Our Region's Trusted Water Leader
San Diego County Water Authority

August 6, 2018

California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
Attn: Ms. Jody Ebsen

Subject: Triennial Review Comment: CW845836

Dear Ms. Ebsen:

The Water Authority is very supportive of Project 4: Climate Change Readiness: Sustainable Local Water Supply on the draft 2018 Triennial Review prioritized list, dated June 22, 2018. This project would review beneficial uses and water quality objectives to support local supply development and use of recycled water. It is consistent with your Practical Vision, Key Beneficial Use and Areas Concept, and supports climate change goals and drought preparedness.

The Water Authority and its member agencies that own and operate drinking water reservoirs have developed a series of recommendations regarding water supply reservoirs to be addressed through clarifications to the Basin Plan. These recommendations have been provided for discussion and to request feedback from San Diego Water Board staff. The recommendations were included in the attached coalition letter from the Water Authority and member agencies on the Triennial Review, dated May 16, 2018. The clarifications would streamline permitting of potable reuse projects, encourage local supply development, and support water supply management by water agencies. These recommendations could be addressed under Project 4 in support of sustainable water supply for climate change readiness.

We have been requesting that the San Diego Water Board develop a reservoir Basin Plan amendment since before the last Triennial Review. We understand that the San Diego Water Board has limited resources and are supportive of staff's recommended collaborative approach to leverage resources to support this project. Since the recommendations we developed are primarily clarifications to beneficial uses and implementation of water quality objectives, we anticipate this component of the project would require significantly less time to complete than most other Basin Plan amendments. We look forward to working together with San Diego Water Board staff, the Water Authority member agencies, and the South Orange County Wastewater Authority in an expeditious manner to advance this project.

Thank you for the opportunity to comment, and to work together with the Water Authority and member agencies to support our mutual goals. Please contact Lesley Dobalian, Principal Water Resources Specialist, with any questions at (858) 522-6747 or LDobalian@sdcwa.org.

Sincerely,

Robert R. Yamada
Director of Water Resources
San Diego County Water Authority

Attached: Triennial Review Comment Letter

Submitted electronically via: sandiego@waterboards.ca.gov

San Diego County Water Authority
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May 16, 2018

California Regional Water Quality Control Board
San Diego Region
2375 Northside Drive, Suite 100
San Diego, CA 92108
Attn: Ms. Jody Ebsen

Subject: Triennial Review Comment: CW845836

Dear Ms. Ebson:

The purpose of this letter is to request that the Triennial Review Project: Beneficial Uses and Water Quality Objectives Related to Reservoirs Project (Reservoir Project) be prioritized as Tier 1 for completion over the upcoming Triennial Review period. This project was identified by San Diego Water Board staff on the Preliminary List of Triennial Review projects, dated April 9, 2018. The Reservoir Project was developed through collaboration among the Water Authority and its member agencies that own and operate drinking water reservoirs, and Water Board staff.

Project would Protect Water Quality and Encourage Local Supply Development

There are 24 surface water reservoirs in San Diego County designed to support the region's water supply needs by capturing storm water runoff, storing imported water, serving as forebays to water treatment plants, and storing purified water for potable reuse projects. The local reservoirs are operated to maximize the use of local supply, offset dry-year shortfalls, and maintain emergency and carryover storage. The next increment of water supply for the San Diego Region will come from member agency potable reuse projects that primarily rely on reservoir augmentation. By 2035, nearly 20 percent of the region's supply is expected to come from potable reuse.

The Water Board's proposed Reservoir Project is important because it will support reservoir operations and maintenance, enhance protection of reservoir beneficial uses, and streamline permitting of reservoir potable reuse projects through clarifying how beneficial uses are to be protected and water quality objectives are to be implemented.

Project is Consistent with Practical Vision, Key Beneficial Use and Areas Concept, and Supports Climate Change Goals

The Reservoir Project is consistent with the Board's Practical Vision of achieving a sustainable local water supply by facilitating streamlined permitting of potable reuse through reservoir augmentation. It supports strategizing for healthy waters by continuing to protect the ocean environment through potable reuse, and encouraging protection of municipal water supply beneficial uses as they apply to reservoirs. By supporting development of drought proof supplies, the Reservoir Project also helps meet Water Board goals of climate resilience. Finally, the Reservoir Project is consistent with the Key Beneficial Use and Key Areas concept, which prioritizes drinking water reservoirs for water supply.

