

Appendix 2: Draft Substitute Environmental Document

Table of Contents

Appendix 2: Draft Substitute Environmental Document.....	1
1.1. Approvals, Environmental Review, and Consultation Requirements	3
1.1.1. Purpose of the Substitute Environmental Document (SED)	3
1.1.2. California Environmental Quality Act (CEQA)	4
1.1.3. Early Public Consultation.....	5
1.1.4. Compliance with Assembly Bill 52 (AB 52)	6
1.1.5. Scientific Peer Review	7
1.1.6. Water Code Section 13241.....	7
1.1.7. Approvals Process.....	7
1.2. Introduction/Description of Proposed Action.....	8
1.3. Environmental Setting and Rationale for the Project	9
1.3.1. Project Location and Surrounding Land Uses.....	9
1.3.2. Biological Condition of Waters in the San Diego Region.....	12
1.3.3. Rationale for Amending the Basin Plan	13
1.4. Reasonably Foreseeable Methods of Compliance	14
1.4.1. Modification/Addition of Receiving Water Monitoring and Assessment	17
1.4.2. Storm Water Best Management Practices (BMPs)	18
1.4.3. Traditional Non-Storm Water Source Controls.....	21
1.4.4. Waste Discharge Requirements	22
1.4.5. In-stream Restoration	23
1.5. Environmental Effects of Biological Objectives.....	26
1.5.1. Introduction	26
1.5.2. Impact Methodology	27
1.5.3. Level of Analysis	28
1.5.4. Environmental Impacts (Checklist)	30
1.5.5. Significant or Potentially Significant Impacts of the Proposed Project.....	96
1.6. Analysis of Reasonably Foreseeable Environmental Impacts Associated with the Methods of Compliance	97
1.7. Cumulative Impacts Analysis	97
1.7.1. Water Board Program-specific Cumulative Impacts Analysis.....	99

- 1.7.2. Project-Specific Cumulative Impact Analysis 105
- 1.8. Alternatives Analysis 107
 - 1.8.1. No Project Alternative 108
 - 1.8.2. State Water Board Alternative 109
 - 1.8.3. Biological Targets Alternative 109
 - 1.8.4. Antidegradation-Only Alternative 110
 - 1.8.5. Tiered Aquatic Life Use (TALU) or Biological Condition Gradient (BCG) Alternative 110
 - 1.8.6. Analysis of Project Alternatives 111
- 1.9. Water Code Sections 13241, 13242, and Antidegradation 112
 - 1.9.1. California Water Code 13241 112
 - 1.9.2. Water Code 13242 131
 - 1.9.3. Antidegradation Analysis 131
- 1.10. References 133

1.1. Approvals, Environmental Review, and Consultation Requirements

1.1.1. Purpose of the Substitute Environmental Document (SED)

The amendment of Water Quality Control Plans (including Basin Plans) has been certified by the Secretary for Resources as a “Certified Program” that meets Section 21080.5 of the Public Resources Code (California Code of Regulations (CCR), tit. 14, § 15251). Certified regulatory programs are provided an exemption from preparation of a CEQA document. However, the agency must still comply with CEQA goals and policies, including the analysis of impacts in a substitute environmental document, public participation, and adoption of findings (see below, CCR, tit. 14, § 15250).

The State Water Board’s CEQA implementation regulations describe the environmental documents required for Basin Plan amendment actions (CCR, tit. 23, § 3720 et seq. “Implementation of the Environmental Quality Act of 1970.”). Pursuant to California Code of Regulations title 23 section 3777, any water quality control plan, State policy for water quality control, and any other components of California’s water quality management plan as defined in Code of Federal Regulations, title 40 sections 130.2(k) and 130.6, proposed for board approval or adoption must include or be accompanied by a Substitute Environmental Document and supported by substantial evidence in the administrative record.

This SED was prepared by the San Diego Water Board for Basin Plan amendments in accordance with the Water Board’s certified regulatory program (CCR, tit. 23, § 3777 to 3781). As required by regulations, the SED includes an environmental analysis of the project, a completed environmental checklist, and other documentation required by law. The SED prepared for the Basin Plan amendment only assesses environmental impacts from the proposed action to amend the Basin Plan to incorporate narrative guidance for developing numeric biological objectives and a specific numeric Biological Objective for perennial and seasonal streams (hereinafter referred to as “Biological Objectives” or the “Stream Biological Objective”).

Additional corrections and minor clarifications to the Basin Plan may be included during this amendment. Note that any non-substantive non-regulatory changes to the Basin Plan in this amendment are not subject to environmental review under CEQA because they will have no effect on the environment. Therefore, no environmental analysis of the non-substantive changes is required. The Water Board will include findings related to any non-substantive changes proposed in the Basin Plan amendment.

The purpose of this SED is to present the San Diego Water Board’s analysis of the need for and the effects of the proposed Basin Plan amendment and to meet the State Water Board’s environmental review requirements. This SED presents an analysis of the potential direct and indirect impacts of the adoption of the proposed Basin Plan amendment on the environment, and other information relevant to the proposed Basin Plan amendment. For the purposes of this SED, the proposed Basin Plan amendment is also referred to as the proposed project. This SED also serves as a written portion of the Staff Report.

1.1.2. California Environmental Quality Act (CEQA)

CEQA authorizes the Secretary for Natural Resources to certify that state regulatory programs meeting certain environmental standards are exempt from many of the procedural requirements of CEQA, including the preparation of a separate Environmental Impact Report (EIR), negative declaration, or initial study. (Public Resources Code (PRC), § 21080.5.) The Secretary for Natural Resources has certified as exempt the State and Regional Water Board Basin Planning Program for the protection, maintenance, and enhancement of water quality in California (CCR, tit. 14, § 15251(g).) Exempt regulatory programs include the Water Boards’ adoption or approval of water quality standards and provisions to implement water quality standards, such as the amendment of the San Diego Water Board Basin Plan to incorporate Biological Objectives (CCR, tit. 23, § 3775-3781.) Therefore, the Staff Report includes the SED required for compliance with CEQA, and a separate CEQA document will not be prepared. The San Diego Water Board must still comply with CEQA’s goals and policies, including the policy of avoiding significant adverse effects on the environment where feasible. (CCR, tit. 14, § 15250.)

According to the State Water Board regulations for the implementation of CEQA (CCR, tit. 23, § 3777), the SED shall consist of a written report prepared for the board containing an environmental analysis of the project; a completed environmental checklist (where the issues identified in the checklist must be evaluated in the checklist or elsewhere in the SED); and other documentation as the board may include. The SED is required to contain, at a minimum, the following information:

- 1) A brief description of the project;
- 2) An identification of any significant or potentially significant adverse environmental impacts of the proposed project;
- 3) An analysis of reasonable alternatives to the project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts; and
- 4) An environmental analysis of the reasonably foreseeable methods of compliance. The environmental analysis shall include, at a minimum, all of the following:
 - a. An identification of the reasonably foreseeable methods of compliance with the project;
 - b. An analysis of any reasonably foreseeable significant adverse environmental impacts associated with those methods of compliance;
 - c. An analysis of reasonably foreseeable alternative methods of compliance that would have less significant adverse environmental impacts; and

- d. An analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable significant adverse environmental impacts of the reasonably foreseeable methods of compliance. (CCR, tit. 23, § 3777, subd.(b)).

These analyses are contained in the SED portion of this Staff Report and within prior portions of the Staff Report as referenced.

1.1.3. Early Public Consultation

CEQA requires the San Diego Water Board to seek early public consultation with public agencies and members of the public prior to circulating the draft SED. (CCR, tit. 23, § 3775.5, subd.(a)). The consultation may include one or more scoping meetings to engage the stakeholders and public agencies early in the planning and formulation stages of the project to scope the range of actions, alternatives, reasonably foreseeable methods of compliance, significant impacts, and cumulative impacts, if any, that should be analyzed in the study and mitigation measures that will reduce impacts to a less than significant level, and to eliminate from the project any elements found not to be important (CCR, tit. 23, § 3775.5, subd. (b)).

A CEQA scoping meeting for Biological Objectives was held on July 28, 2016, in San Diego, California. Oral and written comments received during the scoping meeting, and written comments received for a set period thereafter, were considered. CEQA scoping was conducted to seek input from public agencies and members of the public of the range of project actions, alternatives, reasonable foreseeable methods of compliance, significant impacts to be analyzed, cumulative impacts if any, and mitigation measures. Notices and materials for these meetings are available at:

http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/bio_objectives/index.shtml.

In addition to the CEQA scoping meeting, early public consultation considered included oral and written comments received on the inclusion of Biological Objectives in the San Diego Water Board Basin Plan Review. The 2014 Basin Plan Triennial Review staff proposal included Biological Objectives as a Tier I Project. Biological Objectives in the Triennial Review process required public review. The San Diego Water Board received comments orally and in writing as part of the public hearing process, which included a written comment period from December 8, 2014, to January 23, 2015. In addition, a public workshop was held on January 8, 2015, at which oral comments on Biological Objectives were received.

1.1.4. Compliance with Assembly Bill 52 (AB 52)

AB 52 (Gatto, 2014) established a new category of resources in CEQA called Tribal Cultural Resources:

‘Tribal cultural resources’ are either of the following: (1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following: (A) Included or determined to be eligible for inclusion in the California Register of Historical Resources. (B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1. (2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe. (PRC, § 21074.)

AB 52 also established a consultation process with all California tribes on the Native American Heritage Commission List. Consultation with a California Native American tribe that has requested such consultation may assist a lead agency in determining whether the project may adversely affect tribal cultural resources, and if so, how such effects may be avoided or mitigated. AB 52 requires formal notice to California tribes of an opportunity to consult with the lead agency prior to the release of a negative declaration, mitigated negative declaration, or EIR if the tribe is traditionally and culturally affiliated with the geographic area of the proposed project.

The requirements to consider tribal cultural resources and to consult with California tribes apply to CEQA projects for which the lead agency issues a notice of preparation or a notice of intent to adopt a negative declaration or mitigated negative declaration on or after July 1, 2015. The San Diego Water Board considers AB 52’s requirements as also applying to preparation of an SED.

The San Diego Water Board sent letters (dated June 20, 2016) via certified mail to tribal communities within the San Diego Region, including all of the California tribes registered at the time to receive AB 52 notices for projects within San Diego Water Board boundaries. The San Diego Water Board received no responses to the letters requesting consultation within the 30 days (or at any other time) following the tribes’ receipt of the letters. The San Diego Water Board also contacted a tribal representative who attended and provided oral comments on Biological Objectives during a Basin Plan Triennial Review public meeting. In response to the inquiry, the tribe did not wish for consultation.

1.1.5. Scientific Peer Review

In 1997, section 57004 was added to the California Health and Safety Code (Senate Bill 1320-Sher) which requires external scientific peer review of the scientific basis for any rule proposed by any board, office or department within California Environmental Protection Agency (CalEPA). Scientific peer review is a mechanism for ensuring that regulatory decisions and initiatives are based on sound science. Scientific peer review also helps strengthen regulatory activities, establishes credibility with stakeholders, and ensures that public resources are managed effectively. The scientific and technical information that support Biological Objectives will go through the peer review process during the public review period for the project, and peer review documents will be posted on-line at https://www.waterboards.ca.gov/water_issues/programs/peer_review/

1.1.6. Water Code Section 13241

In accordance with Water Code section 13241, the Water Boards are required to establish water quality objectives to “ensure the reasonable protection of beneficial uses and the prevention of nuisance.” In doing so, the Water Boards shall consider the following factors:

- 1) Past, present, and probable future beneficial uses of water.
- 2) Environmental characteristics and water quality of the hydrographic unit under consideration.
- 3) Water quality conditions that could be reasonably attained through coordinated control of all factors affecting water quality.
- 4) Economic considerations.
- 5) The need for developing new housing.
- 6) The need to develop and use recycled water.

Discussion of the six factors are included within Section 1.9 of the SED.

1.1.7. Approvals Process

After adoption by the San Diego Water Board, Biological Objectives must be submitted to the State Water Board for review and approval, followed by submittal to the California Office of Administrative Law for review and approval. Because Biological Objectives include the adoption of new water quality standards, they must be submitted to USEPA for review and approval pursuant to the Federal Water Pollution Control Act Amendments of 1972, as amended (33 U.S.C. § 1251 et seq., also known as the Clean Water Act), section 303, subdivision (c).

Except as may be required by other environmental review and consultation requirements as described below, no other agency approvals are expected to be required to implement Biological Objectives. Beyond analyzing the reasonably foreseeable methods of compliance, the Staff Report is not required to, and therefore does not analyze, the details related to the project-specific actions that might be implemented by any particular permittee as a result of the San Diego Water Board’s project. (see CCR, tit. 23, § 3777, subd. (c); PRC § 21159, subd. (d).)

1.2. Introduction/Description of Proposed Action

The Basin Plan designates beneficial uses of waterbodies, establishes water quality objectives for the protection of these beneficial uses, and outlines a plan of implementation for maintaining and enhancing water quality within the San Diego Region as defined in CWC §13200. The San Diego Water Board is proposing to amend the Basin Plan. The Basin Plan amendment makes the following changes to the Basin Plan:

- Revises Chapter 3 to include a numeric biological water quality objective specific to perennial and seasonal streams.
- Revises Chapter 4 to include a framework for implementation of Biological Objectives.
- Revises Chapter 4 to include narrative guidance for the development of numeric water quality objectives for the protection of biological communities associated with beneficial uses protecting aquatic organisms and aquatic-dependent wildlife.
- Makes non-substantive changes to the Basin Plan to make it up to date and correct typographical errors.

The Basin Plan amendment implements the San Diego Water Board's Practical Vision (San Diego Water Board 2013) in multiple ways. The Basin Plan, along with statewide Water Quality Control Plans adopted by the State Water Board, provides the foundation for all of the San Diego Water Board's regulatory actions. Inclusion of Biological Objectives in the Basin Plan highlights the importance of beneficial uses associated with aquatic and aquatic-dependent wildlife. The amendment of the Basin Plan to include Biological Objectives addresses three chapters of the San Diego Water Board's Practical Vision. These include:

- Strategizing for Healthy Waters
- Monitoring and Assessment
- Recovery of Stream, Wetlands, and Riparian Systems

The Basin Plan amendment process is a public process that begins with the Triennial Review of the Basin Plan, in which staff and the public propose and comment on potential Basin Plan amendment projects. The Board, after considering public comments and holding a hearing, approves a Resolution that directs staff to begin evaluating specific Basin Plan amendments. The San Diego Water Board holds public meetings on the proposed amendment, receives comments and input from the public, provides responses to comments received, and considers oral testimony at a public hearing. The Basin Plan amendment process is in line with goals outlined in the Practical Vision to maintain a proactive outreach and communication program that provides the public with user-friendly access to information.

1.3. Environmental Setting and Rationale for the Project

Section 15125(a) of the CEQA Guidelines states: “An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or ... at the time environmental review is commenced.... *This environmental setting will normally constitute the baseline physical conditions by which a Lead Agency determines whether an impact is significant*” (emphasis added).

The San Diego Region is defined in CWC section 13200 and includes 11 distinct hydrologic units and the Pacific Ocean. Additional descriptions for individual hydrologic units are found in Chapter 1 of the San Diego Water Board Basin Plan. As such, the environmental setting for determining impacts is presented at a general level as each permittee may address Biological Objectives with a range of methods and controls. Further discussion of the project environmental setting is included below.

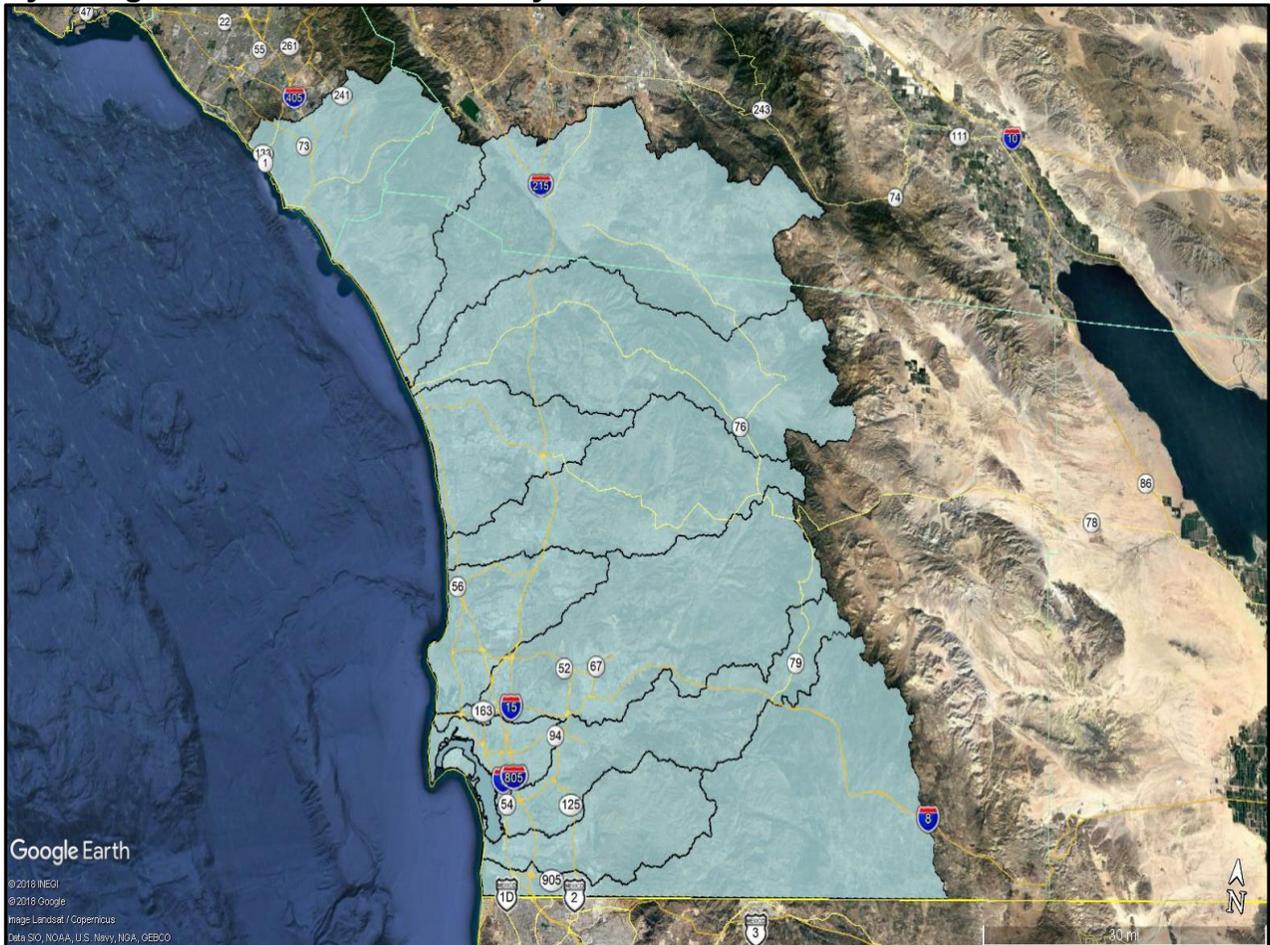
1.3.1. Project Location and Surrounding Land Uses

The San Diego Region forms the southwest corner of California and occupies approximately 3,900 square miles (Figure 1). The western boundary of the Region consists of the Pacific Ocean coastline. The northern boundary of the Region is formed by the hydrologic divide starting near Laguna Beach and extending inland through El Toro and easterly along the ridge of the Elsinore Mountains into the Cleveland National Forest. The eastern boundary of the Region is formed by the Laguna Mountains and other lesser known mountains located in the Cleveland National Forest. The southern boundary of the Region is formed by the United States-Mexico international border.

The San Diego Region encompasses most of San Diego County, parts of southwestern Riverside County, and southwestern Orange County. The Region is divided into a coastal plain area, a central mountain-valley area, and an eastern mountain-valley area. It consists of eleven hydrologic units that ultimately drain to the Pacific Ocean. The climate in the Region is generally mild with annual temperatures averaging around 65 °F near the coastal areas. Average annual rainfall ranges from 9 to 11 inches along the coast to more than 30 inches in the eastern mountains. There are two distinct seasons in the Region. Summer dry weather occurs from late April to mid-October. During this period almost no rain falls in the Region, except for sporadic highly localized tropical storms. The winter season (mid-October through early April) consists of generally dry weather interspersed with occasional rain storms. Eighty-five to 90 percent of the annual rainfall occurs during the winter season. Streams within the Region are predominantly seasonal and fed by springs and rainfall, as little snow falls throughout the region, except at the highest elevations, and snowfall accumulation does not occur on a seasonal basis.

The land use of the San Diego Region is highly variable. The western coastline areas are highly developed with urban and residential land uses, and the inland areas primarily consist of open space. The predominant land uses in the Region are open space or recreational land use, followed by low-density residential and agriculture/livestock land uses. Other major land uses are commercial/institutional, high-density residential, industrial/transportation, military, and transitional.

Figure 1. Map of San Diego Region. The watersheds associated with the 11 Hydrologic Units are demarcated by lines.

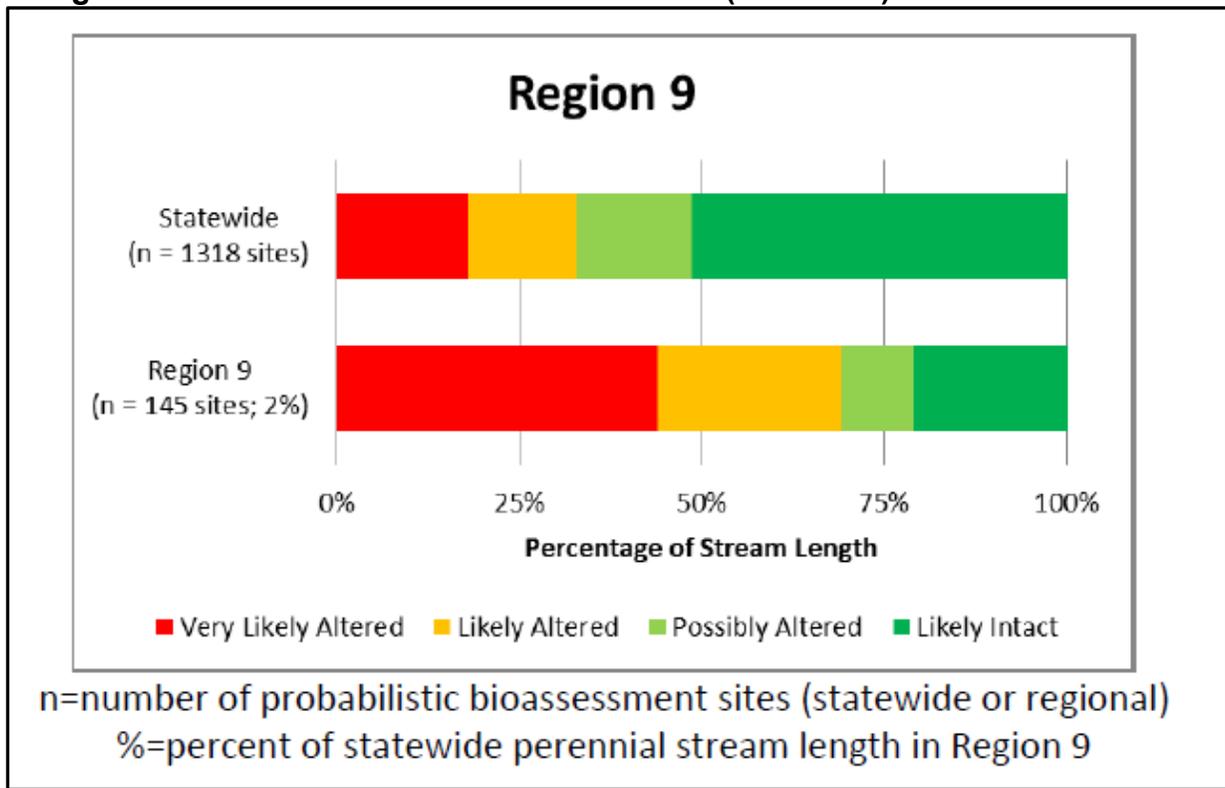


1.3.2. Biological Condition of Waters in the San Diego Region

Surface waters in the San Diego Region include several types of coastal waters including bays, harbors, estuaries, beaches, and the open ocean and a variety of inland waters with thirteen principal stream systems that flow into the Pacific Ocean. Multiple individual ecosystem types are present and interconnected within surface waters in the San Diego Region. Varying metrics have been developed that directly and indirectly assess ecosystem-based Beneficial Use quality based on sensitive indicator species, chemistry, toxicity, community composition, habitat quality/quantity, and other ecological metrics.

While standardized methods for assessing ecosystem integrity are lacking for many waterbody/habitat types, perennial and seasonal streams in the San Diego Region have been sampled and scored in accordance with State of California Standard Operating Procedures beginning as early as the 1990s. More recent probabilistic sampling of perennial and seasonal streams for benthic macroinvertebrates in the San Diego Region indicates that almost 30 percent of stream-miles within the San Diego Region are in good condition when compared to equivalent reference sites using the California Stream Condition Index (“CSCI”, SMC 2015, PSA 2016, Figure 2). Additional standardized methods and metrics are currently under development to better assess other ecosystems.

Figure 2. Condition of Perennial and Seasonal Streams in the San Diego Region using Benthic Macroinvertebrates CSCI scores (PSA 2016)



1.3.3. Rationale for Amending the Basin Plan

The San Diego Water Board Basin Plan includes beneficial uses for waterbodies to protect uses of water for human health and the environment. Of the 23 designated beneficial uses within the Basin Plan, 10 beneficial uses directly relate to the protection of biological condition of waters, commonly referred to as “aquatic-life” beneficial uses that protect ecosystem condition. To protect beneficial uses, including those for aquatic life, water quality objectives are established in the Basin Plan. Almost all existing water quality objectives to protect aquatic-life beneficial uses are chemistry-based and use individual chemical limits or levels as a proxy to protect aquatic life.

Use of water chemistry alone in waterbody assessment does not adequately protect the biological integrity of waters due to the necessarily constrained temporal and spatial extent of chemical monitoring, the limited number of chemicals and matrices that can feasibly be monitored, cumulative and synergistic effects, sublethal effects, and the inability of chemistry-based assessment to detect impairment caused by pollution and not a pollutant (e.g. habitat modification, USEPA 1991, 2002, 2015).

In contrast, biological assessment, or bioassessment, is the science of evaluating the integrity of waters by assessing the organisms that live within it, which is a better representation of aquatic-life beneficial uses. Biological objectives are water quality objectives that use bioassessment to set actual levels for direct beneficial use condition.

Biological objectives are needed, in tandem with chemistry-based water quality objectives and physical assessment, to protect and restore the beneficial uses associated with ecosystem condition. For those waterbodies with a designated beneficial use(s) associated with the protection of aquatic ecosystems, chemistry-based water quality objectives alone do not protect the most sensitive beneficial use, nor do they provide accurate assessments of waterbody condition.

Unlike traditional chemistry-based monitoring, which provides only limited information about a relatively narrow portion of the environment at a discrete point in time, bioassessment can account for living organisms exposed to multiple chemicals and other stressors (such as altered habitats and changes in water-flow patterns) over extended time periods. Consequently, bioassessment has the potential to provide a more integrated reflection of the condition of an aquatic ecosystem; bioassessment also is more closely tied to environmental managers’ end-goal focus on ecosystem protection and serves as an important way to monitor and protect the populations of endangered species and fisheries.

1.4. Reasonably Foreseeable Methods of Compliance

This section identifies a range of reasonably foreseeable method(s) of compliance with the Basin Plan amendment. The San Diego Water Board's SED for the proposed project is required to include an analysis of the reasonably foreseeable methods of compliance with the project. (CCR, tit. 23, § 3777; PRC § 21159). In developing the environmental analysis, the San Diego Water Board is not required to conduct a site-specific project level analysis of the methods of compliance, but the environmental analysis shall account for a reasonable range of environmental, economic, and technical factors. (CCR, tit. 23, § 3777, subd. (c); PRC, § 21159, subd. (d)).

Adoption of Biological Objectives will not cause any change in the type of compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat. Compliance methods to address pollutant discharges and restore stream habitat are already required by the San Diego Water Board, and thus any potential impacts have occurred or will occur under existing water quality criteria. This baseline compliance condition will not change with the adoption of Biological Objectives. However, Biological Objectives are expected to provide clarity in the implementation of compliance measures to meet existing Beneficial Uses by providing the information to focus on specific pollutants causing impacts to beneficial uses, as well as incorporating considerations of site-specific habitat conditions. This is expected to better focus existing compliance measures, thus reducing potential impacts associated with the present implementation of unnecessary compliance measures.

Reasonably foreseeable methods to comply with regulations associated with the Basin Plan amendment include:

1. Monitoring and assessment of biological condition, including stream invertebrates, stream algae, riparian habitat, and water chemistry / toxicity.
2. Measures to reduce the adverse characteristics of waste discharges to streams with aquatic life beneficial uses, such as pollutant and flow control measures.
3. Measures to correct physical impairments of Biological Objectives in streams, including in-stream enforcement or restoration activities.

