on the Safe Yield reset methodology. These documents can be found here: https://cbwm.syncedtool.com/shares/folder/e83081106c3072/?folder_id=1595."

Comment No. 7. Section 2.4.2. OAP comment reads: ***"The Draft SMP Version 2 states, "…recharge loss rate… may be adjusted from time-to time…" What is the mechanism for developing and approving this adjustment, and can it only be done under the condition of additional evaluation of Safe Yield?"***

Response. Watermaster may adopt uniform rules to address triggers, notice, opportunity to respond and to implement corrective actions. Moreover, as part of the Storage and Recovery application and approval process, each Storage and Recovery application may have customized conditions responsive to the characteristics of the specific project.

Comment No. 8. Section 2.4.2. OAP comment reads: ***"The Draft SMP Version 2 states, "Watermaster will periodically review current and projected basin conditions…" Periodically is subject to interpretation. Will this review be done at a minimum frequency, based on threshold changes in amounts of water in storage, or combined with other reviews (e.g., SMP updates, additional Safe Yield evaluations"***

Response. Watermaster will periodically review current and projected basin conditions when it updates the SMP as described in Section 2.6. Watermaster could conduct additional reviews if routine assessments of monitoring and planning data indicate changed conditions from that which was assumed in the evaluation of existing Storage and Recovery Program, when the Safe Yield is recalculated and when new Storage and Recovery Program applications are submitted to Watermaster.

Comment No. 9. Section 2.4.3. OAP comment reads: ***"The Draft SMP Version 2 states, "Watermaster will periodically review current and projected state of Hydraulic Control…" Periodically is subject to interpretation. Will this review be done at a minimum frequency, based on threshold changes in amounts of water in storage, or combined with other reviews (e.g., SMP updates, additional Safe Yield evaluations)?"***

Response. Hydraulic Control is evaluated annually in the Max Benefit Report to the Regional Board.

Comment No. 10. Section 2.4.3. OAP comment reads: ***"Please clarify that loss of Hydraulic Control is not an MPI, if that is what is intended. Loss of Hydraulic Control appears to have a higher threshold of impact than impacts to Safe Yield in the SMP because loss of Hydraulic Control "must be mitigated" as indicated in the section heading. The OAP suggests additional discussion of this need for a higher level of mitigation in the text of this section."***

Response. The text of SMP document was revised in multiple locations to state that loss of Hydraulic Control is an adverse impact and not MPI.

Comment No. 11. Section 2.6. OAP comment reads: ***"This section identifies the need for Watermaster to "update the SMP at least five years before the aggregate amount of managed storage by the Parties is projected to fall below 340,000 af." Watermaster has indicated in its response to comments that this threshold of 340,000 af includes Storage and Recovery programs. The 340,000 af threshold was established because impacts to the basin (e.g. subsidence induced by groundwater withdrawal) due to reducing managed storage below this threshold have not been evaluated. It could be termed "the band of storage management untested for MPI." We suggest that it may be appropriate to discuss this issue in Section 2.4.2 because there is additional risk in any storage and recovery program that relies on this untested band of storage management."***

Response. The 340,000 af threshold includes managed storage by the Parties and does not include Storage and Recovery programs.

November 21, 2019 comment email from the Overlying Non- Agricultural Pool (ONAP)

Comment No. 1. Page 1-2 – Last sentence of Background section. ONAP comment reads: ***"This sentence omits that Non-Agricultural Pool Parties can have Supplemental Waters. Please make the correction."***

Response: The text of SMP document was revised and it now reads:

> "Local Storage includes Excess Carryover for the Overlying Non-Agricultural Pool Parties and Excess Carryover and Supplemental Waters for the Appropriative Pool and Overlying Non-Agricultural Pool Parties."

Comment No. 2. Page 1-4 and Page 2-1 – Conjunctive-Use. ONAP comment reads: ***"Section 1.2 and Section 2.1 talk about conjunctive-use. How is conjunctive-use defined? What is included and excluded?"***

Response: First sentence of Section 1.2 describes conjunctive use.

Comment No. 3. Page 2-3 & 2-4 – Local Storage Applications/Agreements. ONAP comment reads: ***"Section 2.5 addresses the evergreen concept and the need for a revised Form 8. Will a new Form 1 also be needed? Will input from the Pools be considered in crafting revised forms?"***

Response: Proposed revised Forms, to the extent desired, will be considered and approved through the Pool Committee, Advisory Committee, and Board process.

Comment No. 4. Section 2.5. ONAP comment reads: **"Section 2.5 also comments that the evergreen agreements would be valid for the duration of the Peace Agreement. What happens upon expiration and how much advance notice will Parties have?"**

Response: The expiration of the Peace Agreement will be known at least five years in advance. Accordingly, the effect of the expiration of the Peace Agreement and storage agreements can be considered and addressed at the time an intervening SMP update is undertaken.

Comment No. 5. Page 2-4 – MPI. ONAP comment reads: ***"The last sentence in Section 2.5 discusses MPI. Please provide a summary of what MPI may be caused by water in storage if***

the Parties do not exceed the proposed First Managed Storage Band of 800,000 AF. What MPI could be caused over 800,000 AF?"

Response: The Storage Framework Investigation indicated there is no MPI within the FMSB; storage used above 800,000 AF will need to be evaluated for MPI (land subsidence, water quality, and pumping sustainability) and other adverse effects (e.g. reduction in Safe Yield, loss of Hydraulic Control).