Progress to Date on Reservoir Project

Since it was included on the 2014 Triennial Review as a Tier 2 project, the Water Authority and member agencies refined the project to identify exact clarifications needed to the Basin Plan, which were compiled into a Report and provided to Water Board staff. Together with our member agencies, we met with Water Board staff on several occasions, along with the Metropolitan Water District of Southern California, to discuss the proposed Basin Plan modifications. We believe that Water Board staff found the proposed changes to be reasonable and are interested in moving forward, depending on resource availability. A copy of the Report with the proposed changes to the Basin Plan is attached to this letter

Resources to Work on Reservoir Basin Plan Amendment Project

The Water Authority would like to provide support to move the Reservoir Project forward for completion. Although it was identified on the last Triennial Review, there has been limited progress on developing a Basin Plan amendment due to lack of availability of Water Board staff resources. While we understand staff resources are limited, we anticipate this project would require only a portion of staff resources compared with other types of Basin Plan amendments since the proposed modifications are primarily clarifications to beneficial uses and implementation of water quality objectives. This project also aligns with the use of resources consistent with your Key Beneficial Uses and Key Areas concept related to water supply and drinking water reservoirs. In addition, we have a Water Board contract to fund your staff time to work on projects of mutual interest, and this is our highest priority under the contract. The Water Authority also has available funding that we can dedicate now towards developing technical work that your staff may determine is necessary to complete the Basin Plan amendment.

Thank you for your consideration of the Reservoir Project for prioritization on the Triennial Review. We also appreciate the time and consideration of your staff in

reviewing the Report, and meeting with the Water Authority and member agencies to discuss the Basin Plan amendment, and look forward to working together to complete this project. Please contact Lesley Dobalian, Principal Water Resources Specialist, with any questions at (858) 522-6747 or LDobalian@sdcwa.org.

Sincerely,

Robert R. Yamada
Director of Water Resources
San Diego County Water Authority

Brian Olney
Director of Water Quality and System Operations
Helix Water District

Albert C. Lau, P.E.
Director of Engineering & Planning
Padre Dam Municipal Water District

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Peter Vroom
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Cor Shaffer, PE, T5, D5
Operations Manager
Santa Fe Irrigation District

Pete Baranov
Director of Water Quality
Sweetwater Authority

Attachment: Report: Draft Proposed Basin Plan Modifications for Water Supply Reservoirs, dated January 8, 2018

Submitted electronically via: sandiego@waterboards.ca.gov

DRAFT

PROPOSED BASIN PLAN MODIFICATIONS FOR WATER SUPPLY RESERVOIRS

January 8, 2018

California Regional Water Quality Control Board
Tier 2 Modifications Related to Potable Reservoir Operations

The *Water Quality Control Plan for the San Diego Basin* (Basin Plan) designates beneficial uses of waters of the State, establishes numerical and narrative water quality objectives to protect the designated beneficial uses, and establishes implementation policies for enforcing the water quality objectives. The California Regional Water Quality Control Board, San Diego Region (Regional Water Board) undergoes a triennial prioritization process for reviewing and updating the Basin Plan.

As part of the most recent triennial review process, the Regional Water Board in 2015 adopted a Tier 2 priority of evaluating Basin Plan beneficial uses and water quality objectives as they relate to reservoir operations and maintenance.[1] In adopting this Tier 2 priority, the Regional Water Board committed to meeting with regional water purveyors to explore the practicality of resource sharing in addressing reservoir-related Basin Plan issues.

Chapter 1 of the *San Diego Water Board Practical Vision*[2] introduces the concept of "key beneficial uses/key areas" in prioritizing Regional Water Board resources. In implementing its key beneficial uses/key area concept, the Regional Water Board (1) identified drinking water as a key beneficial use[3] and (2) identified drinking water reservoirs as a key area[4] where protection of water quality is of the highest priority.[5] The Water Authority and regional water agencies who own and operate potable water reservoirs share the Regional Water Board's priorities for protecting and enhancing the quality of water in San Diego Region reservoirs.

To this end, the Water Authority and regional water agencies have identified several issues of concern that that offer opportunities for Basin Plan modifications that (1) improve protection of beneficial uses of reservoirs, (2) improve the abilities of agencies to operate and manage drinking water reservoirs, and (3) encourage and promote the development of new and diverse water

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1 See Attachment No. 1 to Regional Water Board Resolution No. R9-2015-0043, which was adopted by the Regional Water Board on May 13, 2015.

2 The *San Diego Water Board Practical Vision* was endorsed by the Regional Water Board through the adoption of Resolution No. R9-2013-0153 on November 13, 2013.

3 Regional Water Board Resolution No. R9-2017-0030 defines a key beneficial use as a beneficial use that is most critical to protecting human and environmental health.