Note, however, that these actions would likely occur in the absence of the Biological Objectives Basin Plan amendment because of existing regulations to protect aquatic life beneficial uses. Many entities are required to conduct biological monitoring, but the Basin Plan amendment will increase the certainty of biological monitoring and assessment requirements including protocols to minimize adverse effects. And, the San Diego Water Board currently requires regulated entities to implement pollutant control measures and/or cleanup/restoration measures to protect aquatic life beneficial uses. The increased use of biological condition monitoring will inform better, and ultimately more efficient, selection of measures for pollutant control, enforcement, and restoration measures.

The incorporation of Biological Objectives is not expected to significantly change the reasonably foreseeable methods of compliance already required under existing regulatory permitting programs. As specified in the Implementation Section (Section 5), the Stream Biological Objective will be incorporated a receiving water limit within the framework of existing permits, many of which already require biological monitoring including stream bioassessment.

The possible environmental effects that could be caused by compliance methods are presented in this SED. Outside of permit-required monitoring, the actual compliance strategies and methods will be selected by local agencies and other permittees because the San Diego Water Board is generally prohibited from specifying the manner of compliance with pollution control requirements (CWC § 13360). As the compliance strategies are implemented locally they will at that time require a site specific environmental analysis. The reasonably foreseeable methods of compliance for Biological Objectives include additional monitoring and assessment requirements for dischargers, updated Best Management Practice and/or source controls consistent with existing permit requirements, and stream habitat restoration.

The most reasonably foreseeable method of compliance associated with the amendment is additional monitoring and assessment activities resulting from requirements for new and existing dischargers to evaluate compliance with or effect on Biological Objectives. For those discharges that cause or contribute to an exceedance of numeric Biological Objectives, compliance will mirror existing regulatory requirements. This includes assessment of the observed degradation relative to the discharge, which would be addressed via existing regulatory program requirements, such as implementing focused BMPs or source controls to address the pollutant(s) of concern. The San Diego Water Board has included analysis of implementation of BMPs and source control measures in this SED although these are already requirements under existing permits and regulatory authorities.

This compliance process will also provide clarity on non-discharge related sources that impact Biological Objectives, such as habitat modification, which may be addressed via other mechanisms, such as grants. The Basin Plan amendment does not change existing compliance measures in regulatory programs (see Section 5 of the Staff Report), and is expected to reduce costs associated with inaccurate and incomplete program activities inaccurately assumed to be degrading Beneficial Uses (see section D). This focus on biological endpoints to determine Beneficial Use attainment may reduce environmental impacts associated with on-going regulatory program activities.

Biological Objectives may result in the direction of resources to in-stream physical habitat restoration as a result of enforcement actions, voluntary permit actions, and non-regulatory actions. While in-stream habitat restoration activity is considered a reasonably foreseeable method of compliance, the San Diego Water Board has statutory responsibility to regulate in-stream restoration activities to ensure significant adverse impacts will not occur, and such restoration activities are typically intended to protect and restore multiple beneficial uses, including those not directly related to aquatic life. Regulated entities and other organizations (e.g. NGOs) may choose to undertake such activities to restore Beneficial Uses, and already do so within the San Diego Region. These actual activities vary widely in project scope, magnitude, duration, and methods. While a general discussion has been included for reference purposes, such projects are implemented locally and will, at that time, require a site-specific environmental analysis.

Table 1. Reasonably Foreseeable Compliance Measures

Category	Possible Actions	Environmental Change Subject to Review
Modification/Addition of Receiving Water Monitoring and Assessment	Increased receiving water monitoring events or types, including collection of biological organisms, sediment, and water.	Access to waters and collection of organisms, sediment, and water
Storm Water BMPs	Focused Structural BMPs	Earthmoving, minor construction, and/or enhanced vegetation cover
Storm Water BMPs	Modify or Focused Non-Structural BMPs	Modify or focus maintenance, inspections, and/or public outreach efforts
Focused Source Control	Focused or revised treatment controls Alternative discharge methods	Earthmoving and/or minor construction
Enforcement: cleanup of unpermitted discharges to streams	Removal of inert materials or pollutants.	Earthmoving, minor construction, and/or enhanced vegetation cover
Stream Habitat Restoration	Perform Stream Habitat Restoration	Earthmoving, minor construction, modification, and/or enhancement of vegetation cover

Enforcement actions taken by the San Diego Water Board associated with violations of discharge prohibitions in the Basin Plan may occur to address impacts to Beneficial Uses, which would include Biological Objectives. However, it is not reasonable to foresee the magnitude, duration, scope, method, or causative agents associated with unknown violations of Basin Plan prohibitions, such as illegal discharges. Therefore, it is speculative to determine potential impacts and mitigation measures from enforcement actions that may or may not occur. Necessary environmental reviews will occur in such cases by the lead agency for the project. While in-stream habitat restoration activity may occur for enforcement purposes for unpermitted fill, the San Diego Water Board has statutory responsibility to regulate in-stream restoration activities to ensure significant impacts will not occur.

1.4.1. Modification/Addition of Receiving Water Monitoring and Assessment

Monitoring requirements in existing regulatory programs are required to ensure that a discharge(s) associated with a project(s), facilities, and/or land management activities do not cause or contribute to an exceedance of water quality standards. Monitoring requirements are included to protect all water quality standards, including those to protect human health (e.g. drinking water, water contact recreation) and the environment.

Compliance monitoring for regulatory purposes is described in detail in Section 5 of the Staff Report. In the San Diego Region, most permits (e.g., NPDES, WDRs for surface waters, 401 Certifications) currently include receiving water monitoring with some form of direct or indirect biological assessment (bioassessment). Bioassessment is an evaluation of the condition of a waterbody based on the organisms living within it, thus requiring direct surveying for the types and numbers of organisms present in the water and comparing the results to established benchmarks of biological health. Such monitoring typically occurs on an annual basis and multiple standard operating procedures are available for conducting various types of bioassessment in different habitat types, including for perennial and seasonal streams (e.g. NMFS 2014, Fetscher et al. 2015, Ode et al. 2016b, CWMW 2013). Bioassessment is currently used in existing regulatory monitoring programs and by other entities, such as state agencies and citizen science monitoring groups. Receiving water monitoring for streams also may include other physical and chemical parameters, such as individual pollutants, toxicity testing, in-stream habitat quality, and flow monitoring.

Assessment activities are also included in reasonably foreseeable methods of compliance, as dischargers to surface waters under the CWA and Porter-Cologne are required to assess both discharge and receiving water monitoring data in order to assess if a discharge(s) is causing or contributing to an exceedance of water quality standards that protect human health and the environment. This includes water quality standards in place to protect ecosystem beneficial uses of receiving waters. Assessment by regulatory programs is discussed in the implementation section (Section 5 of the Staff Report).

1.4.2. Storm Water Best Management Practices (BMPs)

Pollution from municipal, industrial, and construction storm water runoff is regulated through the NPDES Storm Water Program (See Staff Report Section 5). CWA section 402(p) requires pollutants in storm water discharges to be reduced using a combination of source control and, if necessary, treatment practices that are selected based consideration of the characteristics of the discharge and receiving water. Pollutants in municipal (MS4) storm water discharges must be reduced to the maximum extent practicable (MEP), while pollutants in industrial and construction storm water discharges must be reduced using the best available technology (BAT) and best control technology (BCT) standard. In general, permits are required for storm water from industries, construction activities, municipalities, and state and federal facilities. For such permits, BMPs are implemented in an iterative process that uses adaptive management. Compliance with Biological Objectives would require biological monitoring and assessment results inform the existing adaptive management iterative approach for BMPs. Many of the approaches for controlling storm water within these permits are listed below.

Structural BMPs

Structural BMPs involve the use of constructed systems to treat or divert water at either the point of generation or discharge to either the storm water system or to receiving waters. While the creation and operation of these systems can create temporary environmental impacts, their purpose is to perform long term reduction of pollutants through water capture and potential treatment. Installation of new structural BMPs can also co-occur with maintenance or repairs of existing infrastructure to reduce impacts. Examples of structural BMPs can be local or regional in scale and are briefly described below.

Local Capture and Reuse/Recharge Systems

These are often the simplest systems that contribute to the control of pollutants by reducing the volume of runoff and reducing peak flows. The BMPs within this system are designed to capture runoff from relatively clean surfaces, such as roofs, so that water can be used again without treatment. These systems may include containers as small as rain barrels, or they may include the construction of large cisterns, or other containers to hold large quantities of rainwater for reuse or recharge. The capacities of these local systems range from around 55 gallons to thousands of gallons and can be situated above or below ground.

Infiltration Systems

This general class of systems reduces pollutants from contaminated runoff through increased on-site infiltration. This method involves the use of alternative paving materials, retention grading, and/or infiltration basins or areas. The effectiveness of these infiltration systems is based primarily on the vegetation and soil characteristics. Specific BMPs include permeable paving systems such as pervious concrete, pervious asphalt, pervious paving blocks, grass pavers, and pervious crushed stone. Local infiltration systems can be effective for storm water management for areas ranging from individual lots to several city blocks. Infiltration basins/areas include soil and vegetation specifically designed to treat and reduce/remove pollutants and can be designed at scales to treat and infiltrate differing volumes of water.

Regional infiltration systems are generally large basins capable of detaining the entire volume of a design storm and infiltrating the volume over an extended period. Constructed wetlands and other regional biofiltration systems provide some flood mitigation and treatment of different pollutants. Water quality benefits are primarily accomplished by impounding water and allowing it to slowly percolate in surface soil and vegetation and eventually to groundwater. Use of these systems depends on the suitability of soils for infiltration and appropriately located space.

Media Filtration

These systems incorporate media filtration to control pollutants through pollutant removal via separation of fine particulates and associated pollutants, or through absorption (e.g. carbon). During the filtration process, storm water is captured and either directed by gravity or pumped through media such as sand, anthracite, compost, zeolite or combinations of natural and engineered substrates. Media filters can be integrated directly into existing on-site storm drain systems (e.g. catch basins, downspouts) or created as off-line facilities requiring a diversion structure.

Vegetated Treatment Systems

These systems reduce pollutants in storm water by using soils and vegetation to filter and treat storm water in a flow-through manner prior to discharge into surface or sub-surface waters. They work through a combination of biofiltration, retention, infiltration, and evapotranspiration to reduce the amount of runoff. BMPs within this category include bio-swales, filter strips, bioretention areas, storm water planters, and vegetation catch basin inserts. These can be installed on-site or in street medians, parking lots, or curb extensions.

Diversion and/or Treatment

A diversion and/or treatment BMP routes storm water runoff away from the storm drain system (and thus surface waters) and redirects the flow through into the sanitary sewer or other treatment system. There, the runoff receives pollutant treatment and filtration before being released with treated sanitary sewage effluent or reused through indirect potable reuse or as recycled water for industrial, agricultural, or landscaping application.

Non-structural BMPs

Non-structural BMPs are prevention practices designed to improve water quality through the inspection and maintenance of sites and facilities, repair of existing systems, and the development of control programs that focus on prevention, education, and regulation. These programs are described below.

Public Education and Outreach

Education and outreach to businesses and residents minimize the potential for contamination of storm water runoff by encouraging businesses and residents to practice best management practices, such as cleaning up after their pets, picking up litter, eliminating non-storm water discharges, and reducing pollutants in runoff from residential and commercial facilities.

Local agencies can provide educational materials to the public through television, radio, online and print media. These agencies can also create information for educators and schools, develop community events, and support volunteer monitoring and cleanup programs.

Repair of Aging Infrastructure

Aging sanitary and storm water infrastructure can be significant sources of pollution. They can cause pollution through sanitary sewer overflows caused by blockages, line breaks, cracks, and other sewer defects, exfiltration of sewage from sanitary sewers, and infiltration of groundwater. Upgrading, repairing, or slip-lining faulting sanitary sewer pipes will reduce pollution by eliminating the leaks in those pipes. Additionally, upgrading or repairing the storm drain pipes can minimize the infiltration of contaminated groundwater into the system.

Maintenance of Storm Water Systems and Structural BMPs

Maintenance activities are very important to keep storm water systems, including structural BMPs, working effectively. Storm drains and structural BMPs can accumulate trash, sediment, organic matter, invasive species, and animal waste over time. As a result, they can become secondary reservoirs for pollutants. Maintenance activities are typically done on a multi-year cycle and can be done more frequently in priority stream segments for pollutant reduction.

BMP Inspections of Sites and Facilities

Establishing and enforcing ordinances for commercial, industrial and multi-family facilities BMPs are necessary to insure BMPs are being implemented as required to reduce pollutants. These inspections (and enforcement activities) can include grease removal equipment for restaurants, monitoring trash enclosures, private structural BMP installation and maintenance inspections, cleaning private catch basins and drain inlets, and illicit discharge detection and elimination.

Improved Street Cleaning

This management measure involves employing paving cleaning practices such as street sweeping on a regular basis to minimize trash, sediment, debris and other pollutants that might end up contaminating receiving waters.

Storm Drain Stenciling

Storm drain inlet stenciling is a way to inform the public about the direct effects of discharging polluted runoff to storm drains and thus receiving waters.

1.4.3. Traditional Non-Storm Water Source Controls

Traditional point sources, such as wastewater treatment plants, have individual or general NPDES permits that regulate their discharges, with BMPs and/or effluent limits to insure discharges protect receiving waters. Dischargers use a wide variety of available technological BMPs and/or treatment methods to reduce pollutants to meet effluent limitations and protect receiving waters, which is confirmed through receiving water monitoring, if applicable. Specific BMPs and treatment technologies depend upon the nature of the discharge including type, magnitude, duration, and site-specific requirements. Examples are listed below.

BMPs: Alternative to Discharge

Traditional non-storm water NPDES permittees may be required to consider alternatives to their proposed discharge depending on its magnitude, duration, and pollutants of concern. The alternatives can include, but not be limited to, diversion of all or portions of the discharge to the sanitary sewer system, infiltration ponds, and/or treatment for beneficial re-use (e.g. irrigation, dust control, cooling). These BMPs reduce the pollutants entering surface waters and, in many cases, may result in the beneficial use and/or re-use of waters. Such practices may be especially beneficial particularly for use as a substitute where potable imported water is being used for non-consumptive purposes.

Treatment Methods

For discharges to surface waters, dischargers may be required to meet effluent limitations to insure water quality standards in receiving waters are protected. Various technological methods are used to treat effluent prior to discharge. For example, canister filtration can be used to remove total suspended solids from groundwater dewatering operations as a final treatment step to meet water quality standards for turbidity. Another example of multi-step treatment involves chlorination to address harmful bacteria. Chlorination is one method that can be used to eliminate harmful bacteria and other microorganisms in drinking water and sewage. Although chlorine is a cost-effective means of disinfection, chlorine residuals in water discharges has detrimental effects on aquatic life. Thus, every discharger that uses chlorine has the potential to cause acute toxicity and therefore a chlorination-dechlorination process must be used and maintained.

1.4.4. Waste Discharge Requirements

Waste Discharge Requirements (WDRs) impose conditions that protect water quality, implement the Water Quality Control Plan, and when the discharge is to waters of the United States, meet the requirements of the Clean Water Act. WDRs impose limits on the quality and quantity of waste discharges and specify conditions to be maintained in the receiving waters. All waste discharges, whether to land or water, are subject to Water Code section 13263. Most WDRs are permits for waste discharges to land that could primarily affect ground water quality and beneficial uses, and require treatment controls to protect beneficial uses. However, some WDRs regulate discharges to surface waters not covered under the CWA such as for irrigated agriculture.

Agricultural Activities

Agricultural BMPs for WDRs are developed to protect waters from discharges of waste by improving sediment and erosion management practices, preventing dry weather discharges of irrigation runoff, and improving storage, use, and runoff of fertilizers, pesticides, herbicides, and other chemicals used for agricultural purposes. The focus of these BMPs is usually on sediment runoff and associated nutrients, herbicides, and pesticides during storm events, as well as determining irrigation requirements and structural BMPs to prevent dry weather runoff. BMPs may be structural or non-structural and include, but are not limited to, inspection of irrigation system for breaks and leaks, proper application of chemicals on crops, proper storage of chemicals to prevent runoff during storm events, capture and re-use of irrigation water, and proper road grading.

Septic Systems and Other Onsite Wastewater Treatment Systems

Onsite wastewater treatment systems include a variety of on-site systems for the collections, storage, treatment, neutralization, or stabilization of sewage that occurs on a property. OWTSs include traditional septic systems, as well as other small on-site treatment systems. Poorly functioning systems can present a significant threat by discharging contaminated pollutants to surface waters and/or groundwaters. Proper management of OWTS at the local level can decrease this risk. Pollutants of concern include excess nutrients, bacteria, and pharmaceuticals and personal care products. Thus, poorly functioning systems impact multiple key beneficial uses, including for water contact, water consumption, and ecosystem integrity. For ecosystem integrity of surface waters, including Biological Objectives, local and state requirements (see below), include requirements to prevent impacts, including minimum treatment and siting requirements (e.g. setbacks from surface waters).

On June 19, 2012, the State Water Board adopted [Resolution No. 2012-0032](#), “The Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (OWTS Policy).” This Policy establishes a statewide, risk-based, tiered approach for the regulation and management of OWTS installations and replacements and sets the level of performance and protection expected from OWTS.

In accordance with Water Code section 13290 et seq., the OWTS Policy sets standards for systems that are constructed or replaced, that are subject to a major repair, that pool or discharge waste to the surface of the ground, and that have affected, or will affect, groundwater or surface water to a degree that makes it unfit for drinking water or other uses, or cause a health or other public nuisance condition. The OWTS Policy also includes minimum operating requirements for OWTS. These operating requirements may include siting and construction constraints. In addition, there may be specific requirements for OWTS near certain waters listed for nitrogen or pathogens as impaired under Clean Water Act section 303(d). These are requirements that will be in accordance with local TMDL implementation plans where applicable. The implementation of the OWTS Policy should help reduce the contribution of pollutants to surface waters from poorly operating systems.

1.4.5. In-stream Restoration

Biological Objectives may result in the direction of resources to in-stream physical habitat restoration as a result of enforcement actions, voluntary permit actions, and non-regulatory actions. While in-stream habitat restoration activity is considered a reasonably foreseeable method of compliance, the San Diego Water Board has statutory responsibility to regulate in-stream restoration activities to ensure significant impacts will not occur, and such restoration activities are typically intended to protect and restore multiple beneficial uses, including those not directly related to aquatic life. Regulated entities and other organizations (e.g. NGOs) may choose to undertake such activities to restore Beneficial Uses, and already do so within the San Diego Region. These actual activities vary widely in project scope, magnitude, duration, and methods.

Enforcement.

Biological Objectives may be used as part of the existing process for the cleanup of unpermitted discharges to streams. The San Diego Water Board's enforcement of unpermitted discharges of waste, including dredge and fill material, already occurs and would not be a new requirement. However, Biological Objectives would be included as a reasonably foreseeable method of compliance as they would provide clarity on actions needed to restore impacts that result from unpermitted discharges, and could be used to determine the success of already required mitigation measures to address those impacts.

Voluntary Actions

In some cases, for Biological Objectives to be achieved, in-stream habitat restoration will be conducted through the implementation of voluntary measures that are not regulatory in nature. In order for Beneficial Uses to be restored for streams throughout the San Diego Region above baseline condition, some streams will need to have in-stream habitat restoration to occur to provide the physical habitat conditions that support benthic macroinvertebrates. Many streams have had historical physical habitat alteration for the purposes of the protection of human health or property due to flooding associated with past land use development practices. These practices often focused on modifying stream hydrographs to transport water away from developed areas as quickly as possible. Thus, in some streams in-stream habitat restoration must occur at time scales commensurate with hydrologic improvement that supports physical habitat restoration. In-stream restoration involves the re-contouring, grading, planting of streams, as well as potential removal of channel modifications and hydrologic constrictions, such as concrete structures, improperly designed crossings, large trash and debris, and fencing.

In-stream restoration projects may also occur in existing Water Board grant programs and as Supplemental Environmental Projects. However, these projects are not required nor undertaken for the purposes of compliance with Biological Objectives, though improvements in water quality are expected to occur, including for Biological Objectives, and individual projects may use biological assessments. As such, a discussion of these activities is included within the SED. These projects will be subject to their own environmental review, the statutory regulatory authority of the Water Boards, and it is not reasonably foreseeable to estimate the magnitude, scope, timing, and duration of such projects at this time.

Voluntary Permit Actions

As described in Section 5, CWA 401 Certifications and WDRs for discharges of waste and/or fill to waters of the US and/or State are already required to conduct mitigation activities to ensure that impacts to Beneficial Uses associated with a project are restored to, at a minimum, pre-project condition. The incorporation of Biological Objectives will not result in any change in this requirement. CWA 401 Certifications already require biological monitoring, including bioassessment, to ensure that impacted Beneficial Uses are mitigated by restoring those impacted Beneficial Uses to pre-project condition or better. The inclusion of Biological Objectives and bioassessment monitoring may be used by permit applicants to guide their project development, including for the selection of waterbody avoidance, impact minimization, and mitigation activities. The proposal of mitigation sites and activities is not prescribed by the San Diego Water Board, and Biological Objectives may be used by project applicants to guide the selection of mitigation sites and measures, as well as documentation of success. This may include in-stream habitat restoration. In addition, entities may voluntarily choose to establish off-site areas, such as mitigation banks, to compensate for their own or others proposed activities. Mitigation banks may restore in-stream habitat for the purposes of providing mitigation credit for off-site impacts to beneficial uses. Biological Objectives may be used to guide bank selection and success, but such activities are not specifically required as a method of compliance with Biological Objectives.

Biological Objectives may also be used on a voluntary basis in Phase I municipal stormwater permitting should a permittee choose to proceed with the alternative compliance pathway for receiving water limitations under the permit. The alternative compliance pathway is not a mandatory requirement, but an option that allows permittee(s) to propose how they will set goals, implement programs, and measure compliance to meet receiving water limits. Alternative compliance may include voluntary in-stream habitat restoration should such actions be deemed suitable and feasible by the permittee(s) on a site-specific basis.

1.5. Environmental Effects of Biological Objectives

1.5.1. Introduction

In accordance with PRC, section 21080.5, subdivision (c)), the Water Boards' Water Quality Control/208 Planning Program has been certified as an exempt regulatory program by the Secretary for Natural Resources. (CCR, tit. 14, § 15251, subd. (g); *id.*, tit. 23, § 3775.) The certification means the Water Boards are exempt from having to develop an EIR because the environmental analysis is contained in the SED. Chapter 27 of the California Code of Regulations (beginning with section 3720) contains the Water Boards' regulations for implementing the CEQA (referred to as the certified regulatory program). (PRC, § 21000, et seq.) The Water Boards' certified regulatory program incorporates the CEQA Guidelines. (CCR, tit. 14, div. 6, ch. 3, section 15000.) The San Diego Water Board's SED must contain an environmental analysis of its proposed action. The Staff Report, which contains the SED, is being used to satisfy this requirement.

The Water Boards' certified regulatory program must still comply with CEQA's overall objectives to: inform the decision makers and the public about the potentially significant environmental effects of a proposed project; identify ways that significant adverse environmental impacts may be mitigated; and prevent significant, avoidable adverse environmental impacts by changing the proposed project or requiring mitigation measures. There are certain guiding principles that are contained in the CEQA Guidelines that help to inform the Water Board's certified regulatory process and preparation of the SED:

Forecasting: Drafting the environmental analysis necessarily involves some degree of forecasting. While foreseeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can. (CCR, tit. 14, § 15144.)

Speculation: If, after thorough investigation, a lead agency finds that a particular impact is too speculative for evaluation, the agency should note its conclusion and terminate discussion of the impact. (CCR, tit. 14, § 15145.)

Specificity: The degree of specificity required in the environmental analysis will correspond to the degree of specificity involved in the underlying activity which is described in the EIR. (CCR, tit. 14, § 15146.)

Standards for Adequacy: The environmental analysis should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency the analysis is to be reviewed in the light of what is reasonably feasible. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure. (CCR, tit. 14, § 15151.)

This section of the Staff Report identifies and evaluates the potential environmental impacts that may arise from Biological Objectives and the reasonably foreseeable methods of compliance, and contains the Environmental Checklist. It also discusses mitigation, where applicable, to avoid the identified significant or potentially significant impacts. (CCR, tit. 23, § 3777(b).)

1.5.2. Impact Methodology

This document does not address site specific impacts associated with individual projects as such impacts are addressed on an individual site-specific project basis whose environmental review is conducted by the lead CEQA agency (PRC § 21159.2.) This document has identified broad mitigation approaches that could be considered at the region-wide level. Consistent with PRC section 21159 and the Water Board certified regulatory program, the document does not engage in speculation or conjecture, but rather considers the potential environmental impacts of the Biological Objectives and reasonably foreseeable methods of compliance, the feasible mitigation measures, and feasible alternatives (including alternative means of compliance) which would meet the project objectives and avoid or reduce the potentially significant impacts.

Within each of the subsections discussed below, this document evaluates the potentially significant impacts of the proposed project and implementation alternatives relative to the subject resource area. The implementation alternatives evaluated in this document are evaluated on a region-wide level for impacts for each resource area. Project-level analysis is expected to be conducted by the appropriate public agencies prior to implementation of project specific methods of compliance. The environmental analysis in this document assumes that the project specific methods of compliance with Biological Objectives would be designed, installed, and maintained following all applicable state and local laws, regulations, and ordinances. A multitude of handbooks is available and currently used by municipal agencies that provide guidance for the selection and implementation of BMPs for various project types and scenarios. (e.g. [California Stormwater Quality Association](#), USDA 2012, Caltrans 2017).

Adoption of Biological Objectives will not cause any change in the type of compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat. Compliance methods to address pollutant discharges and restore stream habitat are already required by the San Diego Water Board, and thus any potential impacts have occurred or will occur under existing water quality criteria. This baseline compliance condition will not change with the adoption of Biological Objectives. However, Biological Objectives are expected to provide clarity in the implementation of compliance measures to meet existing Beneficial Uses by providing the information to focus on specific pollutants causing impacts to beneficial uses, as well as incorporating considerations of site-specific habitat conditions. This is expected to better focus existing compliance measures, thus reducing potential impacts associated with the present implementation of unnecessary compliance measures. Despite this overall consideration, the San Diego Water Board evaluated impacts for these existing compliance requirements (see Section 1.5.4).

1.5.3. Level of Analysis

The San Diego Water Board is the lead agency for Biological Objectives, while a local or regional agency may be the lead agency for CEQA compliance for approval and implementation of a project specific method of compliance with Biological Objectives.

The San Diego Water Board does not specify the actual means of compliance by which permittees choose to comply with Biological Objectives. However, as required by the Water Board’s certified regulatory program, this Staff Report and SED analyzes the potential environmental impacts of Biological Objectives and the reasonably foreseeable methods of compliance on a region-wide level. The specificity of the “activity” described in this Staff Report related to the reasonably foreseeable methods of compliance is of a general nature and the level of analysis of the potentially significant adverse environmental effects is commensurate with that level of detail. At the time of approval of a project-specific compliance project where the detail of the method of compliance is known, a project-level environmental analysis may be performed by the local approval agency.

Project-level impacts of the reasonably foreseeable methods of compliance will necessarily vary depending on the choice of compliance and the size, location, and type of discharger and the environmental resources in and around the project site. It would be speculative to estimate the specific impacts of Biological Objectives caused by implementation of a project-specific compliance method. It is possible that, at a specific site with particularly sensitive environmental resources, implementation with compliance measures could cause potentially significant impacts as compared to baseline conditions. Since it is speculative to estimate the type, size, and location of any particular compliance method (e.g., type of construction activities and type of resources adversely affected by those activities), this evaluation makes no attempt to quantify the impacts associated with implementation or maintenance of a particular compliance method.

Per the requirements of the Water Board’s environmental regulations, the resource analysis in this section includes:

- An identification of any significant or potentially significant adverse environmental impacts of the proposed project;
- An analysis of reasonable alternatives to the project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts; and
- An environmental analysis of the reasonably foreseeable methods of compliance, including:
 - An identification of the reasonably foreseeable methods of compliance with the project;
 - An analysis of any reasonably foreseeable significant adverse environmental impacts associated with those methods of compliance;
 - An analysis of reasonably foreseeable alternative methods of compliance that would have less significant adverse environmental impacts; and
 - An analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable significant adverse environmental impacts of the reasonably foreseeable methods of compliance. (CCR, tit. 23, § 3777.)

1.5.4.Environmental Impacts (Checklist)

PROJECT TITLE:

Basin Plan Amendment Incorporating Biological Objectives for the San Diego Region

LEAD AGENCY NAME AND ADDRESS:

California Regional Water Quality Control Board, San Diego Region
2375 Northside Drive, Suite 100, San Diego, CA 92108-2700

LEAD AGENCY CONTACT PERSON:

Mr. Chad Loflen
California Regional Water Quality Control Board, San Diego Region
Groundwater Protection Branch
2375 Northside Drive, Suite 100, San Diego, CA 92108-2700
619-521-3370
Chad.Loflen@waterboards.ca.gov

The environmental factors checked below could be potentially affected by this project.