November 19, 2019 comment letter from the City of Chino

Comment No. 1. Section 1.2 (Page 1-5 2nd paragraph) and Section 2.1 (page 2-1 paragraphs 1 and 2). City's comment reads: ***"Section 1.2 indicates the combined use of managed storage and the existing Dry Year Yield (DYY) conjunctive use program is projected to reach a maximum of ~790,000 AF, assuming there is 100,000 AF in the DYY in 2028. Section 2.1 paragraph 1 indicates the First Managed Storage Band (FMSB, upper threshold = 800,000 AF) includes the DYY. Section 2.1 paragraph 2 indicates that extension of the DYY (beyond 2028) will require the DYY to use storage space above the 800,000 AF band threshold.*** (a) ***Does this mean that if the DYY is extended (beyond 2028) that the 100,000 AF of space below the 800,000 AF threshold (within FMSB) previously reserved for DYY use prior to 2028 is immediately available for managed storage use in 2029 and no longer available for the DYY?*** (b) ***Does this mean that any extension of the DYY program beyond 2028 would likely be required to mitigate impacts in-advance?*** (c) ***Do the terms of the existing DYY agreement require that the water in the DYY account be entirely depleted (withdrawn) prior to 2028 agreement expiration?"***

Response. (a) – Yes. (b) – Any Storage and Recovery Program would be approved only if any projected MPI and adverse impacts are addressed such that the Program could be undertaken without MPI or adverse impacts. (c) – The storage agreement does not address this issue; the Operating Committee is currently reviewing. The SMP is planned to be updated at a frequency no less than every 5 years so any changes regarding the DYYP agreement could be addressed in later updates if necessary.

Comment No. 2. City's comment reads: ***"Expanding on Comment No. 1 (above), the possibility of adjusting the FMSB upper threshold up or down, based on the Parties' needs, was discussed at the November 6th SMP Workshop #3. Please expand on the timing of the modifications to the FMSB and what the process would be to make changes to the FM SB. For example, would changes to the FMSB upper threshold require consent from all three Pools and would unanimous consent be required from the Appropriative and Overlying Non-Agricultural Pool members?"***

Response. The Restated Judgment gives Watermaster control over storage; Watermaster plans to update the SMP as described in Section 2.6 and at that time will seek input including water demand and supply projections from the Parties. The FMSB was defined based on the Parties' input, which would be considered again at the time of any SMP update.

Comment No. 3. Section 2.3.2. City's comment reads: ***"Section 2.3.2 indicates that reduction in Safe Yield (SY) due to projected managed storage volume is incorporated into the SY estimate, and that this adverse impact (i.e. reduced Safe Yield) is mitigated by the prospective calculation***

of SY. (a) ***Please provide a tabulation or other form of explanation that illustrates the impact/mitigation below the FMBS threshold of 800,000 AF. Presumably, other factors (besides managed storage) may also have the effect of reducing Safe Yield.*** (b) ***Can it be determined what portion of estimated SY reduction is due to storage management and what portion of estimated SY reduction is due to other factors?*** (c) ***If yes, then how can these factors (i.e. managed storage and other cultural condition factors) be described in separate quantitative terms to allow for a practical means to reconcile the associated impacts on an annual basis?***

For example, if SY (net recharge) is reduced as a result of increasing storage volumes (assuming no corresponding implementation of a plan for optimizing production that would be necessary to maintain SY), can this cause & effect be expressed algebraically? (d) ***If yes, then what is the algebraic formula? If no, then what practical method(s) may be used to quantify the cause & effect on an annual basis as storage volumes fluctuate?"***

Response. (a) – This information has not been developed by Watermaster or its consultants. (b) – Theoretically, yes. (c) – Technical work could be done to develop methods to allocate the projected changes in net recharge and Safe Yield based on changes in cultural conditions and the individual Parties pumping, recharge and the storage activities. (d) – This would be determined in the work described in (c). This scope of work is highly impractical as there are many variables to consider and thus has not been considered or budgeted.

Comment No. 4. City's comment reads: ***"Expanding on Comment No. 3 (above), Storage Framework Investigation (SFI) Figure 5-7 depicts a projected inflection point at approximately Year 2040 when the net recharge begins to steadily increase. SFI Figure 6-3 describes managed storage volumes in Year 2040 to be well above 500,000 AF (depending on assumed operating scenario), and then dropping to approximately 340,000 AF in the Year 2056. Please provide an explanation of the circumstances depicted by these two figures, and how/why Safe Yield (net recharge) is projected to increase in the future when there is a significant amount of managed storage."***

Response. As to Figure 5-7, the following observations can be made from the review of 2018 SFI report Tables 3-4 and 3-5. In Scenario 1A, total groundwater pumping is projected to increase from about 146,000 afy in 2018 to about 154,000 afy in 2030 (~ 8,000 afy increase) and thereafter gradually increase to about 177,000 afy by 2040 (~23,000 afy increase). Projected pumping is less than pumping rights through 2030 and storage is projected to increase through 2030. After 2030, pumping exceeds pumping rights and storage is projected to decrease. The net recharge projection generally declines with increasing storage and increases with decreasing storage. There is a time lag between the onset of the decrease in storage and increase in net recharge that is attributable to the basin dynamics – in 2032 the rate of decline in net recharge declines and by about 2040 the net recharge starts to increase. Inspection of the water budget shown in Table 3-5 indicates that the total recharge during the 2018 through 2050 period is fairly consistent and averages about 200,000 afy; and that the total discharge increases gradually over the same period from about 190,000 afy to 218,000 afy tracking the projected pumping. Cultural conditions have some effect in that the deep infiltration of precipitation and applied water decreased by about 5,000 afy from 2018 to 2050 and however this effect has been offset by a projected increase in storm water recharge in 2021.

As to Figure 6-3 the projected decline in managed storage occurs because 80 percent of the projected replenishment obligation, estimated to be about 17,000 afy after 2030, is satisfied from managed storage.

Comment No. 5. . Sections 2.4.2 and 2.4.3. City's comment reads: ***"Both discussions end with an indication that Watermaster may require changes in Storage and Recovery (S/R) agreements to mitigate impacts*. *What processes of Watermaster notification and S/R Party response are contemplated to allow S/R Parties to modify their behavior to avoid or minimize further mitigation after they have presumably already provided mitigation at the time their S/R agreements were initially approved?"***

Response. Watermaster may adopt uniform rules to address triggers, notice, opportunity to respond and to implement corrective actions. Moreover, as part of the Storage and Recovery application and approval process, each Storage and Recovery application may have customized conditions responsive to the characteristics of the specific project.