4 Regional Water Board Resolution No. R9-2017-0030 defines a key area as waters where protection or restoration of water quality is most important in ensuring implementation of a given beneficial use.

5 Resolution No. R9-2017-0030 endorses drinking water as a key beneficial use and drinking water reservoirs as a key area, as set forth in the February 2017 Regional Water Board staff report entitled "Key Beneficial Uses and Key Areas – Focusing on What is Most Important".

supplies, consistent with the sustainable local water supply element of the November 2013 *San Diego Water Board Practical Vision.*

In assessing Basin Plan needs to protect water quality and encourage local supply development, the Water Authority and its member agencies propose the following clarifications on how Basin Plan beneficial uses are to be protected and water quality objectives are to be implemented:

I. Clarify Beneficial Use designations to (1) identify which San Diego Region reservoirs are connected to the imported water aqueduct system; (2) explicitly state that beneficial uses apply to all waters of the State, regardless of the source of the water; and (3) identify the potential for the implementation of potable reuse as part of the Municipal and Domestic Supply (MUN) beneficial use.

II. Clarify how existing Basin Plan objectives that implement secondary drinking water standards for total dissolved solids (TDS) and sulfate are to be implemented within water supply reservoirs.

III. Clarify how existing Basin Plan biostimulation objectives are to be implemented in the regulation of potable reuse projects.

IV. Clarify how Basin Plan dissolved oxygen, iron, and manganese requirements relate to thermally stratified reservoirs.

I. BENEFICIAL USE CLARIFICATIONS

Overview. The State Water Resources Control Board (State Water Board) has adopted a uniform list and description of beneficial uses that are applied throughout the State. The Municipal and Domestic Supply (MUN) beneficial use includes uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

The Basin Plan identifies 25 surface water reservoirs within the San Diego Region, and establishes a MUN beneficial use for each of these 25 surface reservoirs. The Basin Plan also establishes that designated beneficial uses apply not only to native waters, but to any imported waters that are stored in these reservoirs.

Potential Problem with Existing Basin Plan. The Basin Plan makes no distinction between reservoirs that are comprised of local runoff, reservoirs that are overwhelmingly comprised of imported water, or reservoirs that are comprised of a blend of both. Reservoirs used for storing imported water (particularly reservoirs that are overwhelmingly dominated by imported water) have different water quality protection needs than other San Diego Region reservoirs, and water quality and nuisance conditions in these reservoirs may be more readily be controlled by water agency management actions than within reservoirs that are significantly influenced by local runoff.

Additionally, while the Basin Plan notes that beneficial uses apply to native or imported waters stored in a reservoir, the Basin Plan:

- makes no mention of the potential for augmenting reservoir supplies with highly purified recycled water, and
- does not explicitly state that designated beneficial uses of reservoirs also apply to reservoirs filled with highly purified recycled water.

Proposed Revisions. No changes to Basin Plan beneficial use designations are proposed. To set the stage for Basin Plan implementation provisions that accommodate the Regional Water Boards "key beneficial uses/key areas" concept and distinguish between different reservoir types, however, it is recommended that Table 2-4 within Chapter 2 (Beneficial Uses) be revised to identify reservoirs that are:

- connected to the imported aqueduct system, and
- overwhelmingly comprised of waters from outside the watershed.

It is also recommended that minor text revisions be added to Chapter 2 (Beneficial Uses) to:

- explicitly state that designated beneficial uses apply to all waters of the state, regardless of the source of the water (e.g., imported, native, or recycled water/wastewater), and
- note that, consistent with State Water Board policies and regulations, storage reservoirs can be used for implementing potable reuse.

Specific proposed Basin Plan clarifications include:

1. Within Chapter 2 (Beneficial Uses), modify the fourth paragraph of the "Beneficial Uses for Specific Water Bodies" section (page 2-8) as follows:

   Beneficial uses apply to all designated waters of the State (inland surface waters, coastal waters, reservoirs, lakes, and ground waters), regardless of whether the source of the water is native water, imported water, recycled water, or water from some other source. The lack of a beneficial use does not rule out the possibility of existing or future beneficial uses. Existing beneficial uses which have not been formally designated in this Basin Plan are protected as well as designated beneficial uses.