- | | | |
|---|---|---|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Agriculture and Forestry Resources | <input type="checkbox"/> Air Quality |
| X Biological Resources | <input type="checkbox"/> Cultural Resources | <input type="checkbox"/> Geology/Soils |
| <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards & Hazardous Materials | <input type="checkbox"/> Hydrology/Water Quality |
| <input type="checkbox"/> Land Use/Planning | <input type="checkbox"/> Energy and Mineral Resources | <input type="checkbox"/> Noise |
| <input type="checkbox"/> Population/Housing | <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Recreation |
| <input type="checkbox"/> Transportation/Traffic | <input type="checkbox"/> Public Services | <input type="checkbox"/> Mandatory Findings of Significance |
| | <input type="checkbox"/> Utilities/Service Systems | |

Section 1. **Aesthetics.** Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?				X
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				X

DISCUSSION

Although Biological Objectives do not require land alteration, it is expected that some minimal land alteration would be associated with several of the reasonably foreseeable methods of compliance. Land alterations may occur if low impact development BMPs are installed or other means are employed to divert runoff from running directly into streams or other waterbodies. While compliance may require the installment of BMPs, it is unlikely that the aesthetics of the natural environment would be adversely affected by improvements to existing infrastructure or discharge locations. Monitoring and assessment for Biological Objectives typically occurs on an annual basis within surface waters of the San Diego Region. Such activities would not be of a size, scale, or duration that would result in the obstruction of a scenic vista, substantially damage scenic resources, degrade the existing visual character or quantity of a site or its surroundings, or create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. In-stream restoration activities would result in improvements to scenic vistas and scenic resources, including the natural visual character of specific sites and areas. The implementation of LID BMPs would also improve the visual character of sites and their surroundings (USEPA 2012b).

In summary, implementation of Biological Objectives will have a less than significant impact on aesthetics. In addition, the adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria.

Section 2. Agriculture and Forestry Resources. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the State’s inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project: Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				X

DISCUSSION

Implementation of Biological Objectives do not alter zoning laws or require conversion of cropland to different land uses. Biological Objectives will not significantly alter the current control programs or requirement that BMPs be installed to reduce or prevent pollutants from being discharged associated with agricultural and forestry resources. Reasonably foreseeable methods of compliance with Biological Objectives are already required in the San Diego Region and do not involve the conversion of agricultural lands. Additional monitoring and assessment can occur within agricultural and forestry lands but such sampling and assessment does not convert or result in farmland loss.

The use of Biological Objectives as a water quality benchmark in the San Diego Water Board's Waste Discharge Requirements is expected to assist in the identification of specific pollutants of concern for agricultural operations that discharge to streams, and thus identify specific types of BMPs to reduce or prevent those pollutants from being discharged. The implementation of focused or modified structural BMPs to reduce or prevent pollutants from being discharged could feasibly result in changes within very small areas of farmland to structural BMPs (e.g. a sediment detention basin). However, these BMPs are already required under the current Waste Discharge Requirements and are expected to be of a less than significant size. In addition, Biological Objectives are expected to provide clarity on those specific pollutants that may be causing or contributing to degradation of Beneficial Uses, which is expected to prevent the unnecessary conversion of farmland to BMPs that unnecessarily target pollutants that are not degrading beneficial uses.

Section 3. **Air Quality.** Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?				X
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			X	
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?			X	
e) Create objectionable odors affecting a substantial number of people?			X	

DISCUSSION

State Law

The California Air Resources Board (ARB) is a board within the California Environmental Protection Agency that coordinates local, state and federal air pollution control programs in California. In 1988, the State Legislature adopted the California Clean Air Act (Health & Safety Code, § 39000 et seq.), which established a statewide air pollution control program. The California Clean Air Act’s requirements include annual emission reductions, increased development and use of low emission vehicles, and submittal of air quality attainment plans by air districts. The ARB has established state ambient air quality standards, also shown in Table 2. Additionally, the ARB has established state standards for pollutants that have no federal ambient air quality standard, including sulfate, visibility, hydrogen sulfide, and vinyl chloride.

The ARB has established state ambient air quality standards to identify outdoor pollutant levels considered safe for the public. Ambient air quality standards define clean air, and are established to protect even the most sensitive individuals in our communities. An air quality standard defines the maximum amount of a pollutant that can be present in outdoor air without harm to the public's health. In addition to state standards, the federal Clean Air Act (42 U.S.C. § 7401, et seq.) requires USEPA to set national ambient air quality standards (federal standards or national standards). The ARB makes area designations for ten pollutants: ozone, suspended particulate matter (PM₁₀ and PM_{2.5}), carbon monoxide, nitrogen dioxide, sulfur dioxide, sulfates, lead, hydrogen sulfide, and visibility reducing particles.

After state standards are established, state law requires the ARB to designate each area as attainment, nonattainment, or unclassified for each state standard. The area designations, which are based on the most recent available data, indicate the healthfulness of air quality throughout the state. Classifications determine the applicability and minimum stringency of pollution control requirements.

The gaseous criteria pollutants, particulate matter, and toxic air contaminants, and the associated adverse health effects of these air quality contaminants are summarized below. Daily emissions and pollutant concentrations are used to quantify air pollution. The term “emissions” means the quantity of pollutant released into the air and has units of pounds per day (lbs /day). The term “concentrations” means the amount of pollutant material per volumetric unit of air and has units of parts per million (ppm) or micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

Carbon Monoxide

Exposure to high concentrations of carbon monoxide, a colorless and odorless gas, reduces the oxygen-carrying capacity of the blood, and therefore can cause dizziness and fatigue, impair central nervous system functions, and induce angina in persons with serious heart disease. Carbon monoxide is emitted almost exclusively from the incomplete combustion of fossil fuels. In urban areas, motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains emit carbon monoxide. Motor vehicle exhaust releases most of the carbon monoxide in urban areas. Vehicle exhaust contributes approximately 56 percent of all carbon monoxide emissions nationwide and up to 95 percent in cities. Carbon monoxide is a non-reactive air pollutant that dissipates relatively quickly. As a result, ambient carbon monoxide concentrations generally follow the spatial and temporal distributions of vehicular traffic. Carbon monoxide concentrations are influenced by local meteorological conditions; primarily wind speed, topography, and atmospheric stability. Carbon monoxide from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions combine with calm atmospheric conditions.

Ozone

While ozone serves a beneficial purpose in the upper atmosphere (stratosphere) by reducing potentially harmful ultraviolet radiation, when it reaches elevated concentrations in the lower atmosphere it can be harmful to the human and to sensitive species of plants. Short-term ozone exposure can reduce lung function and increase an individual's susceptibility to respiratory infection. Long-term exposure can impair lung defense mechanisms and lead to emphysema and/or chronic bronchitis. Ozone concentrations build to peak levels during periods of light winds or stagnant air, bright sunshine, and high temperatures. Ideal conditions occur during summer and early autumn. Sensitivity to ozone varies among individuals. About 20 percent of the population is sensitive to ozone, with exercising children being particularly vulnerable. Ozone is formed in the atmosphere by a complex series of chemical reactions under sunlight that involve "ozone precursors." Ozone precursors are categorized into two families of pollutants: oxides of nitrogen and reactive organic compounds. Oxides of nitrogen and reactive organic compounds are emitted from a variety of stationary and mobile sources. While oxides of nitrogen are considered a criteria pollutant, reactive organic compounds are not in this category, but are included in this discussion as ozone precursors. Ozone is the chief component of urban smog and the damaging effects of photochemical smog generally relate to the concentration of ozone. Meteorology and terrain play major roles in ozone formation. The greatest source of smog producing gases is the automobile.

Nitrogen Dioxide

The major health effect from exposure to high levels of nitrogen dioxide is the risk of acute and chronic respiratory disease. Like ozone, nitrogen dioxide typically is not directly emitted, but it is formed through a rapid reaction between nitric oxide and atmospheric oxygen. Nitric oxide and nitrogen dioxide are collectively called oxides of nitrogen and are major contributors to ozone formation. Nitrogen dioxide also contributes to the formation of respirable particulate matter (see discussion of respirable particulate matter below) and fine particulate matter through the formation of nitrate compounds. At atmospheric concentrations, nitrogen dioxide is only potentially irritating. In high concentrations, the result is a brownish-red cast to the atmosphere and reduced visibility.

Sulfur Dioxide

The major health effect from exposure to sulfur dioxide is acute and chronic respiratory disease. Exposure may cause narrowing of the airways, which may cause wheezing, chest tightness, and shortness of breath. Sulfur dioxide can also react with water in the atmosphere to form acids (or “acid rain”), which can cause damage to vegetation and man-made materials. The main source of sulfur dioxide is coal and fuel oil combustion in power plants and industries, as well as diesel fuel combustion in motor vehicles. Generally, the highest levels of sulfur dioxide are found near large industrial complexes. In recent years, sulfur dioxide concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of sulfur dioxide and by limiting the sulfur content in fuel. Sulfur dioxide concentrations in southern California have been reduced to levels well below the state and national ambient air quality standards, but further reductions in emissions are needed to attain compliance with ambient air quality standards for sulfates, respirable particulate matter, and fine particulate matter, to which sulfur dioxide is a contributor.

Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Particulate matter is regulated as respirable particulate matter (inhalable particulate matter less than ten micrometers in diameter). More recently it has been subdivided into coarse and fine fractions, with particulate matter less than 2.5 micrometers in diameter constituting the fine fraction. Major sources of respirable particulate matter include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter results from fuel combustion (e.g., from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, fine particulate matter can be formed in the atmosphere from gases such as sulfur dioxide, oxides of nitrogen, reactive organic compounds, and ammonia, and elemental carbon. Fine particulate matter is a subset of respirable particulate matter.

The health effects from long-term exposure to high concentrations of particulate matter are increased risk of chronic respiratory disease like asthma and altered lung function in children. Particles with 2.5 to 10 microns in diameter tend to collect in the upper portion of the respiratory system. Particles that are 2.5 microns or less are so tiny that they can penetrate deeper into the lungs and damage lung tissues. These substances can be absorbed into the bloodstream and cause damage elsewhere in the body. Short-term exposure to high levels of particulate matter has been shown to increase the number of people seeking medical treatment for respiratory distress, and to increase mortality among those with severe respiratory problems. Particulate matter also results in reduced visibility. Ambient particulate matter has many sources. It is emitted directly by combustion sources like motor vehicles, industrial facilities, and residential wood burning, and in the form of dust from ground-disturbing activities such as construction and farming. It also forms in the atmosphere from the chemical reaction of precursor gases.

Toxic Air Contaminants

Toxic air contaminants include air pollutants that can produce adverse public health effects, including carcinogenic effects, after long-term (chronic) or short-term (acute) exposure. One source of toxic air contaminants is combustion of fossil fuels or digester gas. Human exposure occurs primarily through inhalation, although non-inhalation exposure can also occur when toxic air contaminants in particulate form deposit onto soil and drinking water sources and enter the food chain or are directly ingested by humans. Many pollutants are identified as toxic air contaminants because of their potential to increase the risk of developing cancer. For toxic air contaminants that are known or suspected carcinogens, it has been found that there are no levels or thresholds below which exposure is risk free. No ambient air quality standards exist for toxic air contaminants, except that standards for lead, hydrogen sulfide, and vinyl chloride are provided in California Ambient Air Quality Standards. Instead, numerous national, state, and local rules that affect both stationary and mobile emission sources regulate toxic air contaminants emissions. Individual toxic air contaminants vary greatly in the risk they present; at a given level of exposure one toxic air contaminants may pose a hazard that is many times greater than another. Where data are sufficient to do so, a “unit risk factor” can be developed for cancer risk. The unit risk factor expresses assumed risk to a hypothetical population, the estimated number of individuals in a million who may develop cancer as the result of continuous, lifetime (70-year) exposure to one microgram per cubic meter ($\mu\text{g}/\text{m}^3$) of the toxic air contaminants. Unit risk factors provide a standard that can be used to establish regulatory thresholds for permitting purposes. This is, however, not a measure of actual health risk because actual populations do not experience the extent and duration of exposure that the hypothetical population is assumed to experience. For non-cancer health effects, a similar factor called a Hazard Index is used.

Areas with monitored pollutant concentrations that are lower than ambient air quality standards are designated as “attainment areas” on a pollutant-by-pollutant basis. When monitored concentrations exceed ambient standards, areas are designated as “nonattainment areas.” An area that recently exceeded ambient standards, but is now in attainment, is designated as a “maintenance area.” Nonattainment areas are further classified based on the severity and persistence of the air quality problem as “moderate” “severe” or “serious.” Classifications determine the applicability and minimum stringency of pollution control requirements.

Regulatory Setting

Federal

The USEPA is the federal agency charged with administering the federal Clean Air Act Amendments of 1990, which established a number of requirements. The USEPA oversees state and local implementation of federal Clean Air Act requirements. The Clean Air Act Amendments require the USEPA to approve State Implementation Plans to meet and/or maintain the national ambient standards.

The federal (and California) ambient air quality standards are shown below.

Table 2. Federal and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	Federal Standards Primary	Federal Standards Secondary
Ozone	1 Hour	0.09 ppm (180 µg/m ³)	-	Same as Primary Standard
Ozone	8 Hour	0.070 ppm (137 µg/m ³)	0.075 ppm (147 µg/m ³)	
Respirable Particulate Matter	24 Hour	50 µg/m ³	150 µg/m ³	Same as Primary Standard
Respirable Particulate Matter	Annual Arithmetic Mean	20 µg/m ³	-	
Fine Particulate Matter	24 Hour	No Separate State Standard	35 µg/m ³	35 µg/m ³
Fine Particulate Matter	Annual Arithmetic Mean	12 µg/m ³	12.0 µg/m ³	15.0 µg/m ³
Carbon Monoxide	1 Hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	-
Carbon Monoxide	8 Hour	9.0 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	
Carbon Monoxide	8 Hour (Lake Tahoe)	6 ppm (7 mg/m ³)	-	-
Nitrogen Dioxide	Annual Arithmetic Mean	0.030 ppm (57 µg/m ³)	0.053 ppm (100 µg/m ³)	Same as Primary Standard
Nitrogen Dioxide	1 Hour	0.18 ppm (339 µg/m ³)	100 ppm (188 µg/m ³)	-
Sulfur Dioxide	Annual Arithmetic Mean	-	0.030 ppm	-
Sulfur Dioxide	24 Hour	0.04 ppm (105 µg/m ³)	0.14 ppm (365 µg/m ³)	-
Sulfur Dioxide	3 Hour	-	-	0.5 ppm (1300 µg/m ³)
Sulfur Dioxide	1 Hour	0.25 ppm (655 µg/m ³)	75 ppb (195 µg/m ³)	-
Lead	30 Day Average	1.5 µg/m ³	-	-
Lead	Calendar Quarter	-	1.5 µg/m ³	Same as Primary Standard

State

The California Air Resources Board is the state agency responsible for coordinating both state and federal air pollution control programs in California. In 1988, the State Legislature adopted the California Clean Air Act, which established a statewide air pollution control program. The California Clean Air Act's requirements include annual emission reductions, increased development and use of low emission vehicles, and submittal of air quality attainment plans by air districts. The California Air Resources Board has established state ambient air quality standards, shown in Table 2.

Additionally, the California Air Resources Board has established state standards for pollutants that have no federal ambient air quality standard, including sulfate, visibility, hydrogen sulfide, and vinyl chloride.

Local

With the San Diego Region there are two Air Pollution Control Districts. Districts are responsible for controlling emissions, primarily from stationary sources of air pollution, within their area. Districts develop and adopt an Air Quality Management Plan, which serves as the blueprint to bring their respective areas into compliance with federal and state clean air standards. Rules are adopted to reduce emissions from various sources.

Impacts and Mitigation

Compliance with Biological Objectives would not cause any significant changes in population or employment. Therefore, it is not expected to generate ongoing traffic-related emissions. Biological Objectives will not require construction of any permanent emissions sources. For these reasons, no permanent changes in air emissions would occur and Biological Objectives would not conflict with applicable air quality plans or violate any air quality standards. Therefore, no air quality impacts would result.

Compliance with Biological Objectives may involve short term and discrete construction activities during program implementation. These activities, which have been identified in the reasonably foreseeable methods of compliance, are already required under existing regulatory programs. These activities should address any short-term impacts and identify any mitigation required and should not create any significant air quality impacts. This should also prevent exposure of sensitive receptors to substantial pollutant concentrations.

Biological Objectives would potentially create new traffic-related emissions related to focused or modified sampling frequency and/or implementation of focused non-structural BMPS (e.g. inspections) for prioritized locations, which could require additional vehicle trips for those areas. However, the magnitude, frequency, and duration of these events (e.g. requiring annual site visits) would not result in a cumulative considerable net increase of any pollutant for which the project region is in non-attainment of air quality standards and no air quality impacts would result. These potential additional trips in priority areas are not expected to result in substantial pollutant concentrations that would result in exposure to sensitive receptors. These potential additional trips in priority areas are also not expected to be on a scale large enough to produce any objectionable odors affecting a substantial number of people.

Measures to lessen the air emissions caused by vehicle trips or construction equipment include: (1) use of sampling, inspection, construction, and/or maintenance vehicles with zero or lower-emission engines; (2) use of soot reduction traps or diesel particulate filters; and (3) use of emulsified diesel fuel for construction vehicles.

Lastly, despite their potential short term and less than significant air quality impacts associated with temporary construction, both in-stream habitat restoration and implementation of low-impact development BMPs are expected to improve air quality, particularly in highly urbanized areas (Dwyer et al. 1992, Boland and Hunhammar 1999, USEPA 2012d).

Summary

Adoption of Biological Objectives is projected to have no significant impact on air quality, and some methods of compliance (in-stream habitat restoration, green infrastructure) are expected to improve air quality. All reasonably foreseeable methods of compliance would not be of the size, scale, or duration to result in alteration of air movement, pollution, moisture or temperature, or any change in climate, either locally or regionally. Potential impacts to air quality due to implementation of Biological Objectives should be temporary and insignificant.

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. The vast majority of potential air quality impacts have occurred or will occur under existing permit requirements, and this baseline condition will not change with the adoption of the Biological Objectives. The addition of vehicle trips from monitoring and assessment activities is not expected to be of a scale sufficient enough to result in a substantial potential impact.

Outside of directed monitoring and assessment for compliance, the San Diego Water Board does not direct which compliance measures responsible agencies choose to adopt or the mitigation measures they employ for permit compliance related to discharges. The San Diego Water Board does, however, recommend that appropriate measures be applied to reduce or avoid potential environmental impacts that may be identified during the environmental review of project-level compliance measures.

Section 4. **Biological Resources.** Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?			X	
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			X	
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			X	
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

DISCUSSION

Compliance with Biological Objectives is likely to require construction and maintenance activities in areas that may be proximal to the presence of fish and wildlife species and their supporting habitat. The Basin Plan amendment was developed specifically to benefit, enhance, restore and protect biological resources, including fish, wildlife, rare and endangered species, and habitat. Nonetheless specific projects involving construction and earthmoving activities could potentially affect candidate, sensitive or special status species (collectively, special status species). Active in-stream restoration activities, would result in short-term impacts on protected wetlands, and potential impacts on fish and wildlife species, though long-term condition would be improved. Monitoring and assessment activities occur within specific supporting habitats of fish and wildlife species and, though unlikely based upon the magnitude, scope, and duration of bioassessment, may have the potential to result in potentially significant impacts. Project-specific permitting through existing regulatory agencies is already required to mitigate potential impacts for such activities. These permitting requirements are already required within the existing regulatory compliance framework, and include the incorporation of mitigation measures to insure impacts are less than significant. Minor construction and earthmoving operations would likely occur and might involve reconstruction, recontouring, or replacement of existing roads and structures, it is possible that these and other activities could proximal to areas where there are special status species and habitats. However, these activities are reasonably foreseeable to occur in already disturbed areas associated with existing regulated sites, systems, and facilities. In the long term, compliance measures would result in the protection and restoration of biological resources.

Regulatory Setting

Federal Endangered Species Act

Pursuant to the federal ESA, the U. S. Fish and Wildlife Service and National Oceanic and Atmospheric Administration Fisheries Service, formerly National Marine Fisheries Service, have regulatory authority over federally listed species. Under the ESA, a permit is required for any federal action that may result in “take” of a listed species. Section 9 of the ESA defines take as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Under federal regulations, take is further defined to include the modification or degradation of habitat where such activity results in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.

Clean Water Act

Section 404 of the Clean Water Act requires project proponents to obtain a permit from the U.S. Army Corps of Engineers before performing any activity that involves discharge of dredged or fill material into “waters of the United States,” including wetlands. Dredge and fill activities involve any activity, such as construction, that results in direct modification (e.g., alteration of the banks, deposition of soils) of an eligible waterway. Waters of the United States include navigable waters, interstate waters, and other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. Many surface waters and wetlands in California meet the criteria for waters of the United States.

In accordance with section 401 of the Clean Water Act, projects that apply for a U.S. Army Corps of Engineers permit for discharge of dredged or fill material must obtain water quality certification from the Water Boards indicating that the project would uphold state water quality standards.

California Endangered Species Act

Pursuant to the California Endangered Species Act, a permit from the California Department of Fish and Wildlife is required for projects that could result in take of a plant or animal species that is state listed as threatened or endangered. Under California ESA, “take” is defined as an activity that would directly or indirectly kill an individual of a species. Authorization for take of state-listed species can be obtained through a California Fish and Wildlife Code section 2080.1 consistency determination or a section 2081 incidental take permit.

Section 1600 of the California Fish and Wildlife Code

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream or lake in California that supports wildlife resources is subject to regulation by the California Department of Fish and Wildlife, under sections 1600–1603 of the California Fish and Wildlife Code. Section 1601 states that it is unlawful for any agency to substantially divert or obstruct the natural flow or substantially change the bed, channel or bank of any river, stream or lake designated by California Department of Fish and Wildlife, or use any material from the streambeds, without first notifying California Department of Fish and Wildlife of such activity. The regulatory definition of a stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation. California Department of Fish and Wildlife’s jurisdiction within altered or artificial waterways is based on the value of those waterways to fish and wildlife. Accordingly, a California Department of Fish and Wildlife Streambed Alteration Agreement must be obtained for any project that would result in diversions of surface flow or other alterations to the bed or bank of a river, stream, or lake.

Section 1002 of California Fish and Wildlife Code and Title 14 Sections 650 and 670 of California Regulations

California regulations require any entity proposing to take, collect, capture, mark, or salvage, for scientific, educational, and non-commercial propagation purposes, mammals, birds and their nests and eggs, reptiles, amphibians, fishes, and invertebrates obtain a collecting permit from the California Department of Fish and Wildlife. Scientific Collecting Permits include restrictions, limitations, and conditional measures on the collection of wildlife. Therefore, any biological monitoring, including bioassessment, that proposes to take organisms is required to obtain a Scientific Collecting Permit.

Porter-Cologne Water Quality Control Act

Under the Porter-Cologne Water Quality Control Act, “waters of the state” fall under the jurisdiction of the appropriate regional water board. The regional water board must prepare and periodically update Basin Plans. Each Basin Plan establishes numerical or narrative water quality objectives to protect established beneficial uses, which include wildlife, fisheries and their habitats. Projects that affect wetlands or waters of the state must meet discharge requirements of the regional water board, which may be issued in addition to a water quality certification or waiver under section 401 of the Clean Water Act.

Local Regulations

Numerous California cities and counties have adopted ordinances regulations and policies for the protection and enhancement of natural resources, including heritage trees, important natural features, habitat alteration, and common and special status species.

Impacts and Mitigation

The specific location of each compliance measure, if any, would be determined during the implementation of the specific measures and not during the development and adoption of Biological Objectives. In general, the activities that would take place in order to achieve or maintain compliance with Biological Objectives would be similar in nature to current compliance activities that are already occurring throughout the San Diego Region. Compliance with Biological Objectives would not foreseeably:

- Cause a substantial reduction of the overall habitat of a wildlife species.
- Produce a drop in a wildlife population below self-sustaining levels.
- Eliminate a native plant or animal community.
- Have a substantial adverse effect on federally protected wetlands.
- Conflict with any local policies or ordinances protecting biological resources.

It is not reasonably foreseeable that either the construction/implementation or maintenance phase of potential projects would result in a significant long-term impact to general wildlife species, and that the implementation of Biological Objectives would actually protect and improve biological resource conditions.

Monitoring and assessment for Biological Objectives typically occurs on an annual basis over a limited time period (hours to days) within surface waters of the San Diego Region. Current and proposed additional biological monitoring, such as stream bioassessment sampling, does not target any sensitive benthic macroinvertebrate or algal species, nor is the collection of candidate, special status, or sensitive species required. Where additional collections may be required for compliance purposes, the collections may result in non-substantial effects on species, habitats, and species movements associated with collection activities. These potentially significant impacts are not substantial and would be addressed on a project-specific basis and through the existing review process for Scientific Collection Permitting.

Reasonably foreseeable means of compliance that involve structural best management practices construction activities would be implemented in areas outside of receiving waters, and are expected to occur in areas that are already degraded or developed with minimal biological resources. Under the CWA and San Diego Water Board Basin Plan, receiving waters are not to be used for waste transport or treatment. Since these areas are outside of receiving waters and are expected to occur in previously disturbed areas, it is not reasonably foreseeable that they would cause the removal, disturbance or change in diversity of any special status species or cause a change or reduction in the number of any unique, rare or endangered species. Nor are they expected to considerably restrict wildlife movement, including migratory avian species, or conflict with conservation plans. Depending on the final location of facilities, however, potential impacts to biological resources, such as trees, protected under local ordinances or policies could occur, though they are not expected to be substantial, existing avoidance and mitigation measures are available, and sufficient flexibility is present within the permit implementation so that reasonably foreseeable compliance methods are not expected to conflict with policies and ordinances to protect natural resources. The implementation of Biological Objectives will serve to better protect and restore native habitat and species, as well as guide local ordinances and policies in the protection of habitat.

It is possible that direct or indirect impacts to special-status animal species may occur at the project level. However, such impacts are not expected to be substantial, and potential impacts to special status species and their habitats are expected to occur within the San Diego Water Board's jurisdiction (e.g., in waters of the state). In-stream restoration activities are and may be conducted by a variety of entities for the purpose of restoration of biological condition related to Beneficial Uses. Such projects include, but are not limited to, modification of stream crossings to facilitate species movement (e.g. fish passage), removal of non-native species to restore riparian habitat, and reclamation of the flood plain to improve storm water infiltration and species habitat. Such projects are expected to improve water quality, including for Biological Objectives, and may have potentially significant impacts that are addressed through environmental review on the project scale. Depending on the project-specific location and restoration activity, which may be highly variable in scope, duration, and effects, these projects may potentially result in significant impacts to species, habitat, wetlands, and fish and wildlife movement. Such projects are required to undergo site-specific environmental review and permitting, consistent with CWA Section 404, 401, Porter-Cologne, and California Fish and Game Code, as applicable, with associated agency-mandated mitigation measures to reduce potentially significant impacts. Such projects, including environmental review and permitting, will be conducted by the local agency and/or entity proposing the project. While such projects may have temporary project-specific biological impacts, the projects have long-term biological improvement for those resources identified in this section, and are also expected to occur in habitats that are already largely degraded.

The San Diego Water Board, in the course of carrying out its statutory duties to protect water quality and beneficial uses (including preservation of rare and endangered species and wildlife habitat as set forth in the Basin Plan), will either not approve compliance projects with significant adverse impacts on special status species and habitats or require avoidance or mitigation measures to reduce impacts to less than significant levels. It is not reasonably foreseeable that the San Diego Water Board would approve earthmoving work that would disrupt or destroy habitat of a known special status species (since protection of rare and endangered species is one of the beneficial uses). Furthermore, it is the San Diego Water Board's standard practice to work with the proponents of compliance projects to come up with actions that not only meet and further the proposed Basin Plan amendment's requirements and goals, but also all other components of the Basin Plan, such as protection of rare and endangered species and habitat. For example, where avoidance of impacts is not possible, the San Diego Water Board requires mitigation measures for work it approves that may impact special status species, riparian habitats, or other sensitive natural communities. These include but are not limited to requiring pre-construction surveys; construction buffers and setbacks; restrictions on construction during sensitive periods of time; employment of on-site biologists to oversee work; and avoidance of construction in known sensitive habitat areas or relocation and restoration of sensitive habitats. Specific discussion regarding in-stream restoration on biological resources is included below.

State and federal laws prohibit the take of special status species and their habitats except where incidental take permits have been issued. When issuing incidental take permits, state and federal agencies must ensure that the impacts of the take are minimized and mitigated to the maximum extent possible and ensure that the take will not appreciably reduce the likelihood of the survival and recovery of the species. Because these animal species are protected by state and/or federal ESAs, impacts to them would be considered potentially significant but are not expected to be at a substantial level. If these species are present during activities such as monitoring, assessment, ground disturbance, construction, and operation and maintenance activities associated with the potential projects, it could conceivably result in direct impacts to special status species including the following:

- Direct loss of a sensitive species.
- Increased human disturbance in previously undisturbed habitats.
- Mortality by construction or other human-related activity.
- Impairing essential behavioral activities, such as breeding, feeding or shelter/refugia.
- Destruction or abandonment of active nest(s)/den sites.
- Direct loss of occupied habitat.

In addition, potential indirect impacts may include but are not limited to, the following:

- Displacement of wildlife by monitoring and/or construction activities.
- Disturbance in essential behavioral activities due to an increase in ambient noise levels and/or artificial light from outdoor lighting around facilities.

Construction activities related to habitat restoration within waters of the State are not expected to considerably restrict wildlife movement, and are expected to improve wildlife habitat and movement over time. A travel route is generally described as a landscape feature (such as a ridgeline, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (e.g. water, food, and den sites). Wildlife corridors are generally an area of habitat, usually linear in nature, which connect two or more habitat patches that would otherwise be fragmented or isolated from one another.