Comment No. 6. White Paper. City's comment reads: ***"The SFI (page 1-5) indicates the Chino Basin Groundwater Model and Recalculation of Safe Yield Pursuant to the Peace Agreement {Safe Yield report) assessed the hydrology of the Chino Basin, and concluded that managed storage was projected to increase from 487,000 AF in Year 2016 to approximately 663,000 AF by Year 2030 and then decline thereafter to zero (0.0) AF by Year 2051. This was restated in the White Paper at the bottom of page 5. However, as described in Comment No. 4 (above), the subsequent SFI analysis (Figure 6-3) indicates managed storage is projected to be approximately 340,000 AF in Year 2056.*** (a) ***Does the SFI analysis update/replace the conclusion of the Safe Yield report with respect to the projected volume of managed storage in future years? Please explain."***

"The White Paper (page 3) indicates the Operational Storage Requirement (OSR) is the volume of storage necessary to maintain the Safe Yield (SY), and that during the development of the Optimum Basin Management Program (OBMP ~ Year 2000) the OSR was estimated to be 5.3 MAF. The White Paper also indicates the Safe Storage Capacity {SSC} in addition to the OSR was estimated (~ Year 2000) to be 500,000 AF (the SSC is the amount of storage for which it was believed significant water quality impacts would not be triggered by groundwater level). More recent Storage Framework Investigation (SFI) analyses seem to indicate that the SSC is~ 800,000 AF. SMP Section 2.6 indicates it is projected that the aggregate amount of managed storage by the Parties is approximately 340,000 AF in Year 2056 and that impacts resulting from an aggregate managed storage volume less than 340,000 AF has not been estimated.

However, recent SMP workshop discussions seem to suggest that if the aggregate managed storage volume is less than 340,000 AF, then it is believed that new land subsidence may result. (b) ***What relationships exist between the originally estimated 5.3 MAF OSR, the originally estimated 500,000 AF SSC, the 800,000 AF SFI FMSB, and the projected 340,000 AF managed storage volume?"***

Response. (a) – Yes. The 2018 SFI uses updated water demand and supply projections. (b) – The estimated 5,300,000 af OSR and 500,000 af SSC described in the Peace Agreement IP have no relationship to 800,000 af FMSB described in the 2020 SMP. The storage management plan in the 2020 SMP is a completely different management paradigm than that described in the Peace Agreement IP. The 2018 SFI and 2020 SMP are based on 20 years of monitoring, a significantly updated hydrogeologic understanding of the basin and improved modeling.

Comment No. 7. Section 2.3.2. City's comment reads: ***"Comment No. 3 (above), pertaining to Section 2.3.2, describes a circumstance that might generally be regarded as an adverse impact since SY is reduced. Maintenance of the 340,000 AF threshold described in Comment No. 6 (above) would seem to represent a positive impact i.e. prevents triggering the "onset of new land subsidence" that would likely occur when managed storage falls below that critical managed storage volume. If true, then how might this positive impact be quantified?"***

Response. Quantification of a benefit on preventing the occurrence of new land subsidence by maintaining managed storage in excess of 340,000 af is beyond the scope of the 2018 SFI.

November 19, 2019 comment letter from the City of Ontario

1. **Storage Bands**

   a. ***Section 1.2 describes end conditions for the volume of water in the DYYP account in 2028 and the subsequent extraction. This paragraph (the second paragraph on page 1-5) does not accurately characterize the agreement between Metropolitan Water District and the Parties to the DYYP. Parties are not obligated to perform (i.e. remove water from the DYYP storage account) after 2028.***

   Response. The DYYP agreement does not address this issue; the Operating Committee is currently reviewing. The SMP is planned to be updated at a frequency no less than every 5 years so any changes regarding the DYYP agreement could be addressed at later updates if necessary.

   b. ***Section 2.1 states that "the managed storage space between 800,000 and 1,000,000 af is reserved for Storage and Recovery Programs" (emphasis added).***

      i. ***If, due to changing conditions or water resource management, Parties desire to store more than 800,000 af, will Watermaster authorize storage agreements for Parties to do so?***

      Response. Yes, but this will require future technical evaluations and an SMP revision that would occur in periodic update of the SMP as described in Section 2.6.

      ii. ***Does this statement indicate that Watermaster intends to reserve space above 800,000 af for Storage and Recovery Programs which may never come to fruition?***

      Response. No, Watermaster anticipates, based on Parties' projections, that 800,000 AF would be adequate to satisfy Parties' storage activities and the DYYP until 2030. Watermaster plans to evaluate projections periodically and update the SMP no less frequently than every 5 years having the opportunity to adjust and avoid limiting the Parties use.

   c. ***Section 2.1 states that "renewal or extension of the DYYP agreement will require the DYYP to use storage space above 800,000 af." It is unclear why this is required.***

   Response. The FMSB for the 2020 SMP includes the projected managed storage requirement of the Parties and the DYYP. The DYYP is included in the FMSB because it is an existing Storage and Recovery Program, it places contractual requirements on the Parties and it will terminate in 2028. Renewal or extension of the DYYP will trigger a new Storage and Recovery Program application process and the terms of the renewed or extended DYYP storage agreement will need to be consistent with the SMP at the time the new Storage and Recovery Program application is considered by Watermaster. Storage and Recovery Programs utilize storage above the FMSB. The 800,000 afy contained in the FMSB will be revised no later than 2025 and it may be increased or decreased based on the managed storage requirements of the Parties.

d. ***In the last paragraph of Section 2.1, it is noted that "the use of managed storage greater than 1,000,000 af may be possible provided the storing entity…demonstrates that the program has broad mutual benefit."***

i. ***What is the basis for this requirement? The Peace Agreement does not require all Storage and Recovery Programs provide broad mutual benefit. Broad mutual benefit is only necessary if Watermaster acts to condition, curtail or prohibit Local Storage to provide priority to Storage and Recovery Program(s).***

Response. Section 5.2(c)(iv)(b) of the Peace Agreement provides that Watermaster shall prioritize its efforts to regulate and condition the storage and recovery of water developed in a Storage and Recovery Program for the mutual benefit of the Parties to the Judgment and give first priority to Storage and Recovery Programs that provide broad mutual benefits.

ii. ***How is broad mutual benefit demonstrated and/or determined?***

Response. Broad mutual benefit will be determined at the time that application(s) for Storage and Recovery Program storage agreements are received, and it may be determined through Activity B as it is being contemplated in the 2020 OBMP Update.