2. Within Chapter 2 (Beneficial Uses), modify the first paragraph of the "Reservoirs and Lakes" section (page 2-13) as follows:

   The water resources with the greatest diversity of beneficial uses in the Region are the man-made water storage reservoirs and lakes. Located in nearly all of the Region's hydrologic units, these reservoirs and lakes intercept surface runoff and store imported water supplies. Consistent with policies established by the State Water Resources Control Board Division of Drinking Water, some reservoirs may also be used for implementing potable reuse, where highly purified recycled water is used to augment supplies in reservoirs that serve as a source of raw water supply to potable water treatment facilities. As such, the storage reservoirs serve as (1) sources of supply for municipalities, agricultural areas, and industrial operations; (2) recreational bodies; and (3) habitats for fish and wildlife. In a few cases, such as reservoirs used primarily for drinking water, REC-1 uses can be restricted or prohibited by the entities that manage these waters. Many of these reservoirs, however, are designated as potential for REC-1, reflecting federal Clean Water Act Goals.

3. Within Chapter 2 (Beneficial Uses), modify Table 2-4 titled "Beneficial Uses of Reservoirs and Lakes" (pages 2-56 and 2-57) by adding the following new footnote "2" to the MUN bullets of the following reservoirs: Diamond Valley Lake, Hodges Reservoir, Lake Skinner, Olivenhain Reservoir, San Dieguito Reservoir, Lake Dixon, Miramar Reservoir, Lake Murray, Lake Jennings, Lake Poway, San Vicente Reservoir, El Capitan Reservoir[6], Sweetwater Reservoir, and Lower Otay Reservoir:

   [2] *Reservoir connected to the imported water aqueduct system.*

4. Within Chapter 2 (Beneficial Uses), modify Table 2-4 titled "Beneficial Uses of Reservoirs and Lakes (pages 2-56 and 2-57), by adding the following new footnote "3" to the MUN bullets of the following reservoirs: Diamond Valley Lake, Lake Skinner, Lake Dixon, Lake Poway, Miramar Reservoir, Lake Murray, Lake Jennings, and San Vicente Reservoir.

   [3] *Reservoir typically comprised of more than 90 percent imported or other waters conveyed from outside the watershed.*

5. Within Chapter 2 (Beneficial Uses), modify Table 2-4 titled "Beneficial Uses of Reservoirs and Lakes (pages 2-56 and 2-57), by adding the following new footnote "4" to the MUN bullets of the following reservoirs: Diamond Valley Lake, Lake Skinner, Olivenhain Reservoir, San Dieguito Reservoir, Lake Dixon, Lake Poway, Miramar Reservoir, Lake Murray, Lake Jennings, San Vicente Reservoir, Sweetwater Reservoir, and Lower Otay Reservoir.

   [4] *Terminal reservoir which provides raw water supply directly to a potable water filtration plant.*

Benefits of Implementing the Recommended Basin Plan Modifications. The proposed clarifications within Chapter 2 (Beneficial Uses) of the Basin Plan would explicitly state the intent of the Basin Plan that designated beneficial uses apply to all waters of the State, regardless of source (e.g. native water, imported water, wastewater, purified recycled water, or waters from other sources). The clarifications also set the stage for consideration of imported water storage benefits and potable reuse benefits in establishing and interpreting Basin Plan water quality objectives and implementation policies.

II. SECONDARY DRINKING WATER STANDARDS

Overview. The Basin Plan establishes that all waters designated as MUN shall not contain concentrations of chemical constituents in excess of the State of California Secondary Maximum Contaminant Levels, Consumer Acceptance Limits established within Section 64449, Title 22 of the *California Code of Regulations* (CCR).

The State Water Resources Control Board, Division of Drinking Water (DDW) establishes secondary drinking water (consumer acceptance) standards within Section 64449 of the CCR to

[6] With the dam raise at San Vicente Reservoir, depending on lake water levels, it will be possible to convey imported water stored in San Vicente Reservoir by gravity to El Capitan Reservoir.

protect the aesthetics and consumer acceptability of the drinking water supply. Three tiers of secondary drinking water standards (recommended levels, upper levels, and short-term levels) are established for TDS and sulfate.[7] Basin Plan objectives for most San Diego Region imported water reservoirs are established at the "recommended" levels, as follows:

Constituent	Concentration (mg/l)				
	Secondary Maximum Contaminant Levels Consumer Acceptance Contaminant Level Ranges[1]			Basin Plan Objectives for Most Imported Water Reservoirs[2]	Typical Range in Imported Water
	Recommended	Upper	Short-Term		
TDS	500	1000	1500	500	400 – 800
Sulfate	250	500	600	250	100 – 300

1 From Table 64449-B, Title 22, Division 4, Chapter 15, Article 16, Section 64449 of the *California Code of Regulations*.