Construction activities may impact migratory avian species. These avian species may use portions of potential project sites during breeding season and may be protected under the Migratory Bird Treaty Act while nesting. The Migratory Bird Treaty Act includes provisions for protection of migratory birds under the authority of the U.S. Fish and Wildlife Service and California Fish and Wildlife. The Migratory Bird Treaty Act protects over 800 species including, geese, ducks, shorebirds, raptors, songbirds, and many other relatively common species. In-stream habitat restoration is expected to improve habitat for migratory avian species.

It is not reasonably foreseeable that construction activities would result in the deterioration of existing fish and or wildlife habitat, or have an adverse effect on wetlands. In-stream habitat restoration would improve the conditions for wetlands and habitat.

The following measures should be implemented to reduce or avoid potential project-level impacts to biological resources:

Assuming any unique species are present, plant number and species diversity could be maintained by either preserving them prior, during, and after the construction or by re-establishing and maintaining the plant communities post construction.

When the specific projects are developed and sites identified, a search of the California Natural Diversity Database could be employed to confirm that any potentially sensitive plant species or biological habitats in the site area are properly identified and protected as necessary. Focused protocol plant surveys for special-status-plant species could be conducted at each site location, if appropriate. If sensitive plant species occur on the project site mitigation would be required consistent with appropriate expert analysis. Mitigation measures shall be developed in coordination with U.S. Fish and Wildlife Service and California Department of Fish and Wildlife. Responsible agencies should endeavor to avoid compliance measures that could result in reduction of the numbers of any unique, rare or endangered species of plants, and instead opt for siting physical compliance measures sufficiently upstream or downstream of sensitive areas to avoid any impacts.

Responsible agencies should endeavor to avoid compliance measures that could result in impacts to unique, rare or endangered (special-status) species, should any such species be present at locations where such compliance measures might otherwise be performed. Construction, monitoring and assessment activities should be planned and designed at the project level to avoid locations during critical time periods. Mitigation measures, however, could be implemented to ensure that potentially significant impacts to special status animal species are less than significant. When the specific projects are developed and sites identified a search of the California Natural Diversity Database could be employed to confirm that any potentially special-status animal species in the site area are properly identified and protected as necessary. Focused protocol animal surveys for special-status animal species should be conducted at each site location.

If special-status animal species are potentially near the project site area two weeks prior to grading or the construction of facilities and per applicable U.S. Fish and Wildlife Service and/or California Department of Fish and Wildlife protocols, pre-construction surveys to determine the presence or absence of special-status species would be conducted. The surveys should extend off site to determine the presence or absence of any special-status species adjacent to the project site. If special-status species are found to be present on the project site or within the buffer area, mitigation should be required consistent with appropriate expert analysis. To this extent, mitigation measures would be developed in coordination with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife to reduce potential impacts.

For monitoring and assessment activities, resource agency review of project-specific locations will incorporate mitigation requirements and restrictions to prevent potentially significant impacts and insure impacts are less than significant.

If construction activities occur at locations where they would foreseeably adversely impact species migration or movement patterns, mitigation measures previously described could be implemented to ensure that impacts which may result in a barrier to the migration or movement of animal is less than significant. Any site-specific wildlife crossings should be evaluated in consultation with California Department of Fish and Wildlife. If a wildlife crossing would be significantly impacted in an adverse manner, then the design of the project should include a new wildlife crossing in the same general location.

If construction occurs during the avian breeding season for special status species and/or Migratory Bird Treaty Act -covered species, generally February through August, then prior (within two weeks) to the onset of construction activities, surveys for nesting migratory avian species would be conducted on the project site following U.S. Fish and Wildlife Service and/or California Department of Fish and Wildlife guidelines. If no active avian nests are identified on or within 200 feet of construction areas, no further mitigation would be necessary.

Alternatively, to avoid impacts, the agencies implementing the compliance measures may begin construction after the previous breeding season for covered avian species and before the next breeding season begins. If a protected avian species was to establish an active nest after construction was initiated and outside of the typical breeding season (February – August), the project sponsor, would be required to establish a buffer of 200 feet or other measure that would result in equivalent mitigation between the construction activities and the nest site.

If active nest for protected avian species are found within the construction footprint or within the 200-foot buffer zone, construction would be required to be delayed within the construction footprint and buffer zone until the young have fledged or appropriate mitigation measures responding to the specific situation are developed in coordination with U.S. Fish and Wildlife Service or California Department of Fish and Wildlife. These impacts are highly site specific, and assuming they are foreseeable, they would require a project-level analysis and mitigation plan.

Finally, to the extent feasible, responsible agencies should endeavor to avoid compliance measures that could result in significant barriers to the beneficial migration or movement of animals. No significant impact is anticipated after mitigation.

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts to biological resources have occurred or will occur under the existing implementation programs and this baseline condition will not change, with the exception of additional monitoring frequency in some cases, with the adoption of Biological Objectives.

Adverse impacts to biological resources are not expected to occur for reasonably foreseeable measure of compliance due to the nature of the activities within the existing regulatory implementation framework. In the event that specific compliance projects do encounter biological resources, measures can be identified to avoid or reduce potential impacts to less than significant levels, and specific projects would need to have an independent environmental review done by the agency conducting the work. The San Diego Water Board, in the course of carrying out its statutory duties to protect water quality and beneficial uses (including preservation of rare and endangered species and wildlife habitat as set forth in the Basin Plan), will either not approve compliance projects with significant adverse impacts on special status species and habitats or require avoidance or mitigation measures to reduce impacts to less than significant levels.

Section 5. **Cultural Resources.** Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?				X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?				X
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X
d) Disturb any human remains, including those interred outside of formal cemeteries?				X

DISCUSSION

Historic Resources

A historical resource includes resources listed in or eligible for listing in the California Register of Historical Resources. The California Register includes resources on the National Register of Historic Places, as well as California State Landmarks and Points of Historical Interest. Properties that meet the criteria for listing also include districts which reflect California’s history and culture, or properties which represent an important period or work of an individual, or yield important historical information. Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified as local historical resources are also considered a historical resource (PRC § 5024.1, 14 CCR § 4850). Based on substantial evidence within the administrative record, any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may also be considered to be an historical resource (CEQA Guidelines 15064.5(a)).

Archeological Resources

An archeological site may be considered an historical resource if it is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military or cultural annals of California or if it meets the criteria for listing on the California Register. (PRC § 5020.1(j); CCR, tit. 14, § 4850.)

If an archeological site is not an historical resource, but meets the definition of a “unique archeological resource” as defined in PRC, section 21083.2, then it should be treated in accordance with the provisions of that section.

Impacts and Mitigation

This is a San Diego Region level analysis of the potential impacts from Biological Objectives. The specific location of potential impacts would be determined during the implementation of the Biological Objectives.

Compliance projects may include focused or modified maintenance or upgrades to treatment technologies, Best Management Practices, and/or additional monitoring and reporting. Construction related activities would mostly occur in existing developed and regulated site areas where ground disturbance has previously occurred. Because these areas are already disturbed, it is unlikely and not reasonably foreseeable that construction activities would cause a substantial adverse change to historical or archeological resources, destroy paleontological resources, or disturb human remains. However, potential impacts to cultural resources could occur from construction related activities depending on unique site-specific conditions. Paleontological resources can be found in areas containing fossil-bearing formations, and archaeological resources have been found within developed sites and areas. Historic and architectural resources have also been found within developed sites and areas. The site-specific presence or absence of these resources is unknown because the specific locations for compliance measures would be determined by responsible agencies at the project level. Construction activities could result in minor ground disturbances, which could impact cultural resources if they are sited in locations containing these resources and where disturbances have not previously occurred. Monitoring and assessment activities, as well as the addition of non-structural BMPs, are not expected to result in potentially significant impacts due to their lack of ground disturbance, as well as the scale and duration of such activities.

Upon determination of specific locations where construction activities will occur, responsible agencies should complete further investigation, including consultation with Native American tribes, to make an accurate assessment of the potential to affect historic, archaeological, or historic resources or to impact any human remains. If potential impacts are identified, measures to reduce impact could include project redesign, such as the relocation of facilities outside the boundaries of archeological or historical sites. According to the California Office of Historic Preservation, avoidance and preservation in place are the preferable forms of mitigation for archeological sites. When avoidance is infeasible, a data recovery plan should be prepared which adequately provides for recovering scientifically consequential information from the site. Studies and reports resulting from excavations must be deposited with the California Historical Resources Regional Information Center.

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts to cultural resources have occurred or will continue to occur under the existing criteria and this baseline condition will not change with the adoption of Biological Objectives.

While the potential for adverse impacts to cultural resources is very low, there still exists a chance that cultural resources may occur at specific locations where related project compliance occurs. Measures can be identified that could reduce potential impacts to less than significant levels and should be incorporated into site-specific projects carried out by a local agency.

Section 6. **Geology /Soils.** Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				X
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii) Strong seismic ground shaking?				X
iii) Seismic-related ground failure, including liquefaction?				X
iv) Landslides?				X
b) Result in substantial soil erosion or the loss of topsoil?				X
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X

DISCUSSION

Impacts and Mitigation

No impact due to exposure of people to, or property to, geologic hazards such as rupture of a known earthquake fault, strong seismic ground shaking, liquefaction, or landslides is expected from the implementation of the reasonably foreseeable methods of compliance. Although areas of the state are subject to geologic hazards, compliance with standard design and construction specifications and the recommendations of geotechnical studies prepared at the project level for minor construction activities would reduce the risk of damage from seismic-related hazards. Furthermore, it is not reasonably foreseeable that responsible agencies would choose to comply with the Biological Objectives through structural means in areas where doing so would result in exposure of people or property to geologic hazards. Rather, it is foreseeable that localities would avoid such compliance measures in lieu of other compliance measures.

Project-specific compliance measures implemented for monitoring and assessment, as well as non-structural BMPs, would not involve exposure of people to, or property to, geologic hazards such as rupture of a known earthquake fault, strong seismic ground shaking, liquefaction, or landslides.

For compliance related to minor construction activities, wind or water erosion of soils may occur as a short-term impact. Siltation or deposition may occur, resulting in reduction in siltation or deposition in downstream areas. Reduction in siltation and deposition in downstream areas may be considered a positive impact associated with BMP implementation, as fine sediments may contain toxic pollutants. Little or no impact on erosion of affected watercourses is expected since the flow rate in the watercourses is expected to be improved by foreseeable methods of compliance.

Construction activities would not cause or accelerate instability due to on- or off-site landslides, lateral spreading, subsidence, expansive soils, liquefaction, or collapse. Project footprints would not be of the size or scale to result in unstable earth conditions, changes in geologic substructures, topography or ground surface relief features, or destruction, covering or modification of any unique geologic or physical features. Implementation of Biological Objectives may result in minor surface soil excavation during construction activities and result in temporarily unstable soil but would not, due to small size, however, lead to landslides, lateral spreading, subsidence, expansive soils, liquefaction, or collapse. Most of the relevant areas are already developed or under active anthropogenic use, and have already undergone soil compaction, modification, and/or hardscaping.

To the extent that compliance measures are installed in areas subject to geologic hazards, such as, ground shaking, liquefaction, liquefaction-induced hazards, or landslides, geotechnical studies prepared as part of the pre-design process would identify site-specific soil and subsurface conditions and specify design features that would keep potential seismic related impacts within acceptable levels. Compliance with existing regulations, building codes, and standards specifications would also keep potential impacts within acceptable levels. The most appropriate measure for potential fault rupture hazards is avoidance (e.g., building setbacks), as most surface faulting is confined to a relatively narrow zone a few feet to tens of feet wide (California Geological Survey 2002).

To the extent that construction activities cause an increase in erosion, typical established best management practices would be used during implementation to minimize offsite sediment runoff or deposition. Construction sites are required to retain sediments on site, either under a construction general storm water permit, and/or through the required construction program of the applicable NPDES MS4 Phase I and II permit, which are already designed to minimize or eliminate erosion impacts on receiving waters and are administered by the San Diego Water Board. No potentially significant impact is anticipated after these measures are taken.

To the extent that construction activities could result in ground instability, potential impacts could be avoided or mitigated through mapping to site facilities away from areas with unsuitable soils or steep slopes; design and installation in compliance with existing regulations; standard specifications and building codes; ground improvements such as soil compaction; and groundwater level monitoring to ensure stable conditions. No potentially significant impact is anticipated after these measures are taken.

To the extent that any soil is disturbed during construction activities, standard construction techniques, including but not limited to, shoring, piling, and soil stabilization can alleviate any potential impacts. Prior to earthwork, a geotechnical study would be conducted to evaluate geology and soil conditions. No potentially significant impact is anticipated after these measures are taken.

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts related to geology or soils have occurred or will occur under implementation programs for existing criteria and this baseline condition will not change with the adoption of Biological Objectives.

Installation and maintenance of structural control devices and treatment control BMPs are not expected to result in potentially significant environmental effects with regard to geology and soils, because responsible agencies would not reasonably site BMPs where they would risk such impacts. Further, in the unlikely occurrence of such an impact, mitigation measures, which can be applied to reduce and/or eliminate these impacts, are available as described above. These mitigation measures are within the responsibility and jurisdiction of the responsible agencies subject to Biological Objectives and can or should be adopted by them (CCR, tit. 14, § 15091(a)(2)). The San Diego Water Board does not direct which compliance measures responsible agencies choose to adopt or the mitigation measures they employ. The San Diego Water Board does, however, recommend that appropriate measures be applied to reduce or avoid potential environmental impacts.

Section 7. **Greenhouse Gas Emissions.** Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			X	

DISCUSSION.

General scientific consensus and increasing public awareness regarding global warming and climate change have placed new focus on the CEQA review process as a means to address the effects of greenhouse gas emissions from proposed projects on climate change.

Global warming refers to the recent and ongoing rise in global average temperature near Earth's surface. It is caused mostly by increasing concentrations of greenhouse gases in the atmosphere. Global warming is causing climate patterns to change. Global warming itself, however, represents only one aspect of climate change.

Climate change refers to any significant change in the measures of climate lasting for an extended period of time. In other words, climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades or longer.

General scientific consensus is that increases in the concentrations of greenhouse gases in the Earth's atmosphere are the main cause of human-induced climate change. Greenhouse gases naturally trap heat by impeding the exit of infrared radiation that results when incoming ultraviolet solar radiation is absorbed by the Earth and re-radiated as infrared radiation. The principal greenhouse gases associated with anthropogenic emissions are carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, perfluorocarbon, nitrogen trifluoride, and hydrofluorocarbon. (Health and Safety Code, § 38505, subdivision (g); CEQA Guidelines, § 15364.5) Water vapor is also an important greenhouse gas, in that it is responsible for trapping more heat than any of the other greenhouse gases. Water vapor, however, is not a greenhouse gas of concern with respect to anthropogenic activities and emissions. Each of the principal greenhouse gases associated with anthropogenic climate warming has a long atmospheric lifetime (one year to several thousand years). In addition, the potential heat trapping ability of each of these gases vary significantly from one another. Methane for instance is 23 times more potent than carbon dioxide, while sulfur hexafluoride is 22,200 times more potent than carbon dioxide. (Intergovernmental Panel on Climate Change 2001) Conventionally, greenhouse gases have been reported as "carbon dioxide equivalents." Carbon dioxide equivalents take into account the relative potency of non-carbon dioxide greenhouse gases and convert their quantities to an equivalent amount of carbon dioxide so that all emissions can be reported as a single quantity.

The primary man-made processes that release these greenhouse gases include: (1) burning of fossil fuels for transportation, heating and electricity generation, which release primarily carbon dioxide; (2) agricultural practices, such as livestock grazing and crop residue decomposition and application of nitrogen fertilizers, that release methane and nitrous oxide; and (3) industrial processes that release smaller amounts of high global warming potential gases.

In 2005, Executive Order S-3-05 proclaimed that California is vulnerable to the effects of climate change. To combat those concerns, the Executive Order established a long-range greenhouse gas reduction target of 80 percent below 1990 levels by 2050.

Subsequently, Assembly Bill 32, the California Global Warming Solutions Act of 2006 (Chapter 488, Statutes of 2006, enacting § 38500-38599 of the Health and Safety Code) was signed. Assembly Bill 32 requires California to reduce statewide greenhouse gas emissions to 1990 levels by 2020. AB 32 directed the California Air Resources Board to develop and implement regulations that reduce statewide greenhouse gas emissions.

The Climate Change Scoping Plan approved by the California Air Resources Board in December 2008, outlines the state's plan to achieve the greenhouse gas reductions required in Assembly Bill 32.

Senate Bill 97, signed in August 2007 (Chapter 185, Statutes of 2007, enacting § 21083.05 and 21097 of the PRC), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directed the Office of Planning and Research to prepare, develop, and transmit guidelines for the feasible mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions to the California Resources Agency. Office of Planning and Research developed a technical advisory suggesting relevant ways to address climate change in CEQA analyses. The technical advisory also lists potential mitigation measures, describes useful computer models, and points to other important resources. In addition, amendments to CEQA guidelines implementing Senate Bill 97 became effective on March 18, 2010.

Impacts and Mitigation

The operation of construction equipment and the operation of focused or modified treatment technologies and BMPs, or maintenance equipment would generate greenhouse gas emissions. Greenhouse gas emissions due to construction equipment would be short-term and limited to minor amounts and therefore would not significantly increase greenhouse gas levels in the environment. Greenhouse gas levels are not expected to rise significantly since mitigation measures are available to reduce greenhouse gas emissions due to construction, and maintenance activities.

Biological Objectives would potentially create new traffic-related emissions related to increased or modified sampling frequency and/or implementation of focused non-structural BMPs (e.g. inspections), which could require additional vehicle trips. However, the magnitude, frequency, and duration of these events (e.g. requiring annual site visits) would not result in potentially significant impacts based on their scale and duration. In addition, BMPs are available to reduce greenhouse gas production associated with transportation, including (1) use of sampling and inspection vehicles with zero or lower-emission engines; (2) use of public transportation where feasible; and (3) proper planning to allow for compatibility with planned non-regulatory transit.

For minor construction activities, the California Department of Water Resources has developed a set of BMPs to reduce greenhouse gas emissions from California Department of Water Resources construction and maintenance activities (CDWR 2012). These BMPs can be used and/or modified to fit specific situations by the implementing agencies to reduce greenhouse gas emissions from their activities:

BMP 1. Evaluate project characteristics, including location, project work flow, site conditions, and equipment performance requirements, to determine whether specifications of the use of equipment with repowered engines, electric drive trains, or other high efficiency technologies are appropriate and feasible for the project or specific elements of the project.

BMP 2. Evaluate the feasibility and efficacy of performing on-site material hauling with trucks equipped with on-road engines.

BMP 3. Ensure that all feasible avenues have been explored for providing an electrical service drop to the construction site for temporary construction power. When generators must be used, use alternative fuels, such as propane or solar, to power generators to the maximum extent feasible.

BMP 4. Evaluate the feasibility and efficacy of producing concrete on-site and specify that batch plants be set up on-site or as close to the site as possible.

BMP 5. Evaluate the performance requirements for concrete used on the project and specify concrete mix designs that minimize greenhouse gas emissions from cement production and curing while preserving all required performance characteristics.

BMP 6. Minimize idling time by requiring that equipment be shut down after five minutes when not in use (as required by the state airborne toxics control measure [CCR, tit. 13, § 2485]). Provide clear signage that posts this requirement for workers at the entrances to the site and provide a plan for the enforcement of this requirement.

BMP 7. Maintain all construction equipment in proper working condition and perform all preventative maintenance. Required maintenance includes compliance with all manufacturer's recommendations, proper upkeep and replacement of filters and mufflers, and maintenance of all engine and emissions systems in proper operating condition. Maintenance schedules shall be detailed in an Air Quality Control Plan prior to commencement of construction.

BMP 8. Implement tire inflation program on jobsite to ensure that equipment tires are correctly inflated. Check tire inflation when equipment arrives on-site and every two weeks for equipment that remains on-site. Check vehicles used for hauling materials off-site weekly for correct tire inflation. Procedures for the tire inflation program shall be documented in an Air Quality Management Plan prior to commencement of construction.

BMP 9. Develop a project specific ride share program to encourage carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.

BMP 10. Reduce electricity use in temporary construction offices by using high efficiency lighting and requiring that heating and cooling units be Energy Star compliant. Require that all contractors develop and implement procedures for turning off computers, lights, air conditioners, heaters, and other equipment each day at close of business.

BMP 11. For deliveries to project sites where the haul distance exceeds 100 miles and a heavy-duty class 7 or class 8 semi-truck or 53-foot or longer box type trailer is used for hauling, a SmartWay¹ certified truck would be used to the maximum extent feasible.

Biological Objectives would not conflict with any plan, amendment, or regulation adopted for the purpose of reducing greenhouse gas emissions. Most greenhouse gas reduction plans or actions taken to date include the replacement of government owned vehicles with low or zero-emission vehicles. (California Department of Water Resources 2012, CAOPR 2014, City of San Diego 2015a, County of San Diego 2017). Implementation of greenhouse gas reduction plans would reduce greenhouse gas emissions from activities undertaken to comply with Biological Objectives.

In 2007, the California Air Resources Board adopted the Off-Road Diesel Vehicle Regulation (CCR, tit. 13, article 4.8, chapter 9) which, when fully implemented, would significantly reduce emissions from off-road, non-agricultural, diesel vehicles with engines greater than 25 horsepower—the types of vehicles typically used in construction activities. The regulation required owners to replace the engines in their vehicles, apply exhaust retrofits, or replace the vehicles with new vehicles equipped with cleaner engines. The regulation also limited vehicle idling, required sales disclosure requirements, and reporting and labeling requirements. The first compliance date for large fleets was March 1, 2010; however, amendments have been made several times to extend the deadlines. When the regulation is fully implemented, owners of fleets of construction, mining, and industrial vehicles would have to upgrade the performance of their vehicle fleets to comply with the regulation.

The California Air Resources Board Scoping Plan (2008) proposes a comprehensive set of actions designed to achieve the 2020 greenhouse gas emissions reductions required under Assembly Bill 32. While some of the regulations would not be implemented until later, when they do take effect, they would likely result in reduced emissions from construction and maintenance activities. Specific actions in the Scoping Plan that would impact construction and maintenance activities include: low carbon fuel standard (Measure Transportation-2), tire inflation regulation (Measure Transportation-4), the heavy-duty tractor truck regulation (Measure Transportation-7), and commercial recycling (Measure Recycling and Waste-3).

¹ The U.S EPA has developed the SmartWay truck and trailer certification program to set voluntary standards for trucks and trailers that exhibit the highest fuel efficiency and emissions reductions. These tractors and trailers are outfitted at point of sale or retrofitted with equipment that significantly reduces fuel use and emissions including idle reduction technologies, improved aerodynamics, automatic tire inflation systems, advanced lubricants, advanced powertrain technologies, and low rolling resistance tires.

In addition, other efforts by the California Air Resources Board would reduce air pollutant emissions through 2020, including the Diesel Risk Reduction Plan (2000) and the 2007 State Implementation Plan. Measures in these plans would result in the accelerated phase-in of cleaner technology for virtually all of California's diesel engine fleets including trucks, buses, construction equipment, and cargo handling equipment at ports.

While the construction activities associated with implementation of Biological Objectives would result in small and short-term greenhouse gas production, compliance with Biological Objectives is expected to result in a net improvement through the reduction of greenhouse gas emissions. The construction of certain structural BMPs, such as low impact development techniques, will reduce greenhouse gas emissions and improve local air quality (USEPA 2012c,d), as ancillary benefits for improving discharge water quality for the implementation of Biological Objectives. In addition, habitat restoration will reduce greenhouse gas emissions, and habitat restoration projects are already in place whose purpose is focused on greenhouse gases. For example, the California Climate Investments Forest Health Grant Program funds projects that proactively restore forest health to reduce greenhouse gases, protect upper watersheds where the state's water supply originates, promote the long-term storage of carbon in forest trees and soils, minimize the loss of forest carbon from large, intense wildfires, and further the goals of the California Global Warming Solutions Act of 2006 (AB 32).

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts related to greenhouse gas emissions have occurred or will occur under the existing criteria and this baseline condition will not change with the adoption Biological Objectives. Slight increases in vehicle trips for non-structural BMPs, as well as monitoring and assessment, are not expected to be on a scale large enough that would result in the significant generation of greenhouse gases.

With the incorporation of BMPs and compliance with any plans, amendments, or regulations adopted for the purpose of reducing greenhouse gas emissions, projects undertaken to comply with Biological Objectives would not have a significant impact on the environment. Compliance methods that include low impact development BMPs and habitat restoration are expected to reduce greenhouse gases and have a net positive benefit.

Section 8. Hazards & Hazardous Materials. Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?				X
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			X	
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			X	

DISCUSSION

Hazards and hazardous materials are located throughout the developed portion of the State either as naturally occurring or man-made hazards. Contaminated soil and groundwater from commercial and industrial sites such as gas stations, dry cleaners, and manufacturing facilities are located throughout the State. Aboveground and underground storage tanks contain vast quantities of hazardous substances. Thousands of these tanks have leaked or are leaking, discharging petroleum fuels, solvents, and other hazardous substances into the subsurface. These leaks as well as other discharges to the subsurface that result from inadequate handling, storage, and disposal practices can seep into the subsurface and pollute soils and groundwater.

During the installation of treatment and structural BMPs for implementation of the reasonably foreseeable methods of compliance with Biological Objectives, it is possible that both naturally occurring hazards and anthropogenic contaminated soils and groundwater may be encountered. Any such encounters would require site-specific mitigation measures to implement BMPs to prevent contamination of surface and ground water and to remove hazardous materials where possible. In any areas where natural hazards or contaminated soils or groundwater is anticipated or discovered local planning agencies require proper mitigation measures including erosion control measures and the proper removal and disposal of contaminated soils.

It is not reasonably foreseeable that and methods of compliance would result in a safety hazard for any airport, private airstrip, physically interfere with emergency response or evacuation, or expose people or structures to wildfires.

For implementation of monitoring and assessment for Biological Objectives, current monitoring requires the use of very small quantities of potentially hazardous materials for water quality testing and organismal preservation. The volume and applied use of hazardous materials for testing and as preservation for required monitoring activities at a sampling site is not at a scale to pose a significant hazard to the public or environment. Furthermore, existing State of California Standard Operating Procedures that include the use of such chemicals in monitoring are already required and in use. Some of these materials may be considered flammable hazardous materials, and may be used in wildlands areas. The volume and use of hazardous materials as preservation for required monitoring activities at a sampling site is not at a scale to pose a potentially significant exposure or structure risk from fire.

Mitigation

Biological Objectives should bring no change to the physical environment related to hazards and hazardous materials, either directly or indirectly and would have no impact related to hazards, hazardous materials, or public health. In the extremely unlikely event of work around hazardous waste site, measures can be applied, however, to reduce and/or eliminate these impacts and are within the responsibility and jurisdiction of the responsible agencies subject to Biological Objectives and can or should be adopted by them (CCR, tit. 14, § 15091(a)(2)). For monitoring and assessment, volumes of hazardous materials from additional sampling sites are not expected to be used at a scale or duration that would result in a potentially significant impact, and existing State of California Standard Operating Procedures are required for the handling of hazardous materials for water quality sampling (if needed) and organismal preservation.

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts related to hazards or hazardous materials have occurred or will occur under the existing criteria and this baseline condition will not change with the adoption of Biological Objectives.

Staff has determined that there are no reasonably foreseeable methods of compliance that would use or produce hazardous waste at significant levels, or that would generate hazardous conditions, at a scale or in locations that would result in potentially significant impacts. Therefore, staff determined that potential impacts from hazards or hazardous materials due to implementation of Biological Objectives should be less than significant or insignificant and have no impact.

Section 9. **Hydrology / Water Quality.** Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?				X
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?			X	
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?			X	
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?				X
f) Otherwise substantially degrade water quality?				X
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			X	
j) Inundation by seiche, tsunami, or mudflow?			X	

DISCUSSION

Biological Objectives are intended to improve water quality through the prevention and/or reduction of pollutants in discharges to surface water(s). Biological Objectives would not violate any water quality standards or waste discharge requirements and such standards and waste discharge requirements are the statutory responsibility of the Water Board. Several reasonably foreseeable methods of compliance may have the potential to cause localized flooding if they are not properly planned or constructed on a site-specific project basis. However, such projects are subject to Water Board and other agency review and approval through existing regulatory authorities and would have a less than significant impact. The review and approval process would ensure that the projects are designed in such a way that they will not contribute to flooding risk. Compliance Therefore, Biological Objectives would not result in potential significant impacts related to flooding or drainage systems.

Compliance with Biological Objectives would not place housing or other structures within a 100-year flood hazard area, nor would it expose structures to a significant risk of loss, injury, or death by flooding, seiche, tsunami, or mudflow. a) Monitoring and assessment activities may occur in receiving waters that include reservoirs or waters downstream of existing dams and/or in areas subject to inundation. However, the timing, scale, and duration of such activities would not expose or require exposure of people conducting the activities to potentially significant risk. In addition, mitigation measures are included duration sampling to prevent risk of injury or death, and sampling may be postponed to avoid such risks.