2. Use of Spreading Basins

a. ***In Appendix B, Watermaster's response to Inland Empire Utilities Agency's (IEUA) Comment No. 1 states that "there is an existing hierarchal scheme for the use of spreading basins." The listed "hierarchal scheme" includes first flood control, second stormwater recharge, third Watermaster replenishment and recharge, and fourth IEUA recycled water recharge. Who developed the hierarchal scheme for the use of spreading basins and where is this scheme documented? To which basins does it apply? Basins may be owned by San Bernardino County Flood Control District, Chino Basin Water Conservation District, or IEUA.***

Response. The priorities are established in Section III of the "Agreement for Operation and Maintenance of Facilities to Implement the Chino Basin Recharge Master Plan". They are also specified by basin in the Operations Manual.

b. Additionally, basins and basin improvements in some cases were funded 50% by IEUA to increase recycled water recharge. How does the stated hierarchal scheme recognize the priority of the Parties that have invested financially in the basins?

Response. See response to comment 2.a. above.

3. Mitigation

a. What is the benchmark for mitigation impacts to net recharge and Safe Yield? In other words, is the demonstrated reduction compared against 140,000 afy, 135,000 afy, or another value, such as a theoretical Safe Yield absent stored water?

Response. The benchmark is estimated net recharge and Safe Yield absent stored water.

b. The Storage Framework Investigation concluded that the reduction in Safe Yield (as a percentage of average annual storage space used) ranged from 1.50% to 2.41% for bands 2, 3 and 4. The Storage Management Plan states this value as 2.0 percent. Please clarify if the 2.0 percent is an average across the three bands or if Watermaster is using a different methodology to set the 2.0 percent impact.

Response. It is an average. For clarity the text of SMP document was revised and it now reads:

> "The 2018 SFI concluded the that the net recharge and Safe Yield of the basin would be reduced annually by about 2.0 percent (ranged from 1.5 to 2.4 percent) of the volume of water stored in a Storage and Recovery Program." (emphasis added)

c. Section 2.4.1 suggests prioritizing puts and takes in MZ2 and MZ3, in part due to impacts on "solvent plumes." Solvent plumes are also present in MZ2 and could be impacted by puts and takes in that zone, as could pumping depressions. Each Storage and Recovery

Program should be individually analyzed to determine acceptable put and take locations.

Response. Comment noted.

d. ***For the process described in the second paragraph of Section 2.4.2, please describe if Watermaster will estimate lifetime reduction in net recharge at the onset of a Storage and Recovery Program, to be deducted annually similar to Local Storage losses, or if another method is envisioned.***

   Response. Watermaster will prepare an initial estimate of "rate" of reduction in net recharge and Safe Yield attributable to a specific Storage and Recovery Program during the application process. Watermaster may update the rate periodically as described in the fourth paragraph of Section 2.4.2 (SMP version 2) and through periodic updates of the SMP as described in Section 2.6.

4. Scope and Timing of Environmental Review

The Appropriative Pool formally requested that Watermaster proceed with the environmental review of storage management, including working with the Appropriative Pool's technical consultant. Watermaster has indicated that it intends to incorporate the Storage Management Plan into the current Optimum Basin Management Plan (OBMP) update effort, and then pursue environmental review on the package. However, the OBMP update effort is not subject to the same demonstrated time sensitivities as the Storage Management Plan, and negotiations have not yet begun on the activities to be included in an implementation plan. Ontario requests that Watermaster, responsive to the Pool's request, perform environmental review of the Storage Management Plan independent of and ahead of any environmental review that may be needed for the OBMP update.

Response. Comment noted.

5. Frequency of Updates

What is the basis for setting the minimum frequency at every five years? Performing the update every ten years concurrently with Safe Yield recalculations will provide a timelier and more comprehensive picture of storage projections. The five-year requirement is excessive and presents an unnecessary cost to the paying stakeholders. If conditions change or if the need arises, additional updates can be performed. Ontario recommends a minimum frequency of every ten years for updates.

Response. Comment noted.

6. Characterization of Material Physical Injury

a. In Footnote 7 defining Material Physical Injury, storage and recovery is incorrectly listed as "Storage, and Recovery." In the definition in Peace I, the term "storage and recovery" is not capitalized (in other words, is not a defined term) and is not separated into two actions by the placement of the comma.

Response. The text of SMP document was revised and it now reads:

> "Material Physical Injury" means material injury that is attributable to the Recharge, Transfer, <u>storage and recovery,</u> management, movement or Production of water, or implementation of the OBMP, including, but not limited to, degradation of water quality, liquefaction, land subsidence, increases in pump lift (lower water levels), and adverse impacts associated with rising Groundwater." (emphasis added)

b. Section 1.2 states that "for the planned use of managed storage by the Parties up to 700,000 af…there would be no MPI with the exception of a reduction of net recharge and Safe Yield…." A reduction of net recharge and Safe Yield is not included in the definition of Material Physical Injury.

Response. The SMP document has been revised to characterize the reduction in net recharge and Safe Yield attributable to managed storage activities as an adverse impact. The text now reads:

> "The 2018 SFI projected that for the planned use of managed storage by the Parties up to 700,000 af that Hydraulic Control would be <u>maintained, that there would be no MPI and that there would be an adverse impact from the</u> reduction of net recharge and Safe Yield attributable to the use of managed storage." (emphasis added)

c. Section 2.4.2 includes "reduction in Safe Yield" in the list of "MPIs to be addressed" in the first paragraph. A reduction in Safe Yield is not included in the definition of Material Physical Injury.

Response. The SMP document has been revised to characterize the reduction in net recharge and Safe Yield attributable to managed storage activities as an adverse impact.