2 Basin Plan objectives for Lake Skinner, Olivenhain Reservoir, San Dieguito Reservoir, Lake Dixon, Hodges Reservoir, Miramar Reservoir, Lake Poway, Sweetwater Reservoir, and Otay Reservoir. Basin Plan objectives for San Vicente Reservoir and El Capitan Reservoir are 300 mg/l for TDS and 65 mg/f for sulfate.

As shown in the above table, Basin Plan objectives for TDS and sulfate have been established at or below the "recommended" level of 500 mg/l for TDS, 250 mg/l for chloride, and 250 mg/l for sulfate within the majority of the imported water reservoirs within the San Diego Region.

Potential Problem with Existing Basin Plan. Depending on hydrologic conditions in the western United States and the blend of Colorado River and State Water Project that is being delivered to the San Diego Region, concentrations of TDS and sulfate in the imported supply may exceed the "recommended" secondary drinking water standards of 500 mg/l for TDS and 250 mg/l for sulfate. Imported water supplies, however, never exceed the "upper" secondary drinking water standards of 1000 mg/l for TDS and 500 mg/l for sulfate.

As the Basin Plan is currently written, a reservoir filled with imported water that does not comply with existing Basin Plan TDS or sulfate objectives can be listed as Clean Water Act 303(d) impaired even though the upper limit drinking water standard is not exceeded, and no impacts to beneficial uses occur. Further, since concentrations of TDS and sulfate in imported water reservoirs are largely be dependent on the quality of imported water stored in the reservoir, waste load allocations implemented through a Total Daily Maximum Load (TMDL) process will be unlikely to result in meaningful water quality improvement.

Proposed Revisions. The intent of the Basin Plan should be (1) ensure that runoff into reservoirs is of sufficient quality to support and protect beneficial uses, but (2) recognize that within imported water reservoirs, reservoir quality is largely a function of the quality of the imported supply, and that the quality of imported water stored in these reservoirs by and in itself should not automatically trigger 303(d) listings and the need to implement TMDLs.

[7] The secondary drinking water standards also include a recommended standard of 250 mg/l for chloride and an upper chloride level of 1000 mg/l. Since San Diego Region imported water supplies never reach these values, chloride does not represent a compliance issue for imported water storage.

While this is difficult to achieve within the context of Clean Water Act requirements, it is possible to incorporate improved clarification and guidance in the Basin Plan which can be used to minimize the potential for listing reservoirs as 303(d) impaired as a result of imported water that does not meet Basin Plan objectives. To address this, specific proposed Basin Plan modifications include:

1. Within Table 3-2 of Chapter 3 (Water Quality Objectives), add footnote "e" to the TDS and sulfate objectives for watersheds that feature imported water reservoirs:

   e TDS and sulfate concentrations in imported water storage reservoirs (see Table 2-4) may be allowed to exceed the listed objectives more than 10 percent of the time, provided that the exceedance is due to the quality of the imported water stored or blended within the reservoir.

   Footnote "e" would be added to the TDS and sulfate objectives within the following watersheds:

   - Hydrologic Subarea (HSA) 902.35 (Diamond Valley Lake),
   - Hydrologic Area (HA) 902.4 (Lake Skinner),
   - HSA 904.5 (Olivenhain Reservoir and San Dieguito Reservoir),
   - HA 904.6 (Lake Dixon),
   - HSA 905.2 (Hodges Reservoir),
   - HA 6.1 (Miramar Reservoir),
   - HA 6.2 (Lake Poway),
   - HA 907.2 (San Vicente Reservoir),
   - HA 907.3 (El Capitan Reservoir),
   - HA 902.2 (Sweetwater Reservoir), and
   - HA 910.3 (Lower Otay Reservoir).[8]

Benefits of Implementing the Recommended Basin Plan Modifications. The proposed clarifications of TDS and sulfate water quality standards for imported water reservoirs will:

- make the Basin Plan more consistent with the intent of the drinking water standards,
- lessen the potential for "automatic" 303(d) listings that are caused purely by imported water quality that does not comply with existing Basin Plan objectives TDS and sulfate objectives,
- minimize the potential for wasting RWQCB resources on TMDL processes where the "waste loads" are a function of imported water deliveries (which are not subject to TMDL restrictions), and
- supports the use of the reservoir for imported water storage.

III. NUTRIENT OBJECTIVES

[8] Lake Murray and Lake Jennings are excluded from this list, as imported water TDS and sulfate concentrations are always below the corresponding Basin Plan objectives for the Lake Murray and Lake Jennings watersheds.