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts related to hydrology or water quality have occurred or will occur under existing criteria and this baseline condition will not change with the adoption of the Biological Objectives. Instead, continued implementation and compliance will improve hydrologic and water quality condition.

Installation and maintenance of some structural compliance measures could result in less than significant environmental effects with regard to hydrology. Measures, however, can be applied to reduce and/or eliminate these impacts. These measures are within the responsibility and jurisdiction of the Water Board or responsible agencies subject to the Biological Objectives and can or should be adopted by them (CCR, tit. 14, § 15091(a)(2)). Monitoring and assessment activities in surface waters could result in less than significant impacts associated with exposure of sampling crews to flooding or inundation, though these are less than significant due to timing, duration, and scale of such implementation measures.

Section 10. **Land Use / Planning**. Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

DISCUSSION

Impacts and Mitigation

Biological Objectives would not divide an established community, conflict with any land use planning, nor conflict with conservation plans.

Monitoring and assessment activities would provide additional information on water quality and beneficial use attainment for agencies to use when determining if environmental effects occur and for documenting mitigation of those effects. Monitoring and assessment activities would also provide additional information on water quality and beneficial use attainment for properties within an applicable habitat conservation plan or natural community conservation plan.

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts related to land use and planning have occurred or will occur under the existing criteria and this baseline condition will not change with the adoption of Biological Objectives.

Implementation of Biological Objectives will not further impact any land use planning.

Section 11. **Mineral Resources.** Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?				X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

DISCUSSION

Impacts and Mitigation

Biological Objectives would not have a substantial impact on the availability of mineral resources. Minor construction activities associated with compliance will occur in areas already developed or within actively zoned anthropogenic use. Monitoring and assessment activities would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State or would not result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts related to land use and planning have occurred or will occur under the existing criteria and this baseline condition will not change with the adoption of Biological Objectives.

Implementation of Biological Objectives will not further impact any mineral resources.

Section 12. **Noise.** Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?				X
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?				X
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

DISCUSSION

Background

Noise

California Health and Safety Code section 46022 defines noise as “excessive undesirable sound, including that produced by persons, pets and livestock, industrial equipment, construction, motor vehicles, boats, aircraft, home appliances, electric motors, combustion engines, and any other noise-producing objects”. The degree to which noise can affect the human environment range from levels that interfere with speech and sleep (annoyance and nuisance) to levels that cause adverse health effects (hearing loss and psychological effects). Human response to noise is subjective and can vary greatly from person to person. Factors that influence individual response include the intensity, frequency, and pattern of noise; the amount of background noise present before the intruding noise; and the nature of work or human activity that is exposed to the noise source.

Sound results from small and rapid changes in atmospheric pressure. These cyclical changes in pressure propagate through the atmosphere and are often referred to as sound waves. The greater the amount of variation in atmospheric pressure (amplitude) leads to a greater loudness (sound level). Sound levels are most often measured on a logarithmic scale of decibels (dB). The decibel scale compresses the audible acoustic pressure levels which can vary from 20 micropascals (μPa), the threshold of hearing and reference pressure (0 dB), to 20 million μPa , the threshold of pain (120 dB).

Table 3. Common Sound Levels (Source: City of San Diego General Plan Environmental Impact Report 2007)

Sound Level (dBA)	Outdoor Sound Levels	Indoor Sound Level
110		Rock Band
100	Jet Over-flight at 300 m	
90	Gas Lawn Mower at 1 m	
90		Shop Tools in Use
80	Diesel Truck at 15 m	Garbage Disposal at 1 m
70	Noisy Urban Area (daytime)	
70	Gas Lawn Mower at 30 m	Vacuum Cleaner at 3 m
60	Suburban Commercial Area	Normal Speech at 1 m
50	Quiet Urban Area (daytime)	Quiet Conversation at 1 m
50		Dishwasher in Adjacent Room
40	Quiet Urban Area (nighttime)	Theatre
30	Quiet Suburb (nighttime)	Library
20	Quiet Rural Area (nighttime)	Empty Concert Hall
20	Rustling Leaves	
10		Broadcast and Recording Studios
0	Reference Pressure Level	Threshold of Hearing

Source: City of San Diego General Plan Environmental Impact Report 2007

To determine ambient (existing) noise levels, noise measurements are usually taken using various noise descriptors. The following are brief definitions of typical noise measurements:

Community Noise Equivalent Level

The community noise equivalent level is an average sound level during a 24-hour day. The community noise equivalent level noise measurement scale accounts for noise source, distance, single-event duration, single-event occurrence, frequency, and time of day. Humans react to sound between 7:00 p.m. and 10:00 p.m. as if the sound were actually 5 decibels higher than if it occurred from 7:00 a.m. to 7:00 p.m. From 10:00 p.m. to 7:00 a.m., humans perceive sound as if it were 10 dBA higher than if it occurred from 7:00 a.m. to 7:00 p.m. due to the lower background noise level. Hence, the community noise equivalent level noise measurement scale is obtained by adding an additional 5 decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m., and 10 dBA to sound levels in the night after 10:00 p.m. and before 7:00 a.m. Because community noise equivalent level accounts for human sensitivity to sound, the community noise equivalent level 24-hour figure is always a higher number than the actual 24-hour average.

Equivalent Noise Level

Equivalent noise level is the average noise level on an energy basis for any specific time period. The equivalent noise level for 1 hour is the energy average noise level during the hour. The average noise level is based on the energy content (acoustic energy) of the sound. Equivalent noise level can be thought of as the level of a continuous noise that has the same energy content as the fluctuating noise level. The equivalent noise level is expressed in units of dBA.

Sound Exposure Level

Sound exposure level is a measure of the cumulative sound energy of a single event. This means that louder events have greater sound exposure level than quieter events. Additionally, events that last longer have greater sound exposure level than shorter events.

Audible Noise Changes

Studies have shown that the smallest perceptible change in sound level for a person with normal hearing sensitivity is approximately 3 decibels. A change of at least 5 decibels would be noticeable and likely would evoke a community reaction. A 10-decibel increase is subjectively heard as a doubling in loudness and would most certainly cause a community response. Noise levels decrease as the distance from the noise source to the receiver increases. Noise generated by a stationary noise source, or “point source,” would decrease by approximately 6 decibels over hard surfaces and 9 decibels over soft surfaces for each doubling of the distance. For example, if a noise source produces a noise level of 89 dBA at a reference distance of 50 feet, then the noise level would be 83 dBA at a distance of 100 feet from the noise source, 77 dBA at a distance of 200 feet, and so on over hard surfaces. Generally, noise is most audible when traveling along direct line-of-sight. Barriers, such as walls, berms, or buildings that break the line-of-sight between the source and the receiver greatly reduce noise levels from the source because sound can reach the receiver only by bending over the top of the barrier (diffraction). Sound barriers can reduce sound levels by up to 20 dBA. If a barrier, however, is not high or long enough to break the line-of-sight from the source to the receiver, its effectiveness is greatly reduced.

Sensitive Receptors

Land uses that are considered sensitive to noise impacts are referred to as “sensitive receptors.” Noise-sensitive receptors consist of, but are not limited to, schools, religious institutions, residences, libraries, parks, hospitals, and other care facilities.

Vibration

In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of groundborne vibration are trains, buses on rough roads, and construction activities such as blasting, pile-driving and operating heavy earth-moving equipment. The effects of ground-borne vibration include feeling movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. A vibration level that causes annoyance would be well below the damage threshold for normal buildings.

The background vibration velocity level in residential areas is usually 50 VdB or lower, well below the threshold of perception for humans which is around 65 VdB. Most perceptible indoor vibration is caused by sources within buildings such as operation of mechanical equipment, movement of people or slamming of doors. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, trains with steel wheels, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible. The range of interest is from approximately 50 VdB to 100 VdB. Background vibration is usually well below the threshold of human perception and is of concern only when the vibration affects very sensitive manufacturing or research equipment. Electron microscopes and high-resolution lithography equipment are typical of equipment that is highly sensitive to vibration.

General Setting

Noise

Existing noise environments will vary considerably based on the diversity of land uses and densities. In urban environments automobile, truck, and bus traffic is the major source of noise. Traffic generally produces background sound levels that remain fairly constant with time. Individual high-noise-level events that can occur from time to time include honking horns, sirens, operation of construction equipment, and travel of noisy vehicles like trucks or buses. Air and rail traffic and commercial and industrial activities are also major sources of noise in some areas. In addition, air conditioning and ventilating systems contribute to the noise levels in residential areas, particularly during the summer months.

In rural and undeveloped areas air traffic, off-road vehicles, and the operation of agricultural and industrial machinery are major sources of noise. Construction activities can also produce noise in these areas.

Regulatory Framework

The no longer extant California Office of Noise Control, California Department of Health Services developed guidelines showing a range of noise standards for various land use categories in the 1976 Noise Element Guidelines. These guidelines are now found in Appendix C of the State of California General Plan Guidelines (2003). Cities within the state have generally incorporated this compatibility matrix into their General Plan noise elements. These guidelines are meant to maintain acceptable noise levels in a community setting based on the type of land use. Noise compatibility by different types of land uses is a range from “Normally Acceptable” to “Clearly Unacceptable” levels. The guidelines are used by cities within the state to help determine the appropriate land uses that could be located within an existing or anticipated ambient noise level.

Some of the reasonably foreseeable methods of compliance have the potential to affect noise levels. Noise within counties and cities are regulated by noise ordinances, which are found in the municipal code of the jurisdiction. These noise ordinances limit intrusive noise and establish sound measurements and criteria, minimum ambient noise levels for different land use zoning classifications, sound emission levels for specific uses, hours of operation for certain activities (such as construction projects), standards for determining noise deemed a disturbance of the peace, and legal remedies for violations.

Vibration

Major sources of groundborne vibration would typically include trucks and buses operating on surface streets, and freight and passenger train operations. The most significant sources of construction-induced groundborne vibrations are pile driving and blasting – neither of which would be involved in reasonably foreseeable compliance activities for Biological Objectives. Currently, the state of California has no vibration regulations or guidelines.

Impacts and Mitigation

Implementation of Biological Objectives would not cause a permanent increase in ambient noise levels. Construction, maintenance, and monitoring and assessment activities would be temporary and intermittent in nature. The remaining thresholds may be exceeded for limited durations depending on the location and ambient noise levels at sites selected.

Increases in noise levels during construction activities associated with Biological Objectives implementation would vary depending on the existing ambient noise levels at each site. Once a site has been selected, project-level analysis to determine noise impacts would involve: (i) identifying sensitive receptors within a quarter-mile vicinity of the site, (ii) characterizing existing ambient noise levels at these sensitive receptors, (iii) determining noise levels of any and all installation and maintenance equipment, and (iv) adjusting values for distance between noise source and sensitive receptor. In addition, the potential for increased noise levels due to construction activities is limited and short-term. Given the size of the individual projects and the fact that treatment facilities and structural BMPs would occur in small discrete locations, noise impacts during installation would not foreseeably be greater, and would likely be less onerous than, other types of typical construction activities in urbanized and rural areas, such as ordinary road and infrastructure maintenance activities, building activities, etc. These short-term noise impacts can be mitigated by implementing commonly-used noise abatement procedures, standard construction techniques such as sound barriers, mufflers and employing restricted hours of operation. Applicable and appropriate mitigation measures could be evaluated when specific projects are determined, depending upon proximity of construction activities to receptors.

Increased noise levels during monitoring and assessment activities are expected in areas that are largely rural or undeveloped. Noise production would be associated with vehicular access to such areas (e.g. car or boat), and the noise produced by the presence of human voices. The noise produced by monitoring and assessment activities in such areas would be no greater than that produced through normal recreational use access.

Overall, noise levels for minor construction associated with several of the reasonably foreseeable methods of compliance are governed primarily by the noisiest pieces of equipment. For most construction equipment the engine is the dominant noise source. Typical maximum noise emission levels (L_{max}) are summarized, based on construction equipment operating at full power at a reference distance of 50 feet, and an estimated equipment usage factor based on experience with other similar installation projects. The usage factor is a fraction that accounts for the total time during an eight-hour day in which a piece of installation equipment is producing noise under full power. Although the noise levels in Table 4 represent typical values, there can be wide fluctuations in the noise emissions of similar equipment based on two important factors: (1) the operating condition of the equipment (e.g., age, presence of mufflers and engine cowlings); and (2) the technique used by the equipment operator (aggressive vs. conservative).

Table 4. Noise Emission Levels for Typical Installation Equipment (Source: State Water Board 2015)

Equipment	Maximum Noise Level, (dBA) 50 feet from source	Equipment Usage Factor	Total 8-hr Leq exposure (dBA) at various distances	
Foundation Installation			50 ft	100 ft
Foundation Installation			83	77
Concrete Truck	82	0.25	76	70
Front Loader	80	0.3	75	69
Dump Truck	71	0.25	65	59
Generator to vibrate concrete	82	0.15	74	68
Vibratory Hammer	86	0.25	80	74
Equipment Installation			83	77
Flatbed Truck	78	0.15	70	64
Forklift	80	0.27	74	69
Large Crane	85	0.5	82	76

Contractors and equipment manufacturers have been addressing noise problems for many years, and through design improvements, technological advances, and a better understanding of how to minimize exposures to noise, noise effects can be minimized. An operations plan for the specific construction and/or maintenance activities could be developed to address the variety of available measures to limit the impacts from noise to adjacent homes and businesses. To minimize noise and vibration impacts at nearby sensitive sites, installation activities should be conducted during daytime hours to the extent feasible. There are a number of measures that can be taken to reduce intrusion without placing unreasonable constraints on the installation process or substantially increasing costs. These include noise and vibration monitoring to ensure that contractors take all reasonable steps to minimize impacts when near sensitive areas; noise testing and inspections of equipment to ensure that all equipment on the site is in good condition and effectively muffled; and an active community liaison program. A community liaison program should keep residents informed about installation plans so they can plan around noise or vibration impacts; it should also provide a conduit for residents to express any concerns or complaints.

The following measures would minimize noise and vibration disturbances at sensitive areas during installation:

- Use newer equipment with improved noise muffling and ensure that all equipment items have the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators intact and operational. Newer equipment will generally be quieter in operation than older equipment. All installation equipment should be inspected at periodic intervals to ensure proper maintenance and presence of noise control devices (e.g., mufflers and shrouding).
- Perform all installation in a manner to minimize noise and vibration. Use installation methods or equipment that will provide the lowest level of noise and ground vibration impact near residences and consider alternative methods that are also suitable for the soil condition. The contractor should select installation processes and techniques that create the lowest noise levels.
- Perform noise and vibration monitoring to demonstrate compliance with the noise limits. Independent monitoring should be performed to check compliance in particularly sensitive areas. Require contractors to modify and/or reschedule their installation activities if monitoring determines that maximum limits are exceeded at residential land uses.
- Conduct truck loading, unloading and hauling operations so that noise and vibration are kept to a minimum by carefully selecting routes to avoid going through residential neighborhoods to the greatest possible extent. Ingress and egress to and from the staging area should be on collector streets or higher street designations (preferred).
- Turn off idling equipment.
- Temporary noise barriers shall be used and relocated, as practicable, to protect sensitive receptors against excessive noise from installation activities. Consider mitigation measures such as partial enclosures around continuously operating equipment or temporary barriers along installation boundaries.
- The installation contractor should be required by contract specification to comply with all local noise and vibration ordinances and obtain all necessary permits and variances.

These and other measures can be classified into three distinct approaches as outlined in Table 5.

Table 5. Noise Abatement Measures (Source: State Water Board 2015)

Type of Control	Description
Source Control	<i>Time Constraints</i> – Prohibiting work during sensitive nighttime hours <i>Scheduling</i> – performing noisy work during less sensitive time periods <i>Equipment Restrictions</i> – restricting the type of equipment used <i>Substitute Methods</i> –using quieter equipment when possible <i>Exhaust Mufflers</i> – ensuring equipment have quality mufflers installed <i>Lubrication and Maintenance</i> – well maintained equipment is quieter <i>Reduced Power Operation</i> – use only necessary power and size <i>Limit equipment on-site</i> – only have necessary equipment onsite <i>Noise Compliance Monitoring</i> – technician on-site to ensure compliance
Path Control	<i>Noise barriers</i> – semi-portable or portable concrete or wooden barriers <i>Noise curtains</i> – flexible intervening curtain systems hung from supports <i>Increased distance</i> – perform noisy activities further away from receptors
Receptor Control	<i>Community participation</i> –open dialog to involve affected parties <i>Noise complaint process</i> – ability to log and respond to noise complaints

Increases in ambient noise levels are expected to be less than significant and measures are available to further reduce any less than significant impacts.

7.3.12.2 Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts related to noise or vibration have occurred or will occur under existing criteria and this baseline condition will not change with the adoption of Biological Objectives.

Construction activities could result in temporary environmental effects with regard to noise. However, these are site-specific and expected to be less than significant. Measures, are available that can be applied to reduce and/or eliminate these impacts as described above. These mitigation measures are within the responsibility and jurisdiction of the responsible agencies subject to Biological Objectives and can or should be adopted by them (CCR, tit. 14, § 15091(a)(2)). The San Diego Water Board does not direct which compliance measures responsible agencies choose to adopt or the mitigation measures they employ. The San Diego Water Board does, however, recommend that appropriate measures be applied to reduced or avoid potential environmental impacts.

13. Population / Housing. Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

DISCUSSION

Impacts and Mitigation

It is not reasonably foreseeable that Biological Objectives would induce population growth, affect housing, or displace persons.

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts related to population or housing have occurred or will occur under existing criteria and this baseline condition will not change with the adoption of Biological Objectives. Implementation of Biological Objectives is expected to have no impacts on population or housing.

Section 14. **Public Services.** Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				X
Fire Protection?				X
Police Protection?				X
Schools?				X
Parks?				X
Other public facilities?				X

DISCUSSION

Impacts and Mitigation

Reasonably foreseeable methods of compliance for Biological Objectives do not involve the creation of infrastructure or housing that would require the provision of new or physically altered public facilities. However, response times for fire and/or police protection may be temporarily impacted during minor construction activities, depending on where and when they occur.

There is potential for temporary delays in response times of fire and police vehicles due to road closure/traffic congestion during construction activities. However, construction activities for reasonable methods of compliance could feasibly be timed to coincide with regularly scheduled construction activities related to maintenance or repairs of existing facilities (e.g. water line replacement). To mitigate potential delays the responsible agencies could notify local emergency and police service providers of construction activities and road closures, if any, and coordinate with the local fire and police providers to establish alternative routes and traffic control during the construction activities. Most jurisdictions have in place established procedures to ensure safe passage of emergency and police vehicles during periods of road maintenance, construction, or other attention to physical infrastructure, and there is no evidence to suggest that installation of these structural devices would create any more significant impediments than other such typical activities. Any construction activity would be subject to applicable building and safety codes and permits. Therefore, the potential delays in response times for fire and police vehicles after mitigation are less than significant.

Since construction activities would not result in development of land uses for residential, commercial, and/or industrial uses nor would the compliance measures result in an increase of growth, it is reasonably foreseeable that the compliance measures would not result in a need for new or altered fire or police protection services. In addition, Emergency Preparedness Plans could be developed in consultation with local emergency providers to ensure that the structural compliance measures would not contribute to an increase in the cumulative demand for fire and police emergency services.

Once structural compliance measures are installed and operating, maintenance and monitoring would be required to verify that the treatment technologies and/or structural BMP(s) are performing properly and as expected. This maintenance and monitoring may, depending on the site-specific nature of the project, also cause road closures and/or traffic congestion, but the same measures can be implemented as those for installation of the structures, and are expected to be of a shorter duration than construction.

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts related to public services have occurred or will occur under existing criteria and this baseline condition will not change with the adoption of Biological Objectives.

Installation and maintenance of structural compliance measures could result in environmental effects with regard to public service response times. Measures, however, can be applied to reduce and/or eliminate any potential impacts, as described above. These mitigation measures are within the responsibility and jurisdiction of the responsible agencies subject to Biological Objectives and can or should be adopted by them. The San Diego Water Board does not direct which compliance measures responsible agencies choose to adopt or the mitigation measures they employ. The San Diego Water Board does, however, recommend that appropriate measures be applied to reduced or avoid potential environmental impacts.

Section 15. **Recreation.** Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

DISCUSSION

Impacts and Mitigation

Biological Objectives would not have a substantial impact on recreation. Compliance with Biological Objectives would result in improved recreation through the reduction and/or prevention of pollutants in discharges to receiving waters within recreational areas. It is not reasonably foreseeable that park land, recreational, or open space areas will be needed for the installation of technological treatment methods and/or structural controls.

Minor construction activities may temporarily impact the usage of existing recreational sites. For instance, bike lanes, trails, or parking locations for recreational facilities may be temporarily unavailable during installation or maintenance of structural control BMPs or during habitat restoration. These potential impacts will be short in duration and have a less-than-significant effect on recreation. Monitoring and assessment activities may occur in recreational areas but should not have an impact on recreation.

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts related to recreation have occurred or will occur under existing criteria and this baseline condition will not change with the adoption of Biological Objectives. Implementation of Biological Objectives is expected to have no impacts on recreation.

In addition, implementation of Biological Objectives is expected to improve the quality of the surface waters throughout the San Diego Region. This will likely create a positive impact and increase recreational opportunities throughout the watersheds.

Section 16. **Transportation/Traffic.** Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?				X
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?				X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
e) Result in inadequate emergency access?			X	
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				X

DISCUSSION

Impacts and Mitigation

Implementation of Biological Objectives would not result in a change in air traffic patterns nor substantially increase hazards due to design features. Biological Objectives do not conflict with any policies, plans or programs, including those supporting alternative transportation, nor would they result in inadequate emergency access to sites or facilities.

To the extent that site-specific projects entail minor construction in roadways, such excavations should be marked, barricaded, and traffic flow controlled with signals or traffic control personnel in compliance with authorized local police or California Highway Patrol requirements. These methods would be selected and implemented by responsible local agencies considering project level concerns. Standard safety measures should be employed including fencing, other physical safety structures, signage, and other physical impediments designed to promote safety and minimize pedestrian/bicyclists accidents. It is not foreseeable that this proposal would result in significant increases in traffic hazards to motor vehicles, bicyclists or pedestrians.

In order to reduce the impact of construction traffic, implementation of a construction management plan for specified facilities could be developed to minimize traffic impacts upon the local circulation system, depending on the magnitude and scale of the project. A construction traffic management plan could address traffic control for any street closure, detour, or other disruption to traffic circulation. The plan could identify the routes that construction vehicles would use to access the site, hours of construction traffic, and traffic controls and detours. The plan could also include plans for temporary traffic control, temporary signage, location points for ingress and egress of construction vehicles, staging areas, and timing of construction activity which appropriately limits hours during which large construction equipment may be brought on or off site. Potential impacts could also be reduced by limiting or restricting hours of construction so as to avoid peak traffic times and by providing temporary traffic signals and flagging to facilitate traffic movement.

There is potential for temporary delays in response times of fire and police vehicles due to road closure/traffic congestion during construction activities. However, these are expected to be less than significant and would not result in inadequate emergency access to sites or facilities. To mitigate potential delays the responsible agencies could notify local emergency and police service providers of construction activities and road closures, if any, and coordinate with the local fire and police providers to establish alternative routes and traffic control during the construction activities. Most jurisdictions have in place established procedures to ensure safe passage of emergency and police vehicles during periods of road maintenance, construction, or other attention to physical infrastructure, and there is no evidence to suggest that installation of these structural devices would create any more significant impediments than other such typical activities. Any construction activity would be subject to applicable building and safety codes and permits.

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts related to transportation/traffic have occurred or will occur under the existing criteria and this baseline condition will not change with the adoption of Biological Objectives.

Minor construction and maintenance of structural compliance measures could result in environmental effects with regard to transportation/traffic. Measures, however, can be applied to reduce and/or eliminate any potential impacts, as described above. These mitigation measures are within the responsibility and jurisdiction of the responsible agencies subject to Biological Objectives and can or should be adopted by them (CCR, tit. 14, § 15091(a)(2)). The San Diego Water Board does not direct which compliance measures responsible agencies choose to adopt or the mitigation measures they employ. The San Diego Board does, however, recommend that appropriate measures be applied to reduced or avoid potential environmental impacts

Section 17. Tribal Cultural Resources. Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				X
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or				X
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe				X

DISCUSSION:

Tribal Cultural Resources

AB 52 (Gatto, 2014) established a new category of resources in CEQA called Tribal Cultural Resources. (PRC, § 21074.) “Tribal cultural resources’ are either of the following: (1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following: (A) Included or determined to be eligible for inclusion in the California Register of Historical Resources. (B) Included in a local register of historical resources as defined in subdivision (k) of section 5020.1. (2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of section 5024.1. In applying the criteria set forth in subdivision (c) of section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.” (Ibid.) Consultation with a California Native American Tribe that has requested such consultation may assist a lead agency in determining whether the project may adversely affect tribal cultural resources, and if so, how such effects may be avoided or mitigated. Whether or not consultation has been requested (no such consultation was requested for the San Diego Water Board’s Biological Objectives), the lead agency evaluates whether the project may cause a substantial adverse change in a site, feature, place, cultural landscape, sacred place, or object, with cultural value to a California Native American Tribe.

Impacts and Mitigation

This is a San Diego Region level analysis of the potential impacts from Biological Objectives. The specific location of potential impacts would be determined during the implementation of Biological Objectives.

Compliance projects may include focused or modified maintenance or upgrades to treatment technologies and/or Best Management Practices in priority locations, and/or additional monitoring and reporting. Construction related activities would mostly occur in existing developed and regulated site areas where ground disturbance has previously occurred, or within previously disturbed waters of the State. Because these areas are already disturbed, it is unlikely that construction activities would cause a substantial adverse change to tribal cultural resources. However, potential impacts to tribal cultural resources could occur from construction related activities depending on unique site-specific conditions. The site-specific presence or absence of these resources is unknown because the specific locations for compliance measures would be determined by responsible agencies at the project level. Construction activities could result in minor ground disturbances, which could impact tribal cultural resources if they are sited in locations containing these resources and where disturbances have not previously occurred. However, this is not reasonably expected to occur. Monitoring and assessment activities, as well as the addition of non-structural BMPs, are not expected to result in substantial adverse change in the significance of a tribal cultural resource site, feature, place, or cultural landscape as defined in PRC section 21074, 5020.1(k), or 5024.1. These activities are not expected to result in potentially significant impacts due to their lack of ground disturbance, as well as the scale and duration of such activities.

Upon determination of specific locations where construction activities will occur, responsible agencies should complete further investigation, including consultation with Native American tribes, to make an accurate assessment of the potential to affect tribal cultural resources. If potential impacts are identified, measures to reduce impact could include project redesign, such as the relocation of facilities outside the boundaries of archeological or historical sites. According to the California Office of Historic Preservation, avoidance and preservation in place are the preferable forms of mitigation for archeological sites. When avoidance is infeasible, a data recovery plan should be prepared which adequately provides for recovering scientifically consequential information from the site. Studies and reports resulting from excavations must be deposited with the California Historical Resources Regional Information Center. No potentially significant impact is anticipated after these measures are taken.

Summary

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts to tribal cultural resources have occurred or will occur under the existing criteria and this baseline condition will not change with the adoption of Biological Objectives.

While the potential for adverse impacts to cultural resources is very low, there still exists a chance that cultural resources may occur at specific locations where related project compliance occurs. Measures can be identified that could reduce potential impacts to less than significant levels and should be incorporated into site-specific projects carried out by a local agency (CCR, tit. 14, § 15091(a)(2)).

Section 18. Utilities / Service Systems. Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				X
g) Comply with federal, state, and local statutes and regulations related to solid waste?				X

DISCUSSION

Impacts and Mitigation

Reasonably foreseeable methods of compliance with Biological Objectives would not result in the need for a new or substantial alteration to water supply utilities, exceed wastewater treatment requirements, or require the construction or expansion of wastewater treatment facilities that would result in significant environmental effects. The implementation of Biological Objectives would not result in the development of any large residential, retail, industrial or any other development projects that would significantly increase the demand on the current water supply facilities, require new water supply facilities, require new wastewater treatment facilities or expansion of current wastewater facilities. There would be no impacts related to water supply and no mitigation is required.

Implementation of Biological Objectives would not result in the need for new, nor expansion of, existing wastewater treatment plants.

Implementation of Biological Objectives would not result in the generation of significant amounts of solid waste.

Reasonably foreseeable methods of compliance include the construction of focused structural treatment technologies and/or BMPs for existing treatment facilities and storm water systems in priority locations. These compliance measures are designed to prevent and/or reduce pollutants from being discharged into streams and other surface waters. Construction of these structural projects and facilities should be of a short duration and should have less than significant impacts, especially if they are conducted during the dry season. Potential impacts related to construction activities are discussed above in previous sections.

Section 19. **Mandatory Findings of Significance.** Would the project:

Issues (and Supporting Information Sources)	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?				X
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?				X

DISCUSSION

Reasonably foreseeable methods of compliance for Biological Objectives are not expected to be of the size, scale, or in locations that could degrade the environment or result in significant changes that could have a substantial adverse effect on native plant and animal species, and existing agency requirements include avoidance and mitigation measures to reduce any impacts to less than significant levels. The project is intended to improve the overall condition of the environment, including the presence of and habitat for wildlife species and populations in the San Diego Region. In-stream restoration activities could result in potential impacts though the Water Boards have jurisdiction to require avoidance and mitigation measures to ensure impacts from such activities are less than significant.