7. ***Types of Storage Accounts Storage Agreements***

   a. ***Section 1.1 lists "four types of storage accounts" under "three types of storage agreements." It is unclear what the three types of storage agreements are, and the four types of storage accounts include "Local Storage" separate from "Local Supplemental" and "Excess Carryover." By definition, Local Storage includes Excess Carryover and Local Supplemental. Please clarify this statement.***

   Response. The text of the SMP document was revised and now reads:

   > "Since the Judgment came into effect, Watermaster developed rules and regulations, standard storage agreements, and related forms. There are three types of storage agreements that result in five types of storage accounts: Excess Carryover, Local Supplemental-Recycled, Local Supplemental-Imported, Pre-2000 Quantified Supplemental, and Storage and Recovery. An Excess Carryover account includes a Party's unproduced rights in the Safe Yield (Safe Yield for Overlying Non-Agricultural Pool Parties and Operating Safe Yield for Appropriative Pool Parties) and Basin Water acquired from other Parties. Local Supplemental Water accounts includes imported and recycled water that is recharged by a Party and similar water acquired from other Parties. A Storage and Recovery account includes Supplemental Water and is intended to produce a "broad and mutual benefit to the Parties to the Judgment. Watermaster tracks the puts, takes, losses, and end of year storage totals for all of these storage accounts, and reports on this accounting in the annual assessment process." (emphasis added)

   b. ***Please include a citation for the quotation at the top of page 1-3.***

   Response. The SMP document was revised to include the citation. The citation reads: "See paragraph 5.2(c)(iv)(b) of the Peace Agreement"

November 22, 2019 comment letter from the City of Upland

Comment No. 1. Section 1.2, Page 1-4. City's comment reads: " **Reduction of net recharge appears to be characterized herein as Material Physical Injury (MPI).** (a) **However, in Section 2.3.2 and at the November 6, 2019 2020 SMP workshop, reduction of net recharge is characterized as an adverse impact and mitigated for within the Safe Yield recalculation.** (b) **With the typical duration between Safe Yield recalculations being approximately 10-years, why isn't the mitigation for reduction of net recharge calculated annually to respond to the annual fluctuations in storage volume (as proposed in Section 2.4.2 for Storage and Recovery Programs)?** (c) **What are the advantages and disadvantages for mitigating for reduction in net recharge being embedded in Safe Yield versus on an annual basis?"**

Response. (a) – The text in the SMP has been modified to describe reductions in net recharge and Safe Yield as an adverse impact. (b) The Court's April 2017 order establishes the SY recalculation methodology; the recalculation considers the volume of wet water in Storage over the coming decade. (c) See part (b).

Comment No. 2. Section 1.2, Page 1-5. City's comment reads: " **Generally, what is the technical basis for allowing the Dry Year Yield Program (DYYP) to exceed puts and takes? What was the technical basis for allowing the DYYP takes to exceed 40,000 acre-feet (AF) in 2009? Is that approved by Watermaster as an administrative procedure or is that circulated through the Pools and board for approval?"**

Response. When MWD wants to exceed the 25,000 AF of annual put set forth in the DYYP agreement, the Parties consider the request through the regular Watermaster process.

Comment No. 3. Section 2.1, Page 2-1. City's comment reads: " **Regarding storage greater than 1,000,000 AF, consider revising and elaborating on that process. More specifically, what constitutes a "bona fide" application. In addition, please consider adding the required CEQA analysis to store above 1,000,000 AF."**

Response. The text in the SMP document was revised to include a footnote containing a definition of a bona fide Storage and Recovery Program application. The footnote reads:

> "A bona fide Storage and Recovery Program application includes the name of the person; the source, quantity and quality of the Supplemental Water; a description of the facilities proposed to be used, operating plan and duration of the proposed Storage and Recovery Program; CEQA documentation; and any other information Watermaster requires to evaluate the application."

The SMP text was also revised to include a requirement to complete a CEQA process for Storage and Recovery Program application that wish to use managed storage space in excess of 1,000,000 af.

Comment No. 4. Section 2.2, Page 2-1. City's comment reads: **" The City's "Upland Basin" is used by Watermaster and IEUA pursuant to an agreement between the three agencies. The agreement stipulates a specific quantity of storage space allocated to Watermaster and IEUA. To date, the agencies have worked cooperatively under said agreement to optimize basin usage, including storage above the dead storage quantity and allowing others to use the City's basin for recharge. The priority of additional recharge above the 200,000 AF in the agreement is subject to negotiation. This section needs to be clarified to recognize that use of some spreading basins is subject to separate agreement(s)."**

Response. The text of the SMP document was revised and it now reads:

> "Watermaster will include provisions in storage agreements to prioritize the use of spreading basins to satisfy Watermaster's recharge and replenishment obligations over the use of spreading basins for other uses <u>subject to limitations provided in existing agreements with the owners of the facilities</u>." (emphasis added)

Comment No. 5. Section 2.3.1, Pages 2-1 and 2-2 . City's comment reads: **" The limitations placed on agencies within MZ1 due to the potential to cause MPI will likely be in effect for "more than 20-years" according to Watermaster (Appendix B, Comment No. 5, Page B-2) appear to pose a long-term constraint on the ability of agencies within MZ1 to manage water. This limitation on transfers should also allow for a reconsideration on a case by case basis, over the next 20-years or more, by Watermaster to ensure there will be no MPI.**

For example, if a proposed transfer or lease from a Party that pumps outside of MZ1 to a Party that pumps in MZ1 demonstrates groundwater levels remain greater than the new land subsidence metric (i.e. new land subsidence won't occur per 2018 SFI Section 2.2.1), then consideration should be given by Watermaster."

Response. Comment noted.

Comment No. 6. Section 2.3.2, Page 2-2. City's comment reads: **" Same comments as above regarding mitigation for reduction of net recharge."**

Response. Comment noted.

Comment No. 7. Section 2.5, Page 2-4. City’s comment reads: **“ Define the term “evergreen agreement”. Please provide clarification on the automatic adjustment (i.e. can be adjusted both up and down).”**

Response. Evergreen in this context signifies an agreement to store water that accommodates changes in the quantity of water in storage within FMSB, without requiring a new storage application.

November 20, 2019 comment letter from the Monte Vista Water District

Comment No. 1. MVWD comment: **"The SMP should specify which portions are proposed for incorporation into the 2020 Optimum Basin Management Program (OBMP) Implementation Plan as an amendment to the Peace Agreement. It may make more sense for Peace Agreement Parties to negotiate an amendment to the Peace Agreement (OBMP Implementation Plan) prior to approving the SMP, as the SMP must be consistent with the Peace Agreement, whether or not it is amended and only through consent of the Peace Agreement Parties."**

Response. The entire document is planned to be included in the 2020 OBMP IP.

Comment No. 2. MVWD comment: **"The SMP should acknowledge the priority of storage for Storage and Recovery Programs to the extent that Local Storage may be curtailed or prohibited (Peace Agreement 5.2 (b)(xi))."**

Response. The SMP has been drafted to provide the Parties with the use of all necessary storage for Local and Storage and Recovery activities consistent with the Parties' preferences and needs.