Overview. The Basin Plan establishes as three-tiered approach for preventing biostimulation in inland surface waters:

- numerical concentration objectives for total phosphorus of 0.025 mg/l in standing bodies of water, 0.05 mg/l in waters flowing into standing bodies of water, and 0.1 mg/l within flowing waters.
- a narrative objective that concentrations of nitrogen and phosphorus, by themselves or in combination with any other nutrient, shall be maintained at levels below those that stimulate algae and emergent plant growth, and
- provisions that natural ratios of nitrogen to phosphorus are to be identified and upheld, and that in the absence of data a nitrogen:phosphorus (N:P) ratio of 10:1 shall be used.

Implementation of the total phosphorus numerical concentration objectives and the narrative biostimulation objective is straight-forward, but the Basin Plan N:P guidance can be subject to a broad degree of interpretation.

Adverse biostimulation can be prevented through controlling a single essential nutrient. The N:P ratio represents a useful parameter for inferring whether biostimulation is controlled by the lack of phosphorus or by a lack of nitrogen. As a general rule, N:P ratios above 10:1 indicate that phosphorus is a limiting nutrient, while values below 10:1 indicate nitrogen as a limiting nutrient. The intent of the Basin Plan N:P guidance is to (1) prevent the creation of conditions where biostimulation can occur, and (2) ensure that naturally-occurring limited nutrient conditions (if they exist) are maintained.

Potential Problems with Existing Basin Plan Requirement. As currently worded, the existing Basin Plan N:P guidance on N:P ratios is subject to a broad degree of interpretation, and:

- Receiving water nitrogen concentrations in excess of 10 times the applicable phosphorus numerical objective can be used as rationale to list waters as Clean Water Act 303(d) impaired, even though phosphorus may be the limiting nutrient and no data exists to indicate the occurrence of adverse biostimulation conditions.
- Existing Basin Plan N:P guidance is not explicit on how NPDES concentration limits for total nitrogen may be established for potable reuse projects, or how a "limited nutrient" approach can be used to ensure that potable reuse projects do not cause adverse biostimulation.

Agencies implementing potable reuse/reservoir augmentation projects need assurance that NPDES permits regulating such projects will contain achievable nitrogen concentration standards. Agencies also need assurance that Basin Plan nutrient objectives are sufficiently clear to prevent reinterpretation of the objectives by future regulators.

Proposed Revisions. Modify footnote 'a" of Table 3-2 as follows

1. Within Chapter 3 (Water Quality Objectives), modify the third paragraph of the "Biostimulatory Substances" section (page 3-9) as follows:

Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold total Phosphorus (P) concentrations shall not exceed 0l05 mg/l in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisances in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P – 10:1 shall be used. In water supply reservoirs, operating agencies may comply with the biostimulation objective by (1) ensuring compliance with applicable phosphorus numerical objectives, and (2) managing reservoirs at high N:P ratios to sustain phosphorus-limited conditions.

Certain exceptions to the above water quality objectives are described in Chapter 4 (Implementation) in the sections titled "Discharges to Coastal Lagoons from Pilot Water Reclamation Plants"; "Discharges to Surface Waters"; and "Potable Reuse/Reservoir Augmentation".

2. Within Chapter 3 (Water Quality Objectives), modify footnote "a" of Table 3-2 "Water Quality Objectives, Inland Surface Waters" (page 3-16) as follows:

a *Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold total Phosphorus (P) concentrations shall not exceed 0l05 mg/l in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisances in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P – 10:1 shall be used. In water supply reservoirs, operating agencies may comply with the biostimulation objective by (1) ensuring compliance with applicable phosphorus numerical objectives, and (2) managing reservoirs at high N:P ratios to sustain phosphorus-limited conditions. Note – Certain exceptions to the above water quality objectives are described in Chapter 4 in the sections titled Discharges to Coastal Lagoons from "Pilot Water Reclamation Plants"; ~~and~~ "Discharges to Surface Waters"; and "Potable Reuse/Reservoir Augmentation".*

3. Within Chapter 4 (Implementation), the "Discharges to Inland Surface Waters" section addresses the use of recycled water for augmenting streamflow in watersheds downstream from lakes or reservoirs used as a source of municipal water supply. To address the use of highly purified recycled water for augmenting municipal supply reservoirs (potable reuse), insert the following section within Chapter 4 (Implementation) immediately prior to the section entitled "Water Reclamation Under Resolution No. 81-16" (page 4-43):

POTABLE REUSE/RESERVOIR AUGMENTATION

The Regional Board recognizes the water supply and quality benefits associated with the use of highly purified recycled water to augment raw water supplies in water supply reservoirs (potable reuse). When implemented in accordance with potable reuse regulations established by the State Water Board Division of Drinking Water, such potable reuse can provide reservoirs with a sustainable source of supply that provides the same (or better) degree of public health protection as imported water.