Adoption of Biological Objectives will not cause any change in the type of the compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat for existing or proposed criteria. Any potential impacts have occurred or will occur under existing water quality criteria and this baseline condition will not change with the adoption of Biological Objectives. Biological Objectives are expected to provide clarity in the implementation of compliance measures to meet existing Beneficial Uses, thus reducing potential impacts associated with unnecessary compliance measures.

Cumulative impacts, defined in section 15355 of the CEQA Guidelines, refer to two or more individual effects, that when considered together, are considerable or that increase other environmental impacts. Cumulative impact assessment must consider not only the potential impacts associated with implementing projects to comply with the Basin Plan amendment, but also the impacts from other Basin Plan amendment, municipal, and private projects, which have occurred in the past, are presently occurring, and may occur in the future, during the period of implementation.

The adoption of Biological Objectives will not cause any change in the type of compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat. Biological Objectives will be used to guide the implementation of current compliance methods to protect and restore aquatic-life beneficial uses. Any potential impacts associated with reasonably foreseeable methods of compliance have occurred or will occur under existing water quality criteria and this baseline condition will not change with the adoption of Biological Objectives. Existing compliance would continue under the project and may result in short-term cumulative impacts. However, these activities are localized, temporary, and are not of the size or scale to result in cumulative effects.

Implementation associated with compliance for Biological Objectives would not result in substantial adverse effects on human beings, either directly or indirectly. The overall effect of Biological Objectives will be to improve water quality for human beings.

Where temporary effects have been identified in this document, mitigation measures have also been identified to insure those impacts are less-than-significant.

Preliminary Staff Determination

On the basis of the initial evaluation:

X	The proposed project COULD NOT have a significant effect on the environment, and therefore, no alternatives and mitigation measures are proposed.
	The proposed project MAY have a significant or potentially significant effect on the environment, and therefore the alternatives and mitigation measures have been evaluated.

1.5.5. Significant or Potentially Significant Impacts of the Proposed Project

Adoption of Biological Objectives will not cause any change in the type of compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat. Any potential impacts have occurred or will occur under existing water quality criteria and this baseline condition will not change with the adoption of Biological Objectives. Biological Objectives are expected to provide clarity in the implementation of compliance measures to meet existing Beneficial Uses, thus reducing potential impacts associated with unnecessary compliance measures.

No significant or potentially significant environmental impacts from the proposed project were identified in the environmental checklist. The environmental checklist identified potential impacts to biological resources associated with conducting surface water biological monitoring and assessment activities. However, these are not considered potentially significant impacts as the duration, magnitude, and scope of water quality related biological monitoring does not mandate a substantial adverse effect, including for candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

In addition to the lack of substantial adverse effect, collection of biological organisms for water quality related biological assessments by statute requires the incorporation of project-specific mitigation measures via state and federal permitting requirements for organismal collection, and local requirements for access to sensitive habitats. These include obtaining a Scientific Collecting Permit from the California Department of Fish and Wildlife and take permits from state and federal wildlife management agencies for sensitive species and organismal collection in protected habitats (e.g. NOAA, USFWS, California State Parks, National Parks Service). These permits set specific mitigation measures to insure significant and potentially significant impacts do not occur as a result of sampling activities. In addition, as specified in Section 5 of the staff report, existing San Diego Water Board regulatory programs under the authority of the CWA and Porter-Cologne currently require dischargers to conduct biological assessments in surface waters in order to document that biological resources *are protected and restored*. As such, sampling agencies and entities are already required to obtain proper permissions from natural resource agencies in order to conduct the required organismal collections.

Implementation of Biological Objectives may result in the potential expansion of the number and duration of monitoring events due to the potential increase in permitted discharges required to conduct biological assessments, and the expanded duration of monitoring based on site-specific conditions and results. There would also be a potential increase in the number of structural and non-structural permit controls implemented. However, the adoption of Biological Objectives will not cause any change in the type of compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat. Any potential impacts have occurred or will occur under existing water quality criteria and this baseline condition will not change with the adoption of Biological Objectives. Biological Objectives would be used to determine the prioritization of these compliance measures as well as determine effectiveness under existing regulatory program requirements. Existing compliance would continue under the project and may result in short-term temporary impacts, those these are expected to be less than significant in addition to requiring mitigation measures under existing federal, State, and local authorities.

1.6. Analysis of Reasonably Foreseeable Environmental Impacts Associated with the Methods of Compliance

Based on the information provided in the environmental checklist, there are no reasonably foreseeable significant environmental impacts associated with the methods of compliance discussed above. Therefore, no analysis of reasonably foreseeable alternative methods of compliance or analysis of reasonably foreseeable mitigation measures are required by CEQA (*Id.* at § 3777 (f)) because they are not necessary to avoid or reduce any significant or potentially significant impacts.

1.7. Cumulative Impacts Analysis

In compliance with the requirements to prepare a draft SED and meet the substantive requirements of CEQA, this section describes the potential for Biological Objectives to cause a considerable contribution to a cumulatively significant impact. Cumulative impacts, defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects, that when considered together, are considerable or that increase other environmental impacts. The fundamental purpose of the cumulative impacts analysis is to ensure that the potential environmental impacts of any individual project are not considered in isolation. Impacts that may be individually less than significant on a project specific basis, could pose a potentially significant impact when considered with the impacts of other past, present, and probable future projects

As discussed in Environmental Effects Checklist, this SED concludes that reasonably foreseeable methods of compliance will not result in potentially significant impacts to the environment. Adoption of Biological Objectives will not cause any change in the type of compliance methods that have been or will be implemented to address discharges of pollutants or restore stream habitat. Compliance methods to address pollutant discharges and restore stream habitat are already required by the San Diego Water Board, and thus any potential impacts have occurred or will occur under existing water quality criteria. This baseline compliance condition will not change with the adoption of Biological Objectives. However, Biological Objectives are expected to provide clarity in the implementation of compliance measures to meet existing Beneficial Uses by providing the information to focus on specific pollutants causing impacts to beneficial uses, as well as incorporating considerations of site-specific habitat conditions. This is expected to better focus existing compliance measures, thus reducing potential impacts associated with the present implementation of unnecessary compliance measures.

Thus, Biological Objectives will be used to select those specific compliance measures needed to protect or restore aquatic life beneficial uses. Existing compliance methods would continue under the project and may result in short-term cumulative impacts. However, these activities are localized, temporary, and are not of the size or scale to result in cumulative impacts.

This section discusses whether Biological Objectives' incremental effect is cumulatively considerable and, where that is the case, describes the significant cumulative impacts of the proposed project in combination with past, present, and probable future projects. CEQA Guidelines direct that this cumulative impact analysis be provided through either the "list approach" or "projections approach". The cumulative impacts from implementation of Biological Objectives are discussed through analyzing the possible projects that could occur to cause impacts. This occurs in consideration of Biological Objectives in in two sections: (1) the program level cumulative impacts, and (2) the project level cumulative impacts.

On the program level, impacts from reasonably foreseeable statewide and San Diego Region water quality actions, including TMDLs, may in combination have cumulative impacts. On the project level, it is not possible to provide an environmental analysis of individual probable future projects that could occur to cause impacts that would combine with impacts of Biological Objectives. The cumulative impacts analysis entails a general consideration of construction and other project-level activities that may occur in the vicinity of implementation actions for compliance with Biological Objectives, such as additional monitoring and assessment.

1.7.1. Water Board Program-specific Cumulative Impacts Analysis

The San Diego Water Board is developing or has adopted Basin Plan amendments, including TMDLs and site-specific criteria. The State Water Board also is developing or has recently adopted State-wide policies. These are considered reasonably foreseeable probable future projects.

Project: Loma Alta Slough TMDL Alternative

Description: Endorsed by the San Diego Water Board on June 26, 2014, the Loma Alta Slough TMDL Alternative addresses the eutrophication impairment of the Loma Alta Slough through the reduction of nutrients (phosphorous is targeted) in dry weather non-storm water discharges to Loma Alta Creek and Slough within the regulatory framework of the San Diego Water Board Regional Phase I MS4 permit (Resolution R9-2014-0020).

Related Impacts: The Loma Alta Slough TMDL Alternative is implemented within the existing regulatory framework of the San Diego Water Board Regional Phase I MS4 permit. The City of Oceanside, under existing NPDES permit requirements, may choose to conduct focused non-structural BMPs (e.g. inspections) to address non-storm water flows and reduce nutrient discharges to Loma Alta Creek and Slough. Structural BMPs were not identified by the City of Oceanside as feasible during the TMDL alternative development process. There should not be considerable cumulative impacts as these activities are conducted under existing permit requirements and are expected to assist in meeting Biological Objectives by improving conditions in Loma Alta Creek.

Project: Los Penasquitos Lagoon Sediment TMDL

Description: The Los Penasquitos Lagoon Sediment TMDL was adopted by the San Diego Water Board on June 13, 2012 (Resolution R9-2012-0033), and specifies the reduction of sediment loads into, and/or habitat restoration of, the salt marsh in Los Penasquitos Lagoon to restore the beneficial uses. Methods to reduce sediment loading and restore salt marsh habitat are determined by permittees in the watershed. Actions reasonably expected to occur include non-structural BMPs (e.g. construction site inspections), structural BMPs, and habitat restoration.

Related Impacts: The implementation measures for the Los Penasquitos TMDL, and those undertaken under existing permitting requirements, are not distinct from those necessary to achieve Biological Objectives and are expected to be inclusive of efforts undertaken for implementation of Biological Objectives. Therefore, the impacts are not considered by staff to be cumulative.

Project: Indicator Bacteria Project I - Twenty Beaches and Creeks in the San Diego Region

Description: On February 10, 2010 the San Diego Water Board adopted Resolution No. R9-2010-0001, an amendment incorporating Revised Bacteria TMDLs Project I into the San Diego Basin Plan. This TMDL Basin Plan amendment was subsequently approved by the State Water Board on December 14, 2010, the Office of Administrative Law (OAL) on April 4, 2011, and the United States Environmental Protection Agency (USEPA) on June 22, 2011. Under State law, this TMDL Basin Plan Amendment became fully effective on April 4, 2011, the date of OAL approval. The TMDL requires the reduction of indicator bacteria, which impair the contact recreation (REC-1) beneficial use, at beaches and streams in the San Diego Region.

Related Impacts: The implementation of structural and non-structural BMPs to eliminate dry weather bacteria loading has largely already occurred in coastal areas and such BMPs have likely improved biological condition through direct removal of pollutants and flows (e.g. dry weather diversion structures). Continued implementation of structural and non-structural BMPs are expected to mirror those for implementation of Biological Objectives, resulting in improved biological condition for perennial and seasonal streams. For example, the identification of illegal sewer cross-connections will also eliminate ancillary pollutants from being discharged. Thus, while there is a nexus between the projects there should not be considerable cumulative impacts.

Project: Chollas Creek Copper, Lead, and Zinc TMDLs

Description: The San Diego Water Board adopted the Chollas Creek Metals TMDLs Basin Plan Amendment on June 13, 2007. These TMDLs were approved by the State Water Board through Resolution No. 2008-0054 on July 15, 2008. The State OAL approved the TMDLs on October 22, 2008 as File No. 2008-0909-01 S. USEPA approved the TMDLs on December 18, 2008. Based on the approval date from the OAL, the official commencement date for these TMDLs was October 22, 2008. On February 8, 2017, the San Diego Water Board adopted a Resolution amending the Basin Plan to incorporate site-specific water effect ratios into water quality objectives for toxic pollutants and TMDLs for copper and zinc in Chollas Creek.

Related Impacts: Compliance through the amendments will be accomplished through implementation of BMPs at industrial facilities and through the Regional Phase I MS4 permit. Implementation of structural and non-structural BMPs are expected to mirror those for implementation of Biological Objectives, resulting in improved biological condition for perennial and seasonal streams through metal reductions. Biological Objectives may be used to focus implementation measures that have a more direct impact on beneficial uses, which would result in less potential impacts for the Chollas Creek TMDLs Project implementation. Thus, while there is a nexus between the projects there should not be considerable cumulative impacts.

Project: Proposed Toxicity Amendment to the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California (Toxicity Provisions)

Description: The State Water Board anticipates amending the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries with the adoption of Toxicity Provisions in 2019. The goals of the proposed Toxicity Provisions include: (a) a new method to determine the toxicity of discharges, (b) statewide numeric objectives, and (c) further standardization of toxicity provisions for NPDES dischargers and facilities subject to WDR and conditional waivers.

Related Impacts: The proposed Toxicity Provisions could demand a higher level of treatment from wastewater and industrial dischargers. The proposed Toxicity Provisions, in combination with other projects, could prompt additional upgrades to wastewater and industrial facilities. The proposed Toxicity Provisions may also require an increase in toxicity monitoring and assessment. While there is a nexus between the projects there should not be considerable cumulative impacts as toxicity monitoring may be included as a component of Biological Objectives assessment. Improved statewide standardization should result in improved implementation and assessment for Biological Objectives and causal assessments.

Project: Proposed Amendment to Water Quality Control Plan for Ocean Waters of California – Bacteria Provisions and a Water Quality Standards Variance

Description: The State Water Board, in August 2018, adopted Part 3 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays and Estuaries of California and an amendment to the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) to incorporate Bacteria Provisions and a Water Quality Standards Variance Policy (Resolution No. 2018-0038). The Bacteria Provisions include updated water quality objectives and provisions for *Escherichia coli* (*E. coli*) and enterococci bacteria to protect human health for the beneficial use of water contact recreation (REC-1) in fresh, estuarine, and marine waters. The proposed Bacteria Provisions also include implementation elements for control of bacteria including reference system and natural sources exclusion approaches, high flow suspensions, seasonal suspensions, and a definition of the limited water contact recreation (LREC-1) beneficial use. In addition, the proposed Bacteria Provisions identify an existing mechanism for adopting water quality standards variances (WQS Variance) for pollutants and waterbodies.

The Bacteria Provisions supersede any numeric water quality objectives for bacteria for the REC-1 beneficial use in Regional Basin Plans, except for site-specific numeric water quality objectives for bacteria.

Related Impacts: The Bacteria Provisions require dischargers to limit discharges of fecal indicator bacteria and will be implemented through NPDES storm water permits, Waste Discharge Requirements (WDRs), and waivers of WDRs. The Bacteria Provisions identify cumulative project impacts regarding the potential increase in structural BMP installation within existing urbanized areas, which could have a significant cumulative impact. The implementation of structural BMPs to meet Bacteria requirements mirrors the requirements for Biological Objectives in existing permits and has the potential to decrease inputs of ancillary pollutants into receiving waters, thus providing combined compliance with Biological Objectives. While there is a nexus between the projects there should not be considerable cumulative impacts.

Project: Amendment to the Water Quality Control Plan for the Ocean Waters of California to Control Trash. Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California.

Description: The State Water Board adopted the Amendment to the Ocean Plan and Part I Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California (Trash Amendments) in April in 2015 and OAL and USEPA approved them in December 2015 and January 2016, respectively. The Trash Amendments include six elements: (1) a water quality objective, (2) applicability, (3) prohibition of discharge, (4) implementation provisions, (5) time schedule, and (6) monitoring and reporting requirements. The Trash Amendments apply to all surface waters of the State in the San Diego Region.

Related Impacts: The Trash Amendments require dischargers to limit discharges of litter and will be implemented through existing NPDES storm water permits (e.g. Phase I MS4, California Department of Transportation), WDRs, and waivers of WDRs. These requirements have the potential to improve the biological condition of receiving waters by reducing the discharge of trash and associated and ancillary pollutants. The Trash Amendments identify cumulative project impacts regarding the potential increase in nonstructural BMPs, such as vehicle use for waste collection, which could have a significant cumulative impact. While there is a nexus between the projects there should not be considerable cumulative impacts.

Project: Recycled Water Policy

Description: The State Water Board adopted the Recycled Water Policy in 2009 (revised 2013) to increase the use of recycled water from municipal wastewater sources that meet the definition in Water Code section 13050, subdivision (n), in a manner that implements State and federal water quality laws. The State Water Board is planning to consider another update to the Recycled Water Policy at its December 11, 2018, meeting. The Recycled Water Policy provides direction regarding the appropriate criteria to be used by the State and Regional Water Boards in issuing permits for recycled water projects. Additionally, the Recycled Water Policy encourages every region in California to develop a salt/nutrient management plan by 2014 that is sustainable on a long-term basis and that provides California with clean, abundant water. The San Diego Water Board has endorsed [guidelines](#) to assist regional water purveyors and stakeholders with the preparation of Salt and Nutrient Management Plans in the San Diego Region.

Related Impacts: The Recycled Water Policy could demand a higher level of wastewater treatment from wastewater and/or industrial dischargers, so that the water may be reused. The Recycled Water Policy, in combination with other projects, could prompt additional upgrades to wastewater and industrial facilities. However, this re-use would likely result in reductions in discharges to receiving waters and restoration of groundwater basins. While there is a nexus between the projects there should not be considerable cumulative impacts.

Project: Statewide Stream Biostimulatory Project

Description: The State Water Board is developing a project to address biostimulatory substances in streams, including nutrients. The project is in the early draft stages of development. It is unknown if the project will include narrative or numeric objectives, guidelines, and/or state-wide standardization of methods.

Related Impacts: The Biostimulatory Project is early in the development phase and it is not reasonably foreseeable to determine if the project would result in cumulative impacts. The implementation required for Biological Objectives is expected to address biostimulatory issues in streams. Thus, while there is a potential nexus between the projects there should not be considerable cumulative impacts.

Project: Water Quality Control Policy for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems (OWTS Policy)

Description: The State Water Board adopted the OWTS Policy on June 19, 2012 (Resolution No. 2012-0032). The OWTS Policy establishes a Statewide, risk-based, tiered approach for the regulation and management of OWTS installations and replacements, and recognizes the effectiveness of local permitting agencies. The OWTS Policy requires various risk-level OWTS to implement site-specific design, treatment, and flow-based requirements to protect ground and surface waters.

Related Impacts: The OWTS Policy could demand a higher level of wastewater treatment from such facilities. Most OWTS facilities should have no impact on surface waters, but where there is the potential for surface water impacts the OWTS policy requires the implementation of additional compliance measures. The implementation of additional treatment or compliance measures for OWTS, particularly for replacement and Tier III and IV systems, should also result in further implementation of Biological Objectives through improved biostimulatory pollutant reduction and/or elimination. Thus, while there is a potential nexus between the projects there should not be considerable cumulative impacts.

Project: Statewide Reservoir Mercury Program and Mercury Provisions

Description: On May 2, 2017, the State Water Board adopted Resolution 2017-0027, which approved “Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California—Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions.” Resolution 2017-0027 provides a consistent regulatory approach throughout the state by setting mercury limits to protect the beneficial uses associated with the consumption of fish by both people and wildlife. Additionally, the State Water Board established three new beneficial use definitions for use the State and Regional Water Boards in designating Tribal Traditional Culture (CUL), Tribal Subsistence Fishing (T-SUB), and Subsistence Fishing (SUB) beneficial uses to inland surface waters, enclosed bays, or estuaries in the state.

State and Regional Water Board staff are developing a statewide water quality control program for mercury in reservoirs. The Statewide Mercury Control Program for Reservoirs will address 131 reservoirs identified as mercury-impaired as of June 2017. Implementation of the Statewide Mercury Control Program for Reservoirs would occur over two phases. Phase 1 is expected to last for 10 years and will include pilot tests in select reservoirs, after which the State Water Board will conduct a program review.

Related Impacts: Implementation of Biological Objectives should improve the condition of reservoirs by reducing and/or eliminating discharges of pollutants, including sediment, into surface waters, namely streams flowing into reservoirs. Thus, while there is a potential nexus between the projects there should not be considerable cumulative impacts.

1.7.2. Project-Specific Cumulative Impact Analysis

Implementation projects associated with the reasonably foreseeable methods of compliance with Biological Objectives may occur throughout the San Diego Region. It would be highly speculative to estimate the specific project-level actions that would or could occur in or around these projects that would result in a cumulative effect. Projects associated with reasonably foreseeable methods of compliance would typically occur in existing developed sites or locations or involve monitoring and assessment in surface waters. The other types of actions that may occur in and around existing sites and developed areas are infrastructure maintenance, infrastructure replacement and/or improvements, redevelopment projects, and/or other infill projects. The impacts of these types of actions typically involve air quality, noise, and traffic associated with construction. Depending on the timing of the implementation of the reasonably foreseeable methods of compliance, these impacts could combine with the potential impacts of Biological Objectives. It is unknown and speculative what other activities would occur around monitoring and assessment sites and activities. The cumulative impacts of specific projects designed to comply with the requirements of Biological Objectives should be considered by the implementing agency or local municipality. It is possible and probable that implementation of Biological Objectives be combined with implementation of on-site infrastructure maintenance, infrastructure replacement and/or improvements, redevelopment projects, and/or other infill projects. However, if this does not occur it is possible there may be cumulative effects of the following nature:

- 1) Noise and Vibration - Residents in the near vicinity of implementation of structural treatment technologies and BMPs related to compliance with Biological Objectives may be exposed to noise and possible vibration. The cumulative effects, both in terms of added noise and vibration at multiple implementation sites, and in the context of other unrelated projects, would most likely not be considered cumulatively significant due to the typically minor and temporary nature of the installation and maintenance activities that could cause the noise and possible vibration. However, if deemed a considerable contribution to a cumulative impact, possible mitigation methods include: (1) scheduling installation and maintenance activities during daytime hours; (2) noise and vibration monitoring; (3) noise testing and inspections of equipment; and (4) an active community liaison program.

- 2) Air Quality - Implementation of Biological Objectives, including the reasonably foreseeable methods of compliance, may cause additional emissions of criteria pollutants and slightly elevated levels of carbon monoxide in focused areas during structural methods of compliance and, to a lesser extent, non-structural activities. Implementation of Biological Objectives, in conjunction with all other activities within the area, may contribute to a region's nonattainment status during the installation period. Since installation and maintenance-related emissions are typically minor and temporary, compliance with Biological Objectives is not expected to result in long-term significant cumulative air quality impacts. In the short-term, cumulative impacts could be significant if the combined emissions from the individual projects exceed the threshold criteria for the individual pollutants. In this case, mitigation measures include: (1) use of construction, maintenance, inspection, and/or monitoring vehicles with lower-emission engines or electric engines; (2) use of soot reduction traps or diesel particulate filters; and (3) use of emulsified diesel fuel (4) timing activities to avoid periods of very poor air quality.
- 3) Transportation and Circulation - Compliance with Biological Objectives may involve contemporaneous activities at a number of sites. Further, installation of structural controls may occur in the same general time and space as other related or unrelated projects. In these instances, construction activities from projects could produce cumulative traffic effects which may be significant, depending upon a range of factors including the specific location involved and the precise nature of the conditions created by the dual construction activity. Mitigation to address this potentially significant cumulative impact would involve special coordination efforts by local, regional, and state entities regarding the timing of various construction and other activities adversely affecting traffic. Overall, with this mitigation, significant cumulative impacts are not anticipated since coordination can occur and, as appropriate, transportation mitigation methods are available as discussed previously. Furthermore, combined coordination of projects could potentially reduce cumulative or other impacts by reducing duplicative efforts.
- 4) Greenhouse Gas Emissions - Compliance with Biological Objectives may involve contemporaneous control installation activities at a number of sites. Further, implementation of non-structural measures, such as maintenance activities and inspections, may occur in the same general time and space as other related or unrelated projects. In these instances, activities from all projects could produce greenhouse gas emissions which may have a significant cumulative impact, depending upon a range of factors (e.g., location, vehicular activity, machinery usage, etc.). As stated previously, the compliance activities associated with implementation of Biological Objectives would be short term and are not expected to cause substantial greenhouse gas emissions. However, Biological Objectives are expected to result in improvements in greenhouse gas conditions though the implementation of low-impact development measures and habitat restoration.

1.8. Alternatives Analysis

Applicable regulations (23 CCR, § 3777, subd. (b)(3)) require the substitute environmental documentation to contain an analysis of range of reasonable alternatives to the project and reasonably foreseeable methods of compliance that could feasibly meet the project objectives and to avoid or substantially reduce any potentially significant adverse environmental impacts.

The San Diego Water Board identified five alternatives for analysis. These alternatives were analyzed for consistency and impacts related to the following goals and intentions of the project.

As specified in Section 1 of the Staff Report, the goal and intent of the Biological Objectives project is to use biological assessment (“bioassessment”) to better protect and restore waters using biological metrics to directly measure beneficial use attainment. The amendment of the San Diego Water Board Basin Plan will help achieve the goal of the CWA to protect and restore the biological integrity of waters (33 U.S. Code § 1251), and of Porter-Cologne which defines the *Quality of Water* to include chemical, physical, biological, bacteriological, and radiological properties (California Water Code (CWC) section 13050). Biological Objectives are needed to ensure the reasonable protection of aquatic life beneficial uses (see CWC section 13241).

Specifically,

- 1) Biological Objectives are needed to conduct a true assessment of high quality waters for antidegradation of biological beneficial uses. E.g., chemically clean water is not sufficient to identify high quality waters (consider “clean” water in a concrete-lined channel).
- 2) Biological Objectives are a more pertinent objective than chemistry when establishing restoration plans under CWA Section 303(d) and for determination of appropriate management measures for discharge permits.
- 3) Using Biological Objectives instead of individual chemicals on a pollutant-by-pollutant basis will allow TMDL assessments and implementation to be more effective and efficient.
- 4) Biological Objectives will allow for regulated parties to consider more focused BMPs for their planned discharges. This will ultimately lead to market efficiencies and lower social costs.

1.8.1.No Project Alternative

The purpose of assessing a No Project Alternative in an environmental document such as this SED is to allow decision makers and the public to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. The No Project Alternative would involve the San Diego Water Board deciding not to approve any proposed amendments to the San Diego Water Board Basin Plan.

Under the No Project Alternative, aquatic and aquatic-dependent wildlife beneficial uses would continue to be assessed by proxy in the bulk of the San Diego Region's receiving waters using measurements of water and sediment chemistry as well as toxicity. Consistent with baseline conditions, this would not result in protection or the complete assessment of beneficial uses. Existing regulatory programs would continue to operate as conducted historically, with beneficial use protection and required regulatory restoration of biologically-based beneficial uses lacking a biological framework for restoration. Continued implementation of regulatory compliance measures, such as BMPs, would occur on a pollutant by pollutant basis without requirements for consideration of aquatic-life beneficial uses. In order to improve the accuracy of only using chemistry and toxicity to evaluate beneficial use attainment, regulatory costs would increase over time with the addition of an expanded chemistry and matrix suite spatially and temporally for both storm and non-storm conditions, as well as increased toxicity test species, matrixes, and conditions (e.g. temperature). Additional impacts are likely to be incurred through implementation of unnecessary compliance measures to address pollutants, which may or may not result in the protection or restoration of biologically-based beneficial uses. In addition, Biological Objectives would not be used to guide habitat restoration, likely resulting in habitat restoration that is either unnecessary, or not appropriately scaled to pollutant reductions or hydrologic improvements, which would result in potentially unwarranted impacts. This alternative does not meet the goals or intent of the project, and potentially results in unwarranted impacts, and thus the San Diego Water determines that this is not the preferred alternative.

1.8.2.State Water Board Alternative

In the State Water Board Alternative, the State Water Board would adopt Statewide Biological Objectives to be incorporated into all Regional Board Basin Plans. The Onsite Wastewater Treatment System Policy took this approach for nitrate (State Water Board 2012). Since 2008 the State Water Board has worked on this approach for Biological Objectives and has published a draft *Workplan for Developing Biological Objectives for Perennial Wadeable Stream in the State of California* in 2010 (State Water Board 2010). While the San Diego Water Board had begun the initial stages of development for regional Biological Objectives prior to 2008, the San Diego Water Board halted the regional process due to State Water Board's efforts. The San Diego Water Board reinstituted its parallel efforts as a response to its 2014/2015 triennial review of the Basin Plan. Recently, in December of 2016 the State Water Board announced it was "*initiating the process to develop a biological integrity assessment implementation plan for freshwater streams and rivers in California*²." This approach no longer includes narrative or numeric Biological Objectives to protect and guide restoration of beneficial uses. The approach proposes to instead focus on ensuring the consistent use of biological assessment in regulatory programs, with a primary focus on using consistent State standardized monitoring methods and analysis. This alternative does not meet the goals or intent of the project. The San Diego Water Board is not opposed to ensuring the standardization of biological assessment methods across monitoring programs, and has included this approach within the proposed project. However, the State Water Board Alternative would still retain the impacts associated with the No Project Alternative while not meeting the goals and intent of the project, and thus the San Diego Water Board determines that this is not the preferred alternative.

1.8.3.Biological Targets Alternative

In the Biological Targets Alternative, the San Diego Water Board would not adopt Biological Objectives, but would adopt a Basin Plan amendment to include an Implementation Plan for using biological targets to assess condition and to require dischargers to use biological targets during regulatory program processes. Under the Biological Targets Alternative, aquatic and aquatic-dependent wildlife beneficial uses may no longer be assessed by proxy using measurements of chemistry and toxicity in receiving waters, but could be assessed using biological monitoring, including stream bioassessment. While this alternative could allow for better assessment of the condition of receiving waters, the Board would have limited enforcement provisions for protection of existing conditions, including for high quality waters and antidegradation provisions, with protection relying on chemistry and toxicity-based measurements. This alternative would also lack the requirement to conduct physical assessment of receiving water pollution. Thus, this alternative potentially has similar impacts to the proposed project, but would foreseeably include additional impacts from unnecessary implementation measures, though not at the level of the No Project or State Board alternatives. Thus, this alternative does not meet the goals or intent of the project, nor does it reduce project impacts. For these reasons, the San Diego Water Board determines that this is not the preferred alternative.