Comment No. 3. MVWD comment: **"The SMP should direct Watermaster to fully mitigate any reduction in Safe Yield due to either historical or projected storage activities in a manner that is equitably applied to all applicable storage activities so that Safe Yield is kept whole in respect to these storage activities."**

Response. Watermaster considers that the effects of storage activities in Safe Yield are addressed by the recalculation of Safe Yield pursuant to the Technical Memorandum methodology approved by the Court's April 28, 2017 order. Watermaster staff has been informed that the Appropriative Pool has reached agreement among Parties on how to compensate for individual storage activity effects on Safe Yield reduction.

Comment No. 4. MVWD comment: **"The SMP should focus on water stored in the basin that is subject to an agreement with Watermaster under the Judgment. This includes Local Storage (Excess Carryover and Supplemental), Storage and Recovery, and Preemptive Replenishment. Carryover is part of a producing Party's annual production right and not subject to an agreement with Watermaster. If Carryover is in excess of a Party's annual share of safe yield, the Party may then store the excess Carryover in a Local Storage (Excess Carryover) account under agreement with Watermaster. In contrast, water under a preemptive replenishment agreement is water stored in the basin under agreement with Watermaster; therefore, its management should be included in the SMP."**

Response. The Safe Storage Capacity identified in the OBMP IP included Carryover, which is “wet water” in storage. Similarly, the SMP provides for management of water in storage regardless of whether an agreement with Watermaster is required.

Comment No. 5. MVWD comment: **“For purposes of brevity and to avoid any potential confusion, the SMP should avoid describing the process and requirements for determining material physical injury (MPI), and instead refer to relevant sections of the Peace Agreement and Rules and Regulations governing MPI determination.”**

Response. Comment noted.

Comment No. 6. MVWD comment: **“The SMP should, under the principle of "beneficiary pays," include the implementation of a storage assessment as a more equitable way to allocate Chino Basin Watermaster costs related to storage.”**

Response. The judgment provides for Watermaster costs to be recovered using production-based assessments.

General response to MVWD redlined version of 2020 Draft Storage Management Plan, Version 2.

MVWD prepared a redline version of the 2020 SMP Version 2 document. The document has been modified to reflect comments received from various parties, this includes MVWD’s edits consistent with the overall document philosophy. Watermaster’s staff general responses to the suggested redline document are listed below:

1. Information included in the Background section is considered useful to the reader.
2. Carryover is “wet water” in the basin and was included in the Safe Storage Capacity in the OBMP IP. While Carryover does not require a storage agreement with Watermaster it is within Watermaster’s management and control, thus it is included in managed storage.
3. Preemptive replenishment accounts will no longer be used after current balances have been depleted.
4. The rebuttable presumption of no MPI was eliminated as part of the Second Amendment to the Peace Agreement.
5. Watermaster estimates the amount of storage to be used by Parties based on their projections will be 800,000 af including DYYP and not 720,000 af.
6. Watermaster is tasked with evaluating transfers and put and take operations before approving them.
7. The SMP provides a high-level description of Storage and Recovery Program requirements including Hydraulic Control impacts, this is intended to be helpful to future Storage and

Recovery Program applications.

8. Watermaster considers it necessary that the SMP be updated at the indicated frequency.

November 20, 2019 comment letter from the Chino Basin Water Bank

Comment No. 1. Comment reads: ***"Based on our understand that the storage space used by the Parties is projected to reach 720 KAF and the combined use of managed storage by the Parties and Metropolitan's DYYP is projected to reach a maximum of about 790 KAF, how was the 800 KAF for the S&R Program derived?"***

Response: Please see Appendix C of the final SMP report. The projected use of managed storage space by the Parties and Metropolitan is just under 800,000 af. The value of 800,000 af was arrived at by rounding up.

Comment No. 2. Comment reads: ***"Why are S&R required to mitigate MPI as if the 800 KAF were fully used, when it potentially is not?"***

Response: This is based on the Peace Agreement paragraph 5.2(c)(xiii) and (ix) that require Watermaster to condition Storage and Recovery Program storage agreements to protect the Parties and the basin from any potential MPI and to consider Broad Mutual Benefits.

Comment No. 3. Comment reads: ***"How do the estimated net recharge of 2.41% and 1.5% as average storage used translate to the annual loss percentages?"***

Response: See response to City of Ontario's comment No. 3.b.

Comment No. 4. Comment reads: ***"What process does Watermaster propose to adjust loss percentages in the future so that S&R Programs will have adequate time to prepare prior to changing conditions going into effect?"***

Response: Watermaster may adopt uniform rules to address triggers, notice, opportunity to respond and to implement corrective actions. Moreover, as part of the Storage and Recovery application and approval process, each Storage and Recovery application may have customized conditions responsive to the characteristics of the specific project.

Appendix C

2019 Update of Water Demand, Water Supply and Managed Storage Projections through 2050

Appendix C – 2019 Update of Water Demand, Water Supply and Managed Storage Projections through 2050

During the development of the 2020 SMP, Watermaster requested the Appropriative Pool Parties to review their water demand, associated water supply plan and their plans to use their stored water that were used in the 2018 SFI and update them if warranted. The planning period for the 2020 SMP is 2020 through 2050. Table C-1 shows the projected groundwater pumping by all Parties along with the recent historical pumping. The groundwater pumping projections for the Appropriative Pool Parties were unchanged from those used in the 2018 SFI except for three Parties: Cities of Chino and Pomona and the Monte Vista Water District (MVWD). The table below summarizes the differences between the pumping projections used in the 2018 SFI and the 2020 SMP. In summary the projected pumping in the 2020 SMP is less than that assumed in the 2018 SMP.

Comparison of total projected pumping for the 2018 SFI and 2020 SMP (afy)

Year	2018 SFI	2020 SMP	2020 SMP – 2018 SFI
2020	144,527	139,519	-5,008
2025	149,468	144,596	-4,872
2030	154,302	151,808	-2,494
2035	167,772	164,600	-3,122
2040	176,765	173,805	-2,969

Table C-2 lists the projected time series of managed storage by the Parties through 2050 based on the pumping projections in Table C-1. Table C-2 is constructed as follows.