Benefits provided by potable reuse include (1) reducing the region's dependence on and need for imported water, (2) helping to meet State-mandated recycled water use goals, and (3) reducing wastewater discharges to the ocean. Additionally, purified water treatment technology required to meet State Water Board Division of Drinking Water standards will reduce concentrations of salinity and dissolved minerals in the region's potable water supply, which would translate to region-wide reductions in salinity loads to groundwaters, reductions in salinity loads to surface waters, and reductions in salinity concentrations in recycled water supplies.

In conformance with provisions of the Clean Water Act, the Regional Water Board will regulate discharges of highly purified recycled water to reservoirs through issuance of NPDES permits that implement (1) applicable water quality plans and policies, (2) applicable Basin Plan water quality objectives, and (3) State Water Board Division of Drinking Water requirements for treatment performance, treatment technology, pathogen removal, reliability and redundancy, and reservoir operation.

Purified water treatment is projected to be highly efficient in removing phosphorus, but less efficient in removing nitrogen. As a result, phosphorus is projected to be the nutrient that limits the potential for biostimulation in purified waters. In reservoirs where phosphorus loads can be controlled by reservoir operators (e.g. reservoirs that are overwhelmingly comprised of purified or imported water), reservoir operators will be able to control the potential for biostimulation by sustaining phosphorus-limited conditions in the reservoir.

To comply with the Basin Plan objective for biostimulatory substances, the Regional Water Board shall establish the following NPDES concentration limits for potable reuse/reservoir augmentation discharges to water supply reservoirs:

(1) concentration limits for total phosphorus that implement the Basin Plan numerical water quality objective for phosphorus in standing waters (e.g., 0.025 mg/l), and

(2) concentration limits for total nitrogen that are reflective of proposed reservoir management operations, site-specific reservoir N:P loads, and projected sustainable limited nutrient conditions. For example, if reservoir operators can document reservoir management actions that achieve sustained phosphorus-limited conditions where N:P ratios exceed 80:1, NPDES concentration limits for total nitrogen may be established at 2 mg/l (a factor of 80 above the 0.025 phosphorus Basin Plan objective for standing waters).

NPDES permits regulating potable reuse/reservoir augmentation projects shall also include a comprehensive program for physical and biological monitoring in the reservoir to document compliance with the Basin Plan biostimulatory objective.

4. Within Chapter 4 (Implementation), change the title of the section entitled "Implementation of Ground Water Quality Objectives for Reclaimed Water Discharges" from mixed case to upper case, to reflect the fact that this section should be a subsection under the main subchapter heading

"Reclaimed Water Conformance with Water Quality Objectives", and not part of the "Discharges to Inland Surface Waters" subsection.

Benefits of Implementing the Recommended Basin Plan Modifications. The proposed clarifications to the Basin Plan nitrogen objective nutrient will encourage implementation of potable reuse projects by providing clarity on how NPDES concentration standards are to be implemented for regulating nitrogen and phosphorus in reservoir augmentation discharges. Such implementation of potable reuse will:

- help implement the sustainable local supply element of the 2013 San Diego Water Board Practical Vision,
- help implement statewide recycled water use goals established in the State Water Board Recycled Water Policy,
- reduce wastewater discharges to the ocean, and
- reduce salinity loads in irrigated potable waters and irrigated recycled waters, thus improving compliance with Basin Plan ground and surface water quality objectives, compliance with storm runoff goals, and compliance with applicable Salt and Nutrient Management Plans.

The clarifications will also ensure that achievable nitrogen concentration limits can be established for potable reuse projects, and will allow reservoir N:P ratios to be managed and sustained by water agencies at levels that prevent biostimulation.

IV. THERMAL STRATIFICATION IN RESERVOIRS

Overview. The Basin Plan assigns a WARM (warm water habitat) beneficial use to every San Diego Region reservoir, and assigns a COLD (cold water habitat) beneficial use designation to most of the region's reservoirs. The Basin Plan also establishes a 5.0 mg/l dissolved oxygen (DO) concentration objective for all fresh waters designated with WARM beneficial use, and a 6.0 mg/l DO objective in waters designated as COLD. Furthermore, the Basin Plan establishes iron and manganese objectives of 0.3 mg/l and 0.05 mg/l which apply to all municipal supply reservoirs.