² Web link: http://www.waterboards.ca.gov/plans_policies/biological_objective.shtml

1.8.4. Antidegradation-Only Alternative

In the Antidegradation-Only Alternative, the San Diego Water Board would adopt a numeric objective(s) for perennial and seasonal streams only for antidegradation purposes. No thresholds for determining beneficial use impairment would be established using the California Stream Condition Index. Instead, permittees and permit applicants would be required to use the California Stream Condition Index to assess whether their discharges or proposed discharges would degrade existing stream biological condition regardless of whether that condition is categorically poor or excellent. The Antidegradation-Only Alternative does not provide a mechanism for using Biological Objectives for the restoration of currently impaired waters. Thus, the project goal and intent to protect and restore the biological integrity of waters would only be partially met. Some potential impacts associated with compliance measures would be reduced in some cases. While our evaluation indicates this alternative is improved relative to other reasonable alternatives to the proposed project, the Antidegradation-Only Alternative does not meet all components of the project's goal and intent, and thus is not the preferred alternative.

1.8.5. Tiered Aquatic Life Use (TALU) or Biological Condition Gradient (BCG) Alternative

In the TALU/BCG Alternative, the San Diego Water Board would adopt multiple numeric objectives for various classes of streams, with more stringent numeric objectives for higher quality streams and less stringent numeric objectives for currently impacted streams. The TALU/BCG approach uses a process to classify streams based upon current condition using existing bioassessment data, and potentially models similar stream systems to set objectives based on their level of anthropogenic stressors. The setting of numeric objectives for differing stream classes or portions of the condition gradient is done under the assumption that such streams have a “best attainable” condition given their existing local anthropogenic constraints (e.g. lined with concrete for flood control, severely eroded due to uncontrolled storm water discharges, etc.).

While this approach could potentially reduce impacts associated with some methods of compliance by setting lower standards for certain streams (therein not requiring compliance measures be implemented) the TALU/BCG Alternative is not the preferred alternative for the reasons set forth below.

First, the assumptions regarding a stream's “best attainable condition” are inconsistent with the mission and long-standing practice of the San Diego Water Board to protect, restore, and enhance conditions in waterbodies. The TALU/BCG Alternative assumes that stream systems can never improve over time, and disregards the adaptive MEP framework in existing municipal storm water permits and non-regulatory efforts from other entities to promote and allow for in-stream habitat restoration.

Second, TALU/BCG approach also discounts technological and practical advancement that may assist with discharge treatment and the restoration of degraded Beneficial Uses over time. For instance, redevelopment of urban and suburban areas using practices to capture and/or infiltrate storm water to boost water supplies is expected to reduce the hydromodification impacts to streams, and thus provide opportunities over time for stream rehabilitation.

Third, the determination of each stream's individual expectations across the San Diego Region would need to rely on modeling efforts or extensive monitoring for each stream, followed by a formal regulatory-process determination of the "best attainable" condition for each stream. While it is possible for models to be developed to predict the Biological Condition of a stream (e.g. Beck et al. *under review*), models are largely land-scape based, and thus are not suitable for determining actual water quality condition, as they may over or under-estimate beneficial use attainment. Models do not consider site-specific or drainage-area specific implementation efforts to address pollutants and/or restore habitat. The monitoring efforts would be time and resource intensive for both the San Diego Water Board, regulated entities, and the public, as all streams within the Region would likely require classification within the Basin Plan as Basin Plan amendments, and with improvement over time would require the San Diego Water Board to conduct further Basin Plan amendments to reclassify improved streams. This process, which would be subject to public and peer review, would require additional potential impacts due to enhanced monitoring requirements to make waterbody determinations for all stream segments in the region on a continuous basis.

For these reasons the TALU/BCG Alternative does not meet the project's goal and intent, and thus is not the preferred alternative.

1.8.6. Analysis of Project Alternatives

The San Diego Water Board has chosen as its preferred alternative the current proposed project to amend the San Diego Region Basin Plan to incorporate a numeric objective for perennial and seasonal streams and narrative guidance for the development of future biological objectives. No other alternative fully meets the goals and intent of the project. Of the considered alternatives, the most preferred alternative would be the Antidegradation Only Alternative, as it would ensure the protection of Beneficial Uses of streams using CSCI scores at least based on their current condition. However, this alternative would not result in meaningful guided restoration within the existing regulatory framework.

1.9. Water Code Sections 13241, 13242, and Antidegradation

1.9.1. California Water Code 13241

This section of the SED provides an evaluation of the factors specified under California Water Code Section 13241 associated with the proposed Basin Plan amendment.

The California Water Code Section 13241 specifies that:

Each regional board shall establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance; however, it is recognized that it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses. Factors to be considered by a regional board in establishing water quality objectives shall include, but not necessarily be limited to, all of the following:

- (a) Past, present, and probable future beneficial uses of water.*
- (b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.*
- (c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.*
- (d) Economic considerations.*
- (e) The need for developing housing within the region.*
- (f) The need to develop and use recycled water.*

Past, present, and probable future beneficial uses of water

In 1972, the State Water Board adopted a uniform list and description of beneficial uses to be applied throughout all basins of the State. During the 1994 Basin Plan update, beneficial use definitions were revised and some new beneficial uses were added. The following beneficial uses (Table 6) are identified in the Basin Plan for surface waters in the San Diego Region

Table 6. Beneficial Uses for Surface Waters in the San Diego Region

Beneficial Use	Abbreviation
Municipal and Domestic Supply	MUN
Agricultural Supply	AGR
Industrial Process Supply	PROC
Industrial Service Supply	IND
Ground Water Recharge	GWR
Freshwater Replenishment	FRSH
Navigation	NAV
Hydropower Generation	POW
Contact Water Recreation	REC-1
Non-contact Water Recreation	REC-2
Commercial and Sport Fishing	COMM
Aquaculture	AQUA
Warm Freshwater Habitat	WARM
Cold Freshwater Habitat	COLD
Inland Saline Water Habitat	SAL
Estuarine Habitat	EST
Marine Habitat	MAR
Wildlife Habitat	WILD
Preservation of Biological Habitats of Special Significance	BIOL
Rare, Threatened, or Endangered Species	RARE
Migration of Aquatic Organisms	MIGR
Spawning, Reproduction, and/or Early Development	SPWN
Shellfish Harvesting	SHELL

The section of the SED and Staff Report which discusses compliance with the Antidegradation Policy considers the effect of Biological Objectives on present and probable uses of water.

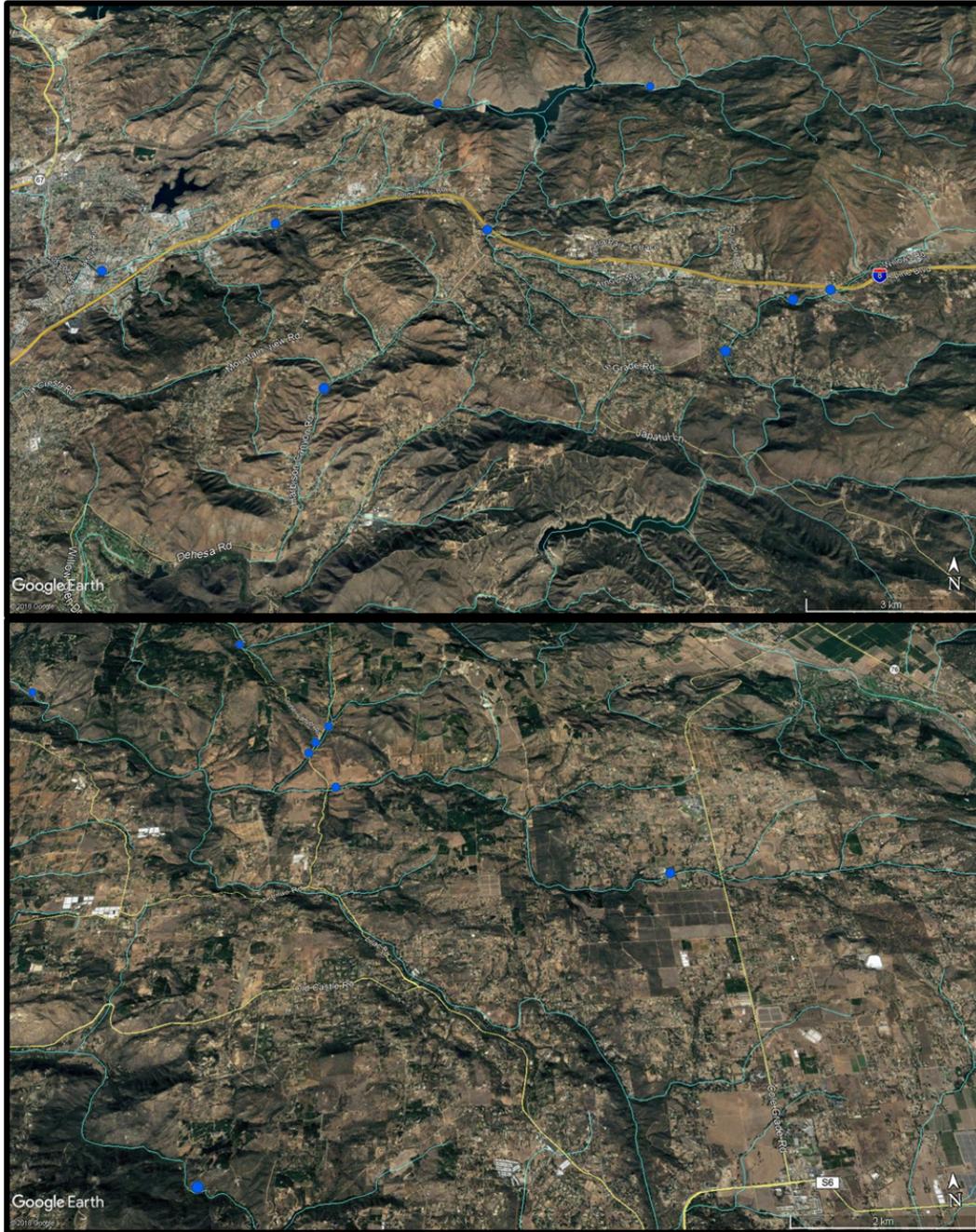
Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto

The amendment of the Basin Plan to incorporate Biological Objectives is a response to the documented need to properly evaluate environmental characteristics for waterbodies in the Region (San Diego Water Board 2012, San Diego Water Board 2013). The direct incorporation of numeric Biological Objectives will provide a framework for the San Diego Region to evaluate the environmental characteristics required under CWC 13241, and that framework is consistent with the San Diego Water Board's Practical Vision (San Diego Water Board 2013) and Resolution R9-2012-0069 (San Diego Water Board 2012). The amendment of the Basin Plan would apply to surface waters in the San Diego Region. The most recent water quality data assessment across the San Diego Region was conducted pursuant to CWA sections 305(b) and 303(d), and adopted by Resolution of the San Diego Water Board (R9-2016-0196) on October 12, 2016. This assessment determined that impairments were present in 166 waterbody segments, with 237 new pollutant listings associated with the impairments (San Diego Water Board 2016). Of those, 29 waterbody segments were identified as having impaired biological condition associated with a pollutant(s).

Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area

In the San Diego Region, almost 30 percent of stream-miles are estimated to be similar-to-reference and in good condition based upon probabilistic surveys (see section 1.3.1). While many of these sites occur within minimally disturbed areas, other sites are located in areas where discharges associated with municipal, construction, and industrial storm water, irrigated agriculture, and other anthropogenic activities occur (Figure 3).

Figure 3. Sample maps of benthic macroinvertebrate samples with CSCI scores greater than 0.79 (blue dots) in areas subject to discharges associated with municipal, industrial, and construction storm water, as well as irrigated agriculture and other anthropogenic activities. Top map shows portions of the San Diego and Sweetwater Hydrologic Unit while bottom map shows portions of the San Luis Rey Hydrologic Unit.



Economic Considerations

Background

California regulations under CWC section 13241(d) require the Water Boards to consider economics associated with the establishment of Basin Plan water quality objectives. In addition, as part of the SED's environmental analysis, the San Diego Water Board must consider a range of economic factors (PRC 21159(c)). These economic considerations are covered in this section of the SED.

This section includes the San Diego Water Board's economic analysis of the most reasonably foreseeable methods of compliance that a discharger may use to ensure compliance with the proposed Biological Objectives. Reasonably foreseeable methods to comply with regulations associated with the Basin Plan amendment include:

1. Monitoring and assessment of biological condition, including stream invertebrates, stream algae, riparian habitat, and water chemistry / toxicity.
2. Measures to reduce the adverse characteristics of waste discharges to streams with aquatic life beneficial uses, such as pollutant and flow control measures.
3. Measures to correct physical impairments of Biological Objectives in streams, including in-stream enforcement or restoration activities.

Economic considerations for amending the Basin Plan are not limited to considerations regarding compliance with the amendment. Economic considerations also include considerations of the value of aquatic and aquatic-dependent wildlife beneficial uses associated with the amendment.

The specific compliance measures to be implemented will occur through existing regulatory permitting or non-permitting (e.g. financial assistance or enforcement) procedures and depend on the magnitude, duration, location, number, and other factors related to the discharge(s). Identifying the specific costs for implementation of site-specific projects is speculative at this time and the economic considerations for compliance presented in this section serves only to demonstrate potential costs. Therefore, this section discloses typical costs of the reasonably foreseeable actions.

Economic Considerations of Beneficial Uses: Ecosystem Services

Ecosystem services are the benefits that people obtain from specific elements of the natural environment that are vital to human health and livelihood. Ecosystem services are typically divided into broad categories that include provisioning consumptive use services, such as seafood or raw materials, regulating non-consumptive services, such as water and air purification, and cultural services, such as recreational or spiritual activities (Balmford et al. 2002, NAS 2004, Figure 4).

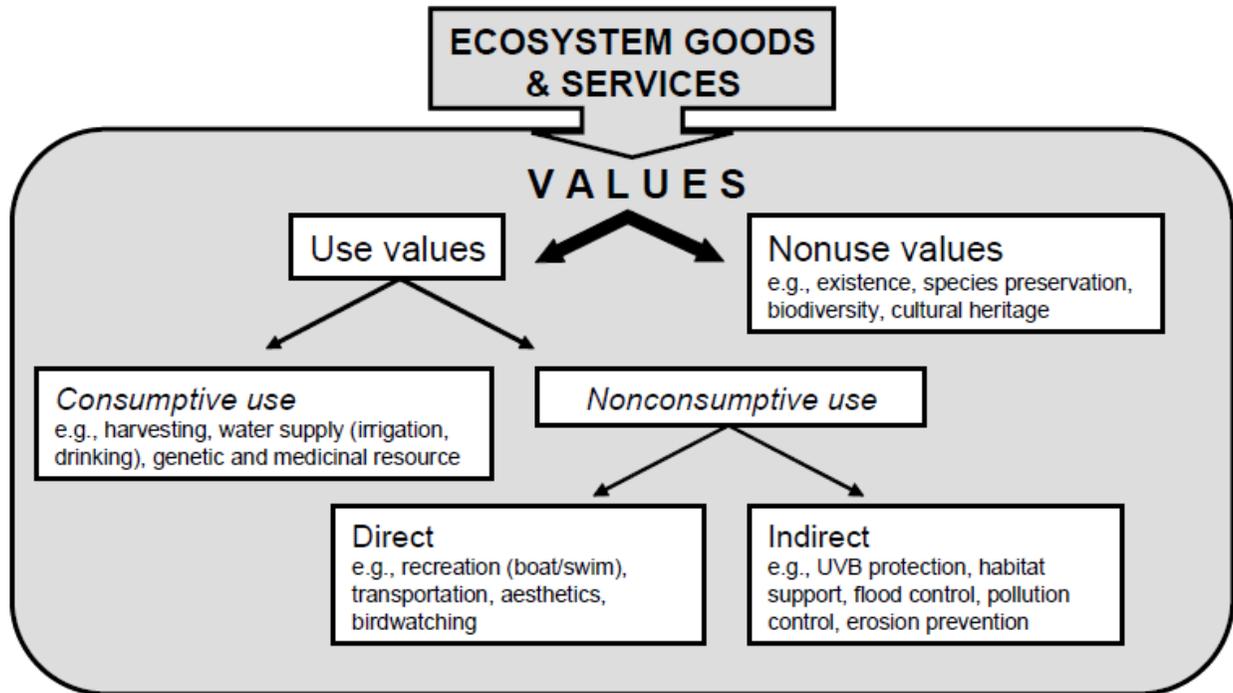
For the San Diego Water Board Basin Plan, many beneficial uses are themselves ecosystem services (e.g. municipal and domestic supply, aquaculture, recreation) that rely upon sufficient ecosystem integrity in order to provide that service(s). Degradation of aquatic and aquatic-dependent wildlife beneficial uses modifies habitat, can reduce flood capacity, nutrient uptake and cycling, pollutant buffering, and temperature regulation while increasing human health risk (e.g. Poff et al. 1997, Griffin and Kellogg 2004, Hester and Gooseff 2010, Arthington et al. 2010), thus degrading associated beneficial uses resulting in a loss of ecosystem services (Bloud and Hunhammar 1999, Sheaves et al. 2014). This loss of ecosystem services comes with an incorporated societal cost and is one driver behind regulatory law and waterbody restoration activities (e.g. CWA 404/401 program, USEPA 2016), with studies showing that restoration results in a positive return on expenses incurred (e.g. Elmqvist et al. 2015). For example, the presence of natural wetlands has been shown to attenuate and reduce bacterial contamination, which in turn protects human health Beneficial Uses associated with recreational activities (see Myers and Ambrose 2015).

The lack of biological criteria to assess, protect, and guide restoration of biological integrity has contributed to a net loss of ecosystem services with associated economic societal costs, often beyond the capabilities of typical economic analysis and assessment, such as for greenhouse gas sequestration (e.g. Lewis et al. 2015, CalEPA 2015). While limited information exists, the State of California has allocated over \$21 million dollars in funding to wetland restoration projects as part of the *Greenhouse Gas Reduction Program*. In addition, some ecosystem services related to consumptive and non-consumptive use have been valued on a statewide basis, including the value of fisheries and outdoor recreation. The National Ocean and Atmospheric Administration's 2011 publication on *Fisheries Economics of the United States* estimates the annual value of commercial and recreational fisheries in California (COMM beneficial use in San Diego Region) to be \$1.9 trillion dollars in total state-wide (NOAA 2011). Estimates of the value of outdoor recreation statewide is over \$119 billion dollars in total, with over 59 percent of California residents participating in outdoor recreational activities annually (OIA 2012).

Incorporation of Biological Objectives in the San Diego Water Board Basin Plan will assist in the protection and restoration of beneficial uses and their associated ecosystem services in the San Diego Region.

The amendment of the San Diego Water Board Basin Plan to incorporate numeric Biological Objectives will insure, at a minimum, antidegradation provisions are incorporated into regulatory actions to prevent the loss and associated cost of the loss of ecosystems services. Therefore, economic implementation costs related to discharger compliance may be outweighed by the potential societal cost of lost ecosystem services, especially as acknowledged in current state policies and orders (e.g. Executive Order W-59-93, State Senate Bill 535, State Assembly Bill 1504).

Figure 4. From NAS 2004. Ecosystem Goods and Services Framework



Economic Considerations Related to Compliance: Background

The incorporation of Biological Objectives will result in costs associated with compliance under existing regulatory programs. Costs associated with compliance include the cost of conducting biological assessment monitoring and assessment, costs associated with permit/discharge modification(s), and costs of restoration activities associated with restoring degraded biological conditions. These are discussed below.

Economic Considerations Related to Compliance Monitoring

The incorporation of Biological Objectives will result in costs associated with compliance under existing regulatory programs to assess whether Biological Objectives are affected by or potentially affected by a discharge or proposed discharge of waste. Monitoring and assessment are a critical component of compliance with Biological Objectives.

Compliance monitoring for regulatory purposes is described in detail in Section 5 of the Staff Report. In the San Diego Region, most individual permits (e.g., Waste Discharge Requirements for surface waters, Clean Water Act Section 401 Certifications) currently require receiving water monitoring that includes some form of biological assessment. This includes conducting bioassessment for discharges to perennial and seasonal streams. For existing permits with bioassessment monitoring, there may be minimal costs associated with updating methods to insure consistency with most recently approved State of California Standard Operating Procedures (SOPs) and reporting requirements where needed. Updating to the most recent state and federal methods standards is not atypical and most often occurs during permit renewal.

For permits that currently do not require bioassessment the cost of compliance monitoring will be increased. As an example, for fiscal year 2016-2017 the State of California SWAMP pays \$4,305/site for sampling and taxonomic analysis at targeted sites according to the most recent State of California bioassessment SOP for collecting benthic macroinvertebrates and algae. Conducting CRAM adds \$1,702 per site, bringing the cost to \$6,007. The number and frequency of samples required is dependent on the scope and magnitude of the discharge, which can also vary spatially and temporally as described in Section 5 of the Staff Report. Compliance monitoring costs for some discharges may be economized by participation in regional monitoring efforts where applicable and authorized by the San Diego Water Board. However, depending on the discharger, in some cases conducting bioassessment monitoring may reduce the need for chemistry monitoring, thus potentially offsetting increased the cost.

For individual NPDES permits for non-storm water discharges (Staff Report, Section 5) where biological degradation may be attributed to the discharge through the bioassessment monitoring conducted upstream and downstream of the discharge(s), investigations will be required to determine the cause of the degradation associated with the discharge. This does not entail a traditional causal assessment, such as USEPA's CADDIS, but will require conducting a discharge specific evaluation. This may include a toxicity identification evaluation or similar rapid causal-type assessment to determine what specifically in the discharge is causing or contributing to the degradation. For fiscal year 2016-2017 the State of California SWAMP pays \$5745 to conduct toxicity identification evaluations, and several agencies have developed rapid causal assessment tools, including in conjunction with USEPA, that work on a site-specific basis at much lower costs than the traditional USEPA CADDIS approach (City of San Diego 2015b, SCCWRP 2016, Gillett et al. *under review*). Supplemental receiving water monitoring using additional parameters (e.g. toxicity, sediment pesticides) may be required to document sources of degradation.

Economic Considerations Related to Restoration Activities

Economic considerations also occur related to restoration activities needed to restore WARM, COLD, and WILD beneficial uses. Waterbodies where water quality standards are not attained are listed by the San Diego Water Board as impaired pursuant to CWA section 303(d). Restoration of beneficial uses must occur for these waterbodies. Restoration of beneficial uses for impairments can be achieved using regulatory or non-regulatory means, including but not limited to enforcement, existing permit implementation, non-TMDL agreements, traditional TMDLs, and/or grant funding mechanisms.

It is important to note that a Basin Plan amendment to create Biological Objectives does not itself require restoration, but would be used to guide the most efficient restoration of the WARM, COLD, and WILD beneficial uses. As discussed in Section 5 of the Staff Report, discharger and San Diego Water Board evaluation of if a current or proposed discharge causes or contributes to an exceedance of Biological Objectives includes an assessment of the chemical, physical, and biological condition of receiving waters subject to the discharge. This is a critical component of economic considerations related to restoration activities, as addressing biological impairment may include 1) the regulation of the discharge(s) under current regulatory permitting programs and TMDLs, and 2) the restoration of hydrologic and in-stream habitat condition and processes.

Economic Considerations Related to Restoration Activities: Existing Regulatory Permitting Programs

The incorporation of Biological Objectives into the Basin Plan, as discussed in Section 5 of the Staff Report, will result in the integration of Biological Objectives into existing regulatory programs. If degradation is observed and the discharge is determined to be source that causes or contributes to that condition, additional permit modifications will be required. The requirement to modify Water Board permits in response to observed degradation is not a new regulatory requirement, as BMPs and/or effluent limitations are already required to be focused or modified to protect water quality when water quality objectives are not met in receiving waters.

The incorporation of Biological Objectives will guide BMP and/or effluent limitation modifications for chemistry-based water quality objectives by focusing on those pollutants in the discharge that are most important, rather than on additional BMPs and/or effluent limitations to address pollutants that are not causing or contributing to biological degradation. The cost of implementation under existing permit requirements is not additional and will range widely, depending on the project-specific BMPs or methods that responsible parties select. The use of Biological Objectives to focus implementation actions on specific pollutants may also result in less expenditures than under current permitting and planning requirements. The identification of specific pollutants and subsequent focus on those pollutants and needed actions has been shown to reduce costs associated with implementation in other states (Karr and Chu 1999). All Economic Consideration costs included are preliminary estimates as identifying the specific controls or methods that dischargers use is speculative at this time.

A wide range of structural and non-structural methods and technologies are available associated within reasonably foreseeable methods of compliance within existing regulatory permitting programs. These are also available for many permitted agencies to address water quality, including for Biological Objectives, through grant programs. For example, the Orange County Transportation Authority Measure M2 Environmental Cleanup Program made available approximately \$57.5 million in funding for water quality improvements to **supplement** existing programs:

The Measure M2 Environmental Cleanup Program (Program) helps improve overall water quality in Orange County from transportation-generated pollution. Program funds will be allocated on a countywide competitive basis to assist jurisdictions in meeting the Clean Water Act for controlling transportation-generated pollution. The funds are designed to supplement, not supplant, existing transportation-related water quality programs.

Eligible applicants include Orange County city and county agencies such as planning departments, public works agencies, recreational departments, etc. Third parties, such as water and wastewater public entities, environmental resource organizations, nonprofit 501(c) environmental institutions, and homeowners associations cannot act as the lead agency for a proposed project; however, these agencies can jointly apply with a city and/or the County of Orange. Approximately \$57.5 million was made available through the Early Action Plan (EAP) expenditures.

Approximate costs associated with typical structural storm water BMPs that might be implemented as reasonably foreseeable methods of compliance are provided below. Cost estimates may vary widely, with retrofitting structural BMPs typically requiring more costs. Cost estimates provided by Caltrans' *BMP Pilot Retrofit Pilot Program* were from BMPs retrofitted on existing state-owned land (Table 7, below).

Table 7. From Caltrans 2004. Cost of BMP Technologies (Retrofit)

BMP Type	Avg. Adjusted Construction Cost	Annual Adjusted O & M Cost	Present Value O & M Cost	Life-Cycle ^a Cost/m ³
Wet Basin	\$448,412	\$16,980	\$452	\$2,183
Multi-Chambered Treatment Train	\$275,616	\$6,410	\$171	\$2,046
Oil-Water Separator	\$128,305	\$790	\$21	\$1,991
Delaware Sand Filter	\$230,145	\$2,910	\$78	\$1,990
Storm-Filter™	\$305,355	\$7,620	\$204	\$1,776
Austin Sand Filter	\$242,799	\$2,910	\$78	\$1,525
Biofiltration Swale	\$57,818	\$2,750	\$74	\$826
Biofiltration Strip	\$63,037	\$2,750	\$74	\$822
Infiltration Trench	\$146,154	\$2,660	\$71	\$804
Extended Detention Basin	\$172,737	\$3,120	\$83	\$673
Infiltration Basin	\$155,110	\$3,120	\$81	\$450
Drain Inlet Insert	\$370	\$1,100	\$29	\$39

^aPresent value of operation and maintenance unit cost (20 yr @ 4%) plus construction unit cost.

Of those identified from Caltrans 2004, low impact development (LID) BMPs had the lower costs, are required in existing storm water permit requirements, and have additional ancillary economic benefits over mechanical treatment systems. USEPA has also found, in a nationwide study, that LID BMPs result in cost-savings over conventional (and already required) stormwater controls (USEPA 2012c). For example, vegetated roofs are an effective LID technique that provides storm water runoff control, air quality improvement, increased energy efficiency, urban heat island reduction, and improved aesthetics. Costs of installation are typically offset by energy savings associated with reduced building cooling requirements (USEPA 2008a). Cisterns and rain barrels are LID techniques used to harvest, store, and release rain water from a roof downspout into the soil. The cost of a rain barrel is approximately \$216 for a single residential lot. The cost of a cistern can range from \$160 for a 165-gallon polyethylene tank to \$10,000 for a 5,000-gallon fiberglass/steel composite tank (LIDC 2007, http://www.lid-stormwater.net/raincist_cost.htm). Cisterns and rain barrels provide ancillary economic benefits through water re-use for vegetation or industrial re-use, reducing the use of potable water on such activities while further reducing the reliance on imported water, with savings from some projects of \$1000 per year (USEPA 2008b). Other LID structural treatment methods, such as biofiltration swales and strips, can be incorporated into/substituted into existing or planned development and redevelopment activities (including capital improvement projects), in areas where traditional landscaping would be installed.