- Column 1 lists the planning fiscal year ending on June 30.
- Column 2 list the projected total annual pumping based on the updated total pumping projections listed in Table C-1.
- Columns 3, 4 and 5 contain the projected annual Safe Yield from Scenario 1A of the 2018 SFI, Reoperation water used to partially offset annual Desalter replenishment obligation and the projected annual recycled water recharge.
- Column 6 lists the total annual pumping right which is equal to the sum of columns 3, 4 and 5.
- Column 7 lists the net annual replenishment obligation and is equal to the projected total annual groundwater pumping minus the projected total annual pumping rights. A negative value means that pumping is less than pumping rights and the difference results in an increase in managed storage. A positive value indicates that pumping exceeds pumping rights and a replenishment obligation has occurred that must offset through wet-water recharge and or from managed storage.

- Column 8 lists the annual amount of the replenishment obligation that is satisfied from storage. In the 2018 SFI it was determined that about 80 percent of the replenishment obligation would be satisfied from water in storage accounts and that assumption has not changed.
- Column 9 lists the annual amount of the replenishment obligation that is satisfied through wet-water recharge.
- Column 10 list the time history of end-of-year managed storage. The end-of-year managed storage is numerically equal to the end-of-year managed storage at the end of the prior year minus the net replenishment obligation (column 7) plus wet-water replenishment (column 9).

The maximum managed storage by the Parties is reached is 713,100 af in 2030. After 2030, the managed storage is projected to decline annually and reach about 484,000 af by 2050.

Metropolitan's Dry-Year Yield Program (DYYP) is the only active Storage and Recovery Program in the basin. The DYYP can store up to 100,000 af with maximum puts of 25,000 afy and maximum takes of 33,000 afy. The DYYP storage and recovery agreement provides that puts and takes can exceed these values if agreed to by Watermaster (as was done in fiscal years 2018 and 2009, respectively). The agreement that authorizes the DYYP will expire in 2028.

The combined use of managed storage by the Parties and Metropolitan's DYYP is projected to reach a maximum of about 791,300 af assuming that the DYYP has 100,000 af in storage in 2028 and that subsequent to 2028 Metropolitan removes that water from managed storage at the contract rate of 33,300 afy starting in 2029. This is illustrated in the table below.

Total potential combined end-of-year managed storage of the Parties and Metropolitan (af)

Year	Parties	Metropolitan	Total
2026	664,842	100,000	764,842
2027	678,623	100,000	778,623
2028	691,254	100,000	791,254
2029	702,734	66,667	769,434
2030	713,063	33,333	746,463
2031	713,061	67	713,128

Appendix E

Table C-1 Historical and Projected Groundwater Pumping in the Chino Basin

(af)

Producer	Historical Pumping										Pumping Projection (2019 Update)				
								Statistics (2013-2019)							
	2013	2014	2015	2016	2017	2018	2019	Min	Max	Mean	2020	2025	2030	2035	2040
Overlying Agricultural Pool															
Aggregate Agricultural Pool Pumping	23,946	22,063	17,361	16,904	17,786	18,827	15,572	15,572	23,946	*18,923*	15,678	12,788	9,968	7,907	4,808
Overlying Non-Agricultural Pool															
Ameron	59	18	29	30	25	-	-	18	59	*32*	-	-	-	-	-
Angelica Textile Service	48	37	26	28	20	-	-	20	48	*32*	-	-	-	-	-
California Speedway Corporation	509	436	454	300	410	438	389	300	509	*419*	500	500	500	500	500
California Steel Industries, Inc.	1,303	1,417	1,279	1,187	1,298	1,266	1419	1,187	1,419	*1,310*	1,450	1,450	1,470	1,500	1,530
General Electric Company	1,285	1,626	1,355	917	1,667	957	1127	917	1,667	*1,276*	1,667	1,667	1,667	1,667	1,667
NRG California South LP	470	290	221	204	211	212	18	18	470	*232*	232	232	232	232	232
Riboli Family and San Antonio Winery, Inc.	10	10	7	4	5	6	26	4	26	*10*	10	10	10	10	10
Southern Service Company	-	-	-	-	-	21	23	21	23	*22*	32	32	32	32	32
TAMCO	-	-	-	-	-	18	10	10	18	*14*	32	32	32	32	32
Subtotal Overlying Non-Agricultural Pool Pumping	*3,685*	*3,834*	*3,371*	*2,670*	*3,636*	*2,919*	*3,010*	*2,670*	3,834	*3,304*	*3,923*	*3,923*	*3,943*	*3,973*	*4,003*
Appropriative Pool															
Arrowhead Mountain Spring Water Company	413	379	426	356	367	308	285	285	426	362	400	400	400	400	400
City of Chino	7,022	6,725	6,546	5,010	4,972	5,162	4,315	4,315	7,022	5,679	8,262	9,696	11,058	11,945	14,355
City of Chino Hills	3,039	2,163	3,745	1,633	2,246	2,839	1,608	1,608	3,745	2,468	2,570	3,600	3,600	3,600	3,600
City of Ontario	21,146	21,980	17,675	22,849	24,840	26,280	20,722	17,675	26,280	22,213	12,363	14,514	17,947	23,715	31,016
City of Pomona	12,227	12,909	12,520	9,964	8,067	9,286	10,840	8,067	12,909	10,830	11,309	11,395	11,481	11,568	11,568
City of Upland	2,358	2,822	3,416	2,601	1,260	1,764	2,381	1,260	3,416	2,372	2,800	2,800	2,800	2,800	2,800
Cucamonga Valley Water District	18,740	16,122	14,640	20,537	16,562	6,838	9,624	6,838	20,537	14,723	12,755	13,687	13,859	19,282	19,282
Fontana Water Company	11,752	15,377	13,344	15,317	13,250	11,392	9,961	9,961	15,377	12,913	9,920	10,416	13,153	15,591	17,942
Jurupa Community Services District	17,411	18,406	12,805	9,284	11,498	15,286	13,894	9,284	18,406	14,083	10,310	12,310	14,310	14,310	14,310
Marygold Mutual Water Company	1,250	1,315	1,250	753	619	944	950	619	1,315	1,011	1,241	1,322	1,403	1,484	1,565
Monte Vista Water District	10,324	12,522	7,402	8,371	7,086	6,483	6,631	6,483	12,522	8,403	6,500	6,257	6,397	6,537	6,668
Niagara	1,000	1,343	1,860	1,775	1,532	1,571	1,683	1,000	1,860	1,537	1,537	1,537	1,537	1,537	1,537
San Antonio Water Company	1,540	1,159	1,479	1,031	538	428	376	376	1,540	936	1,232	1,232	1,232	1,232	1,232
San Bernardino County (Olympic Facility)	12	16	11	9	13	11	11	9	16	12	12	12	12	12	12
Golden State Water Company	1,059	736	720	807	850	148	0	0	1,059	617	374	374	374	374	374
Subtotal Appropriative Pool Pumping	*109,292*	*113,974*	*97,840*	*100,297*	*93,699*	*88,740*	*83,280*	*83,280*	*113,974*	*98,160*	*81,585*	*89,552*	*99,564*	*114,387*	*126,661*
Chino Desalter Authority															
Total Desalter Pumping	*27,098*	*29,282*	*30,022*	*28,191*	*28,284*	*30,088*	*31,233*	*27,098*	*31,233*	*29,171*	*40,000*	*40,000*	*40,000*	*40,000*	*40,000*
2020 SMP Projected Total Pumping	164,021	169,153	148,593	148,061	143,405	140,574	133,095	*133,095*	*169,153*	*149,557*	141,186	146,263	153,474	166,266	175,472
Less GE Injection											-1,667	-1,667	-1,667	-1,667	-1,667
2020 SMP Projected Net Total Basin Pumping											139,519	144,596	151,808	164,600	173,805
2018 SFI Projected Net Total Basin Pumping											144,527	149,468	154,302	167,722	176,765
Change in Projected Net Total Basin Pumping from the 2018 SFI Projection											-5,008	-4,872	-2,494	-3,122	-2,960