Most San Diego Region reservoirs are sufficiently deep to thermally stratify during spring, summer and fall months. Under thermally stratified conditions, waters in the upper portion of the reservoir (epilimnion) are physically separated from waters in the lower portion of the reservoir (hypolimnion) by a thermocline. Once the thermocline forms in the spring, epilimnion waters remain oxygenated from the atmosphere, but waters of the hypolimnion are seasonally cut off from any natural oxygenation source from the atmosphere. As a result, once the thermocline forms in the spring, DO concentrations in the hypolimnion naturally decrease toward zero until the thermocline disappears in late fall and the reservoir becomes fully mixed (reservoir turnover) and oxygenated throughout the water column.

During such seasonal thermally stratified conditions, it should be noted that fish can move back and forth across the thermocline to seek desired DO or temperature conditions.

Thermally stratified conditions within reservoirs can also influence reservoir concentrations of iron and manganese. Naturally-occurring anaerobic conditions within the hypolimnion can cause bottom sediments to release manganese and iron into the hypolimnion, resulting in natural seasonal fluctuations in which iron and manganese concentrations in these deeper thermally-stratified waters can exceed the secondary drinking water standards of 0.3 mg/l for iron and 0.05 mg/l for manganese. These naturally-occurring seasonal variations in iron and manganese within the hypolimnion require increased attention on the part of water system operators. Reservoir operators seasonally adjust water blends and the depths at which water is withdrawn from the reservoir to improve the treatability of the withdrawn water and to ensure that the final treated potable supply complies with secondary drinking water standards for iron and manganese.

Potential Problems with Existing Basin Plan Requirement. The Basin Plan DO objectives are inconsistent with naturally-occurring seasonal phenomena that occur within the hypolimnions of thermally-stratified reservoirs, and the existing DO concentration limit cannot be met within hypolimnetic waters under natural summer and fall thermally-stratified conditions. Additionally, the Basin Plan is inconsistent with naturally-occurring variations in reservoir iron and manganese concentrations that result from thermal stratification.

Reservoir owners and operators are concerned that such naturally-occurring seasonal decreases in hypolimnion dissolved oxygen concentrations and increases in hypolimnion iron and manganese concentrations will result in every thermally-stratified reservoir within the San Diego Region being listed as 303(d) impaired. Water agencies and reservoir operators are also concerned that this inconsistency may constrain implementation of potable reuse projects or may result in enforcement actions against potable reuse projects once mandated receiving water monitoring data demonstrate the existence of these naturally-occurring seasonal reductions in hypolimnetic DO and increases in hypolimnetic concentrations of iron and manganese.

Proposed Revisions. Revise the Basin Plan Dissolved Oxygen Objective (page 3-25) as follows:

Water Quality Objective for Dissolved Oxygen

Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses, or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time. These dissolved oxygen concentration objectives shall not apply within the hypolimnions (e.g., waters below the thermocline) of thermally stratified reservoirs, as naturally-occurring, seasonal thermally-stratified conditions prevent the atmosphere from oxygenating hypolimnetic waters during such periods of stratification.

Water Quality Objective for Iron

Inland surface waters shall not contain iron in concentrations in excess of the numerical objectives described in Table 3-2. This iron concentration objective shall not apply during reservoir destratification (turnover) events, or within the hypolimnions (e.g., waters below the thermocline) of

thermally stratified reservoirs, as naturally-occurring, seasonal thermally-stratified conditions cause a reduction in hypolimnetic dissolved oxygen which allows iron to be naturally released into the hypolimnion from bottom sediments.

Water Quality Objective for Manganese

Inland surface waters shall not contain manganese in concentrations in excess of the numerical objectives described in Table 3-2. This manganese concentration objective shall not apply during reservoir destratification (turnover) events or within the hypolimnions (e.g., waters below the thermocline) of thermally stratified reservoirs, as naturally-occurring, seasonal thermally-stratified conditions cause a reduction in hypolimnetic dissolved oxygen which allows manganese to be naturally released into the hypolimnion from bottom sediments.

Benefits of Implementing the Recommended Basin Plan Modifications. The proposed clarifications to the Basin Plan DO, iron, and manganese objectives will acknowledge the occurrence of natural seasonal decreases in hypolimnion DO concentrations and increases in hypolimnion iron and manganese concentrations, and will prevent the need to list every thermally-stratified reservoir within the San Diego Region as 303(d) impaired. The proposed DO, iron, and manganese clarifications will also ensure that reservoir operators or agencies implementing potable reuse projects are not penalized or adversely impacted when reservoir data are presented to the Regional Water Board that demonstrate the occurrence of these natural seasonal reductions in hypolimnetic DO or increases in hypolimnetic iron and manganese.