increase relative to 2018 SFI projection

decrease relative to 2018 SFI projection

20191209 App C Rev Managed Storage Projection .xlsx -- Table C-1 Hist & Proj Pump Sum

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Table C-2 Projected Groundwater Pumping, Pumping Rights, Replenishment and End-of-Year Volume in Managed Storage – SFI Scenario 1A Revised

(af)

Fiscal Year ending June 30	Projected Groundwater Pumping per 2020 SMP Survey for Normal Year	Pumping Rights				Net Replenishment Obligation[2]	Replenishment from Storage[3]	Replenishment with Wet-Water Recharge	End-of-Year Managed Storage
		Safe Yield[1]	Reoperation Water Use to Offset the Desalter Replenishment Obligation	Recycled Water Recharge	Total				
(1)	(2)	(3)	(4)	(5)	(6) = (3)+(4)+(5)	(7) = (2)-(6)	(8)	(9)	$(10)_t = (10)_{t-1} - (7)_t + (9)_t$
2019									503,275
2020	139,519	135,000	12,500	13,504	161,004	-21,485	0	0	524,760
2021	140,534	140,717	12,500	13,795	167,012	-26,478	0	0	551,237
2022	141,550	140,717	12,500	14,087	167,304	-25,754	0	0	576,991
2023	142,565	140,717	12,500	14,379	167,595	-25,030	0	0	602,021
2024	143,581	140,717	12,500	14,670	167,887	-24,306	0	0	626,327
2025	144,596	140,717	12,500	14,962	168,179	-23,583	0	0	649,910
2026	146,038	140,717	5,000	15,253	160,970	-14,932	0	0	664,842
2027	147,481	140,717	5,000	15,545	161,262	-13,781	0	0	678,623
2028	148,923	140,717	5,000	15,837	161,554	-12,631	0	0	691,254
2029	150,365	140,717	5,000	16,128	161,845	-11,480	0	0	702,734
2030	151,808	140,717	5,000	16,420	162,137	-10,329	0	0	713,063
2031	154,366	137,943	0	16,420	154,363	3	2	1	713,061
2032	156,924	137,943	0	16,420	154,363	2,561	2,049	512	711,012
2033	159,483	137,943	0	16,420	154,363	5,119	4,096	1,024	706,917
2034	162,041	137,943	0	16,420	154,363	7,678	6,142	1,536	700,774
2035	164,600	137,943	0	16,420	154,363	10,236	8,189	2,047	692,585
2036	166,441	137,943	0	16,420	154,363	12,077	9,662	2,415	682,923
2037	168,282	137,943	0	16,420	154,363	13,918	11,135	2,784	671,789
2038	170,123	137,943	0	16,420	154,363	15,759	12,607	3,152	659,181
2039	171,964	137,943	0	16,420	154,363	17,600	14,080	3,520	645,101
2040	173,805	137,943	0	16,420	154,363	19,441	15,553	3,888	629,548
2041	173,805	139,164	0	16,420	155,584	18,221	14,577	3,644	614,971
2042	173,805	139,164	0	16,420	155,584	18,221	14,577	3,644	600,394
2043	173,805	139,164	0	16,420	155,584	18,221	14,577	3,644	585,818
2044	173,805	139,164	0	16,420	155,584	18,221	14,577	3,644	571,241
2045	173,805	139,164	0	16,420	155,584	18,221	14,577	3,644	556,664
2046	173,805	139,164	0	16,420	155,584	18,221	14,577	3,644	542,087
2047	173,805	139,164	0	16,420	155,584	18,221	14,577	3,644	527,510
2048	173,805	139,164	0	16,420	155,584	18,221	14,577	3,644	512,934
2049	173,805	139,164	0	16,420	155,584	18,221	14,577	3,644	498,357
2050	173,805	139,164	0	16,420	155,584	18,221	14,577	3,644	483,780

503,275 af is the estimated volume in managed storage on June 30, 2019

1 -- Safe yield estimate from net recharge estimated in Scenario 1A.

2 -- This is the annual net replenishment obligation based on the assumptions described in the 2018 SFI report; negative values mean aggregate underproduction and an increase in stored water accounts.

3 -- 80 percent of a positive replenishment obligation is satisfied from storage and 20 percent is satisfied by wet-water recharge.