For construction sites, it is reasonably foreseeable that compliance at sites will include slope stabilization and erosion control methods, such as fiber rolls, silt fencing, silt curtains, as well as sedimentation ponds to retain runoff and pollutants. Material costs vary, with fiber rolls ranging from \$20 to \$30 per 25-foot roll, silt fencing around \$1 per linear foot, and curtains \$20 per linear foot. Labor costs vary; however, they should be factored in for the installation, maintenance, and short-term maintenance. The maintenance requirements of rolls, fencing, and curtains are minimal, but short-term inspection is recommended to ensure that they remain firmly anchored in place and are not crushed or damaged by equipment traffic. Retention basins/pond costs vary, with some studies showing \$6.50 to 7.50/ft² (Horner et al. 1990). Operations and maintenance cost derive from labor associated with regular inspection and repairs from erosion, cracks, and breaches.

Non-structural BMP costs vary widely depending on type, scale, and duration (permanent, intermittent). Site cleaning and housekeeping nonstructural BMPs are operational and maintenance related, and derive from labor costs associated with the activity.

Additional examples of costs associated with project-specific structural BMPs can be found in the Orange County Transportation Authority's Measure M2 awards. As described above, these projects **supplement existing programs**, though they may be used for compliance purposes. The projects may also contain non-water quality related features in costs that are not funded (Figure 5).

Figure 5. Table of OCTA Measure M2 Tier 2 Funding Recommendations.

2012-13 OCTA Environmental Cleanup Program Tier 2 Call for Projects Funding Recommendations Funded Projects List										
Rank	Agency	Project Title	Description ¹	Project Category	Programmed Year ²	Cumulative Funding	Tier 2 Funding	Local Match	Total Project Cost	Score
1	Tustin	Tustin Legacy Detention Basin and Wetlands	~Proposed project will treat stormwater that flows into three water bodies, Peters Canyon Channel, Upper Newport Bay, and Lower Newport Bay. ~Proposed detention basin will use landscaping and its capacity to aid treatment of runoff from nuisance flows and small storms and provide flood flow attenuation.	Detention/infiltration basins	FY 2013-14	\$824,688	\$824,688	\$444,063	\$1,268,750	84.5
2	Laguna Niguel	Oso Creek Multi-Use Trails	Design and construct permeable pavements, landscaped infiltration strips, and bioretention BMPs that will replace 2.8 acres of existing impervious roadway pavements within public right-of-way along Forbes Road.	Bioswales	FY 2013-14	\$1,707,988	\$883,300	\$1,409,689	\$2,292,989	72.5
3	Newport Beach Carnation	Carnation Ave Litter Removal Project	~Install three continuous deflection separation units within this watershed to remove oil, grease, sediment and trash generated in and around Pacific Coast Highway. ~Continuous deflection separator system screens, separates and traps pollutants including the removal of 100 percent of floating pollutants.	Regional trash/litter debris removal systems	FY 2013-14	\$2,434,798	\$726,810	\$311,490	\$1,038,300	67.5
4	Irvine	Peters Canyon Wash Water Capture and Reuse Pipeline	~Peters Canyon Wash water capture and reuse pipeline designed to capture and permanently divert discharges of selenium-laden groundwater caused by regional transportation system subsurface infrastructure at four locations. ~Sewer diversion and infiltration/injection.	Runoff diversion	FY 2013-14	\$5,707,903	\$3,273,105	\$2,182,070	\$5,455,175 ³	67
5	Anaheim South	Brookhurst Street "South" Widening and Storm Swale	Construct 3.4 acres of vegetated swales and permeable pathways.	Bioswales	FY 2012-13	\$6,793,603	\$1,085,700	\$465,300	\$1,551,000	63
6	Dana Point	San Juan Creek LOISO2 Trash Removal & Dry Weather Diversion	~Diversion project to provide for 100 percent elimination of dry weather pollutant loads. ~Remove litter and other debris from diverted flows and enhance habitat in the watershed area upstream of project using arundo removal component. ~Includes arundo removal component to enhance the habitat in the watershed area upstream of the project. ~Trash separation/filter, nuisance water diversion to sanitary sewer.	Regional trash/litter debris removal systems	FY 2013-14	\$7,263,839	\$470,236	\$253,204	\$723,440	63
7	Santa Ana	Santa Ana Delhi Channel Diversion Project	Urban discharge diversion facility to capture and divert urban discharge low-flow into the sanitary sewer system to address urban surface water quality.	Runoff diversion	FY 2013-14	\$9,836,714	\$2,572,875	\$1,715,250	\$4,288,125	60.5
8	Costa Mesa	Industrial Way Water Quality and Storm Drain Improvement Project	~Install underground detention/infiltration facility within open grass field. ~Construct a parallel storm drain facility within Anaheim Avenue next to existing 30-inch pipeline.	Detention/infiltration basins	FY 2013-14	\$12,708,314	\$2,871,600	\$1,914,400	\$4,786,000	57.5

Economic Considerations Related to Restoration Activities: TMDLs and TMDL Alternatives

Where existing permitting efforts are insufficient to meet address CWA Section 303(d) listed waterbodies, TMDLs or TMDL alternatives are required in order to restore Beneficial Uses by allocating maximum pollutant loads capable of supporting Beneficial Uses. TMDLs may be needed for those waterbodies which do not meet Biological Objectives. For recent waterbody-specific TMDLs and alternatives in the San Diego Region, USEPA and the San Diego Water Board have required the inclusion of biological targets to assess if beneficial uses (e.g. WARM, WILD, EST) are met. Examples include the Los Penasquitos Sediment TMDL (Resolution No. R9-2012-0033), the Loma Alta TMDL Alternative (Resolution No. R9-2014-0020), a Famosa Slough TMDL Alternative, and a pending alternative Santa Margarita River Estuary TMDL. For these TMDLs, determining the biological target condition for beneficial uses (e.g. percent algal cover and biomass, wetland acres restored) guided the pollutant(s) of concern and reductions in pollutant(s). In addition, the Water Board's regulatory actions retained the biological targets as "goals" or "targets" for compliance. Under Biological Objectives, this approach would be maintained, though the biological "targets" would instead be formal minimum standard(s) for determination of TMDL success, with TMDL success being tied directly to receiving water restoration. While wasteload allocations would still be important, achieving Biological Objective restoration would take precedence over achievement of wasteload allocations.

Current TMDL practice is based upon modeling individual pollutants, which includes inherent uncertainty and built-in conservative margins of error. While modeling for the identification of pollutant wasteloads would remain largely the same, costs may be reduced or increased as TMDL implementation and beneficial use restoration success would be tied to attainment of the Biological Objectives and not a specific wasteload number. For example, specific wasteloads may not even be assigned or if assigned, once Biological Objectives are met, further reduction to meet the original wasteload may not be necessary (e.g. see SWRCB Resolution No. 2007-0008, Herbst 2002).

There could be increased costs for TMDL development associated with conducting causal assessment to determine what physical and chemical parameters are responsible for the impairment associated with degraded biological condition. Work in the San Diego Region found the USEPA CADDIS tool to show promise but be overly cumbersome and not cost effective (Schiff et al. 2015). More recent rapid causal assessment methods have been developed by the City of San Diego with Tetra Tech, and by SCCWRP, which automates the process and uses existing predictive modeling and extensive bioassessment datasets (City of San Diego 2015b, Gillett et al. *under review*). These efforts are presently funded by the San Diego Water Board and City of San Diego via a supplemental environmental project (SED).

While causal assessment is expected to incur an added cost in the TMDL development process, this cost will be minimized or offset by inefficiencies present in the current TMDL process, which has handled waterbodies on a pollutant-by-pollutant basis under the assumption that beneficial uses will be restored. This has been found to be a false assumption and costly oversimplification of ecological processes. For Beneficial Use restoration to take place, addressing the pollutants causing or contributing to the impairment, in addition to sources of pollution that are not pollutants, such as in-stream habitat and hydrologic restoration, must occur. Being able to specifically identify those pollutants that are a source of the beneficial use will prevent the use of TMDLs to “chase down” every pollutant that may be in exceedance of a water quality objective but that is not necessarily impacting a beneficial use.

As one of many examples, the Los Angeles Regional Water Quality Control Board adopted a TMDL in 2006 to address metals in Calleguas Creek and its tributaries. With TMDL adoption significant funds were spent to conduct a water effects ratio study on metals in Calleguas Creek, which determined assumptions regarding the creek’s ability to assimilate metals related to toxicity were overly conservative. This resulted in the development of a new staff report and re-opening of the TMDL, with subsequent re-adoption in 2016. Despite these extensive efforts by Los Angeles Water Board staff and dischargers, no findings or investigation of the actual biological condition of the receiving water was included in the regulatory staff reports, such as including bioassessment or CRAM data from Calleguas Creek or its tributaries, to determine actual biological condition and if other metals, other pollutants, or physical habitat modification and/or habitat loss might be impairing beneficial uses (e.g. see section III.A *Current Condition* in Los Angeles Water Board 2016). SWAMP bioassessment data results show very poor conditions, with a CSCI scores as low as 0.29 in Calleguas Creek. CRAM scores are below the 10th percentile of reference, with scores for physical structure, as well as buffer and landscape, scoring below the 1st percentile of reference (Table 1-1, SMC 2015). Other pollutants and pollution are likely causing or contributing to degraded Beneficial Uses. Therefore, it is unclear if the existing TMDL that is focused on concentrations of specific metals will actually restore any beneficial uses, or if it will simply remove some pollutants from the Clean Water Act 303(d) list. Adopting and implementing TMDLs on a pollutant-by-pollutant basis to restore aquatic and aquatic-dependent wildlife beneficial uses is not cost effective or time efficient.

Instead, the San Diego Water Board will consider both physical (see below) and chemical condition of receiving waters when considering TMDL or TMDL alternative development for waters with impaired aquatic life Beneficial Uses.

Economic Considerations Related to Restoration Activities: Restoration of Hydrologic and In-stream Habitat Condition and Processes

As discussed above and in Section 5.4 and 5.5 of the Staff Report, identifying the physical and chemical cause of biological impairment is needed for the restoration of Beneficial Use and biological condition. While not required under the scope of the Basin Plan amendment, a discussion of Economic Considerations related to the restoration of in-stream habitat and hydrology has been included as investment will be required to address streams where physical habitat modification is a source of the impairment to Beneficial Uses.

Historic modification of stream hydrology and habitat has caused or contributed to degraded stream biological condition in many San Diego Region streams (PSA 2016). Pursuant to USEPA Guidance for Integrated Reporting (USEPA 2015), streams where impairments occur due, wholly or in part, due to pollution such as hydromodification or habitat modification, are classified as Category 4c on the impaired waters (303d) list. This “pollution” is not subject to restoration under the traditional TMDL process, but through other regulatory mechanisms and activities, and via non-regulatory measures (e.g. grants, USEPA 2015). While not required under this Basin Plan Amendment, in-stream habitat restoration to restore degraded biological condition has been conducted within the San Diego Region, often resulting in increased biological integrity scores and improved Beneficial Uses. This restoration activity also can restore the natural assimilative capacity of a stream, thereby reducing the costs for pollutant controls on discharges. Finally, tools have been developed to identify habitat and hydrologic metrics to protect and restore biologic integrity (Stein et al. 2017a and 2017b, Rehn et al. 2018).

An extreme example of stream restoration is the Forester Creek Improvement Project in Santee, CA (Loflen et al. 2016). The project, completed in 2008 at a cost of \$36 million, most of which was for property procurement, restored a 2-kilometer section of Forester Creek. Due to upstream development and channel hardening within the City of El Cajon, the section of Forester Creek in the downstream City of Santee was subject to continued flooding and property damage, with street closures for every storm event of a 10-year magnitude or greater. The restoration project, funded largely by a SWRCB grant, included re-contouring of the creek, floodplain creation, invasive species removal, and vegetative planting. The project resulted in an increase in some water quality parameters and one downstream bioassessment score, though monitoring was inadequate to document long-term improvements.

In southern Orange County, Trabuco Creek has undergone multiple habitat restoration efforts from south of Crown Valley Parkway upstream to Santa Margarita Parkway. Prior restoration efforts on Trabuco Creek have been associated with CWA Section 401 permitting (e.g. CWA 401 Certification No. 03C-023, 12C-056), and have included stream restoration and enhancement, such as removal of *Arundo donax* from over 8,000 linear feet of streambed. CSCI scores following restoration meet the Biological Objectives, with scores of 0.96, 0.88, and 0.81 along the restored section (Figure 6)

Figure 6. Trabuco Creek in 2014 following restoration activities. This site had a CSCI score of 0.96.



In southern Orange County, Sulphur Creek was identified as a high-priority restoration site within the Aliso Creek Watershed Management Plan. The City of Laguna Niguel received State of California funding under Proposition 13 (\$928,723), California Coastal Conservancy (\$287,000), and Department of Water Resources to restore approximately 7,900 linear feet of stream, including 3,600 linear feet of concrete removal. The project also included stream re-contouring and reconnection to a floodplain, as well as invasive species removal and native species plantings.

Economic Considerations Related to Restoration Activities: Summary

In summary, economic costs related to implementation of Biological Objectives are primarily expected through increased permit monitoring costs and via conducting rapid and/or traditional causal assessments. These efforts are needed to determine the specific physical and chemical source contributions for impaired biological conditions, both for case-by-case specific discharges or as part of TMDL and TMDL alternative development. While these are added costs, it is important to note that, for economic consideration, section 303d of the CWA requires restoration of aquatic life beneficial uses based on chemistry or toxicity measurements. As a result, the San Diego Water Board expects these costs related to implementation to be off-set by:

- 1) Guiding implementation of BMPs and/or effluent limitations to those activities/discharges that are most important for protecting and restoring ecosystem integrity rather than all pollutants in all discharges, and
- 2) Guiding the development of TMDLs and TMDL alternatives for restoration of stream impairments using information on physical pollution and specific chemical pollutants causing or contributing to impairment, thus providing actual ecosystem services benefits from prioritizing meaningful restoration at meaningful time scales.

Economic Considerations for future Basin Planning Water Quality Objective Actions

The use of Biological Objectives is expected to result in economic impacts over the long-term associated with the updating of chemistry-based water quality objectives. Similar to the development of Waste Load Allocations for TMDLs discussed above, the establishment of chemistry-based water quality objectives in the San Diego Water Board Basin Plan was conducted using the best-available science on the levels of pollutants that would or would not be protective of human health and aquatic life beneficial uses. The establishment of those objectives to protect aquatic life comes with assumptions, margins of safety, and site-specific correctional factors (e.g. California Toxics Rule, “CTR”). It is expected that Biological Objectives can, over time, provide evidence for and be used to modify existing chemistry water quality objectives that are over or under-protective of beneficial uses. Both situations are expected to result in overall cost savings. Chemistry-based water quality objectives that are over-protective result in excess cost expenditures for the treatment of pollutants to levels beyond those necessary for beneficial use protection. In contrast, water quality objectives that are under-protective can require additional expenditures for dischargers. This can occur from the development of TMDLs to determine appropriate levels of pollutants in receiving waters and discharges (see above discussion), rather than simply incorporating a more accurate water quality objective up front.

The need for developing housing within the region

The amendment of the Basin Plan to include Biological Objectives will not prevent development or limit the addition of housing within the San Diego Region. Housing inventory in the San Diego Region is currently low with a particular shortage in affordable housing relative to the need. The effect of market forces greatly outweighs any likely effect of a Basin Plan amendment for Biological Objectives. The inclusion of Biological Objectives will not restrict the use of property that incorporates water quality measures to protect and restore aquatic and aquatic-dependent wildlife-related beneficial uses. The inclusion of Biological Objectives will provide for more accurate determinations of assessment related to avoidance, protection, and restoration associated with regulatory permitting activities for impacts to waters of the State. This process may occur on a site-by-site basis or as part of larger regional planning efforts (e.g. water quality improvement planning, general plan updates). Scientific studies on the success of mitigation associated with development, including housing, found the lack of Biological Objectives for aquatic and aquatic-dependent wildlife beneficial uses allowed for unmitigated degradation to occur associated with projects, resulting in the loss of beneficial uses (Sudol and Ambrose 2002, Ambrose et al. 2007).

The need to develop and use recycled water

“Recycled water” means water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource (CWC, § 13050(n)). The amendment of the Basin Plan to include Biological Objectives will not prevent the development and use of recycled water. On January 17, 2014, Governor Brown signed a proclamation declaring a drought State of Emergency in California. The Governor ordered the State Water Board to take a number of actions to address the drought, including: 1) execute a statewide water conservation campaign; 2) expedite processing of water transfers, as called for in Executive Order B-21-13; 3) immediately consider petitions requesting consolidation of the places of use of the State Water Project and federal Central Valley Project, which would streamline water transfers and exchanges between water users within the areas of these two major water projects; 4) accelerate funding for water supply enhancement projects; 5) put water right holders throughout the State on notice that they may be directed to cease or reduce water diversions based on water shortages; 6) consider modifying requirements for reservoir releases or diversion limitations, where existing requirements were established to implement a water quality control plan; and 7) take actions necessary to make water immediately available.

The San Diego Water Board has made it a priority to facilitate the use of recycled water in a manner that protects beneficial uses (San Diego Water Board 2013), and regional water purveyors are continually evaluating ways to increase the use of recycled water in response to drought conditions and as a way to reduce the region's dependence on imported water sources. The San Diego Water Board currently regulates the discharge of recycled water for storage as part of the drinking water purification process ("indirect potable reuse") as well as for discharges to land for irrigation purposes and for groundwater augmentation. The State Board has a Policy for Water Quality Control for Recycled Water (Recycled Water Policy, State Water Board 2013), whose purpose is to "provide direction to the Regional Water Quality Control Boards (Regional Water Boards), proponents of recycled water projects, and the public regarding the appropriate criteria to be used by the State Water Board and the Regional Water Boards in issuing permits for recycled water projects."

The San Diego Water Board is currently working with dischargers on proposed projects to discharge recycled water to reservoirs for indirect potable reuse (San Diego Water Board 2013b). Reservoirs are not included in the proposed Biological Objectives and, unlike streams, are artificial waterbodies managed specifically for drinking water and recreation. The system for the indirect potable reuse program may require permits to discharge to non-reservoir receiving waters associated with emergency overflow events or operational diversions for public health due to system failures or other emergencies. It is possible such events could result in a discharge into waters covered by Biological Objectives. However, it is speculative to determine if such a discharge may or may not occur. Regardless, Biological Objectives would not prevent the discharge, but would be used, in conjunction with existing chemistry-based water quality objectives, to evaluate if the discharge impacts beneficial uses, consistent with the Recycled Water Policy.

The use and development of recycled water for irrigation purposes is not expected to be impacted by Biological Objectives as public health (CCR Title 22) and water quality standards do not permit the application of recycled water for irrigation purposes to waters of the state (State Water Board 2009, State Water Board 2013).

Recycled water in the San Diego Region may be utilized to recharge and/or improve the water quality of groundwater basins in the San Diego Region. Discharges of recycled water for recycled water, similar to the use of recycled water for irrigation, must implement the requirement under title 22 (CCR Title 22), and authorizes the discharge of groundwater to land, not surface waters (State Water Board 2014).

In general, the amendment of the Basin Plan to include Biological Objectives will allow for more accurate determinations of whether discharges of recycled water do or do not adversely impact beneficial uses. Biological objectives will insure that more accurate determinations of protection and restoration associated with regulatory permitting activities will be possible.

In addition, it is expected that the implementation of Biological Objectives may result in an increase in the development and use of recycled water. Biological objectives may be used to identify where excess flows to streams associated with existing permitted activities (e.g. groundwater dewatering) are impacting beneficial uses. For such situations dischargers may choose to implement additional or alternative BMPs that could include treatment controls and discharge modifications to meet Biological Objectives, or alternatively beneficially re-use (recycle) the discharge. For such cases the beneficial re-use of waters that would otherwise be discharged would assist in meeting the goals of the State of California while preventing impacts to beneficial uses and potentially reduce costs associated with permitting, treatment, and, if the project has on-site water needs, the procurement of potable water for non-potable purposes.

1.9.2. Water Code 13242

Chapter 4 of the Basin Plan contains a program of implementation for the water quality objectives in Chapter 3. Pursuant to CWC section 13242, the program of implementation must include but not be limited to the following:

- A description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private.
- A time schedule for actions to be taken.
- A description of surveillance to be undertaken to determine compliance with objectives.

Pursuant to CWC section 13242, the San Diego Water Board's program of implementing the proposed water quality objective is through assessment in integrated reporting, monitoring to prevent antidegradation, establishment or modification of monitoring and assessment in NPDES permits and WDRs, CWA section 401 Certification, and TMDLs. A discussion of these actions, their time schedules, and surveillance (monitoring) is included in Section 5 of the Staff Report.

1.9.3. Antidegradation Analysis

Water quality objectives must conform to USEPA regulations covering antidegradation and conform to State Water Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California (Antidegradation Policy). Application of the antidegradation provisions to the water quality objective-setting process requires supporting documentation and appropriate findings whenever a water quality objective is made less restrictive to accommodate the discharge of pollutants or other activities of people. Section 5 of the Staff Report discusses Biological Objectives with respect to antidegradation. This amendment will not change or remove any existing water quality objectives or beneficial uses.

The amendment of the San Diego Water Board Basin Plan to include Biological Objectives will protect beneficial uses associated with aquatic and aquatic dependent wildlife and will not result in a lowering of water quality. Instead, the amendment to incorporate Biological Objectives will help protect existing water quality and facilitate long-term improvement by setting numeric standards for the protection of high-quality waters and guide meaningful restoration activities at appropriate time scales using expected conditions at reference locations. Research to date in the San Diego Region has demonstrated the loss of aquatic wildlife beneficial uses, and identified the incorporation of “performance standards based on habitat function,” as necessary to insure beneficial uses are restored (Sudol and Ambrose 2002).

1.10. References

Ambrose, R.F., Callaway, J.C. and S.F. Lee. 2007. An Evaluation of Compensatory Mitigation Projects Permitted Under Clean Water Act Section 401 by the California State Water Resources Control Board, 1991-2002. Prepared for the California Water Resources Control Board August 2007.

Arthington, A.H., Naiman, R.J., McClain, M.E. and C. Nilsson. 2010. Preserving the biodiversity and ecological services of rivers: new challenges and research opportunities. *Freshwater Biology* 55: 1-16.

Balmford, A., Bruner, A., Cooper, P., Costanza, R., Farber, S., Green, R.E., Jenkins, M., Jefferiss, P., Jessamy, V., Madden, J., Munro, K., Myers, N., Naeem, S., Paavola, J., Rayment, M., Rosendo, S., Roughgarden, J., Trumper, K. and R.K. Turner. 2002. Economic Reasons for Conserving Wild Nature. *Science* 297: 950-953.

Bolund, P. and S. Hunhammar. 1999. Ecosystem services in urban areas. *Ecological Economics* 29: 293-301.

Caltrans (California Department of Transportation). 2004. BMP Retrofit Pilot Program. Final Report. Report ID CTSW-RT-01-050.

Caltrans (California Department of Transportation). 2017. Construction Site Best Management Practices (BMP) Manual. CTSW-RT-17_314.18.1.

CalEPA (California Environmental Protection Agency). 2015. State Agency Greenhouse Gas Reduction Report Card.

California Geological Survey. 2012. Guidelines for Evaluating the Hazard of Surface Fault Rupture.

CDWR (California Department of Water Resources). 2012. Climate Action Plan Phase 1: Greenhouse Gas Emissions Reduction Plan.

CAOPR (California Office of Public Research). 2014. California Jurisdictions Addressing Climate Change.

CWMW (California Wetlands Monitoring Workgroup). 2013. California Rapid Assessment Method (CRAM) for Wetlands, Version 6.1 pp. 67

City of San Diego. 2015a. City of San Diego Climate Action Plan. Adopted December 2015.

City of San Diego. 2015b. Synthetic Pyrethroids Causal Assessment for the San Diego River. Tetra Tech, Inc.

County of San Diego. 2017. Draft Climate Action Plan. Planning Commission Informational Item. June 09, 2017.

Dwyer, J.F., McPherson, E.G., Schroeder, H.W. and R.A. Rowntree. 1992. Assessing the Benefits and Costs of the Urban Forest. *Journal of Arboriculture* 18(5): 227-234.

Elmqvist, T., Setälä, H., Handal, S.N., van der Ploeg, S., Aronson, J., Blignaut, J.N., Gomez-Baggethun, E., Nowak, D.J., Kronenberg, J. and R. de Groot. 2015. Benefits of restoring ecosystems services in urban areas. *Current Opinion in Environmental Sustainability* 14: 101-108.

Fetscher, A.E., Lunde, K., Stein, E.D. and J.S. Brown. 2015. Standard Operating Procedures (SOP) for Collection of Macroinvertebrates, Benthic Algae, and Associated Physical Habitat Data in California Depressional Wetlands. SWAMP-SOP-2015-0001.

Griffin, D.W. and C.A. Kellogg. 2004. Dust Storms and Their Impact on Ocean and Human Health: Dust in Earth's Atmosphere. *EcoHealth* 1: 284-295.

Herbst, D.B. 2002. Development of Biological Water Quality Targets for Assessment of Total Maximum Daily Load (TMDL) of Sediment in the Squaw Creek Watershed (Placer County, California). Final Report April 16, 2002. Contract #9-118-160-0.

Hester, E.T. and M.N. Gooseff. 2010. Moving Beyond the Banks: Hyporheic Restoration Is Fundamental to Restoring Ecological Services and Functions of Streams. *Environmental Science and Technology* 44: 1521-1525.

Horner, R.R., Guedry, J. and M.H. Kortenhof. 1990. Improving the Cost Effectiveness of Highway Construction Site Erosion and Pollution Control. Washington State Transportation Commission.

Intergovernmental Panel on Climate Change. 2001. Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change.

Karr, J.R. and E.W. Chu. 1999. Restoring Life in Running Waters. Island Press, Washington D.C.

Lewis, D.J., Lennox M., O'Geen, A., Creque, J., Evlner V., Larson, S., Harper, J., Doran, M. and K.W. Tate. 2015. Creek carbon: Mitigating greenhouse gas emissions through riparian restoration. University of California Cooperative Extension in Marin County. Novato, California. 26 pgs.

Loflen, C., Hettesheimer, H., Busse, L.B., Watababe, K., Gersberg, R.M., and V. Luderitz. 2016. Inadequate Monitoring and Inappropriate Project Goals: A Case Study on the Determination of Success for the Forester Creek Improvement Project. *Ecological Restoration* 34(2): 124-134.

Los Angeles Water Board (Los Angeles Regional Water Quality Control Board) 2016. Reconsideration of Certain Technical Elements of the Calleguas Creek Metals and Selenium TMDL. Staff Report Los Angeles Regional Water Quality Control Board August 9, 2016.

Myers, M. and R.F. Ambrose. 2015. Salt Marsh Reduces Fecal Indicator Bacteria Input to Coastal Waters in Southern California. *Bulletin of the Southern California Academy of Sciences*: Vol. 114 (2): 76-88.

NAS (National Academy of Sciences). 2004. Valuing Ecosystem Services Toward Better Environmental Decision Making. Report in Brief. The National Academies.

NMFS (National Marine Fisheries Services). 2014. California Eelgrass Mitigation Policy and Implementing Guidelines. NOAA October 2014.

NOAA (National Oceanic and Atmospheric Administration). 2011. Fisheries Economics of the United States: Economics and Sociocultural Status and Trends Series. U.S. Department of Commerce NOAA Technical Memorandum NMFS-F/SPO-128.

Ode, P.R., A.E., Fetscher, and L.B. Busse. 2016b. Standard Operating Procedures for the Collection of Field Data for Bioassessments of California Wadeable Streams: Benthic Macroinvertebrates, Algae, and Physical Habitat. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment SOP 004

OIA (Outdoor Industry Association). 2012. The Outdoor Recreation Economy: Take it Outside for California Jobs and a Strong Economy. Outdoorindustry.org

Poff, N.L., Allan, D.J., Bain, M.B., Karr, J.R., Prestegard, K.L., Richter, B.D., Sparks, R.E. and J.C. Stromberg. 1997. The Natural Flow Regime A paradigm for river conservation and restoration. *BioScience* 47(11): 769-784.

PSA (Perennial Stream Assessment). 2016. Region 9 Snapshot: Probabilistic Assessment Sites. Surface Water Ambient Monitoring Program.

Rehn, A.C., Mazor, R.D. and P.R. Ode. 2018. An Index to Measure the Quality of Physical Habitat in California Wadeable Streams. SWAMP Technical Memorandum SWAMP-TM-2018-0005.

San Diego Water Board. 2012. Resolution No. R9-2012-0069: Resolution in Support of a Regional Monitoring Framework.

San Diego Water Board. 2013. San Diego Water Board Practical Vision: A Strategic Plan. Resolution No. R9-2013-0153.

San Diego Water Board. 2013b. Memorandum to the City of San Diego on the Proposed Indirect Potable Reuse/Augmentation Project at San Vicente Reservoir. February 7, 2013.

San Diego Water Board. 2016. Clean Water Act Sections 305(B) and 303(D) Integrated Report for the San Diego Region. October 12, 2016.

SCCWRP (Southern California Coastal Water Research Project). 2016. Thematic Research Plan for Bioassessment. Revised May 2016. Approved by SCCWRP Commission June 2016.

Schiff, K., Gillet, G., Rehn, A. and M. Paul. 2015. Causal Assessment Evaluation and Guidance for California. SCCWRP Technical Report 750.

Sheaves, M., Baker, R., Nagelkerken, I. and R.M. Connolly. 2014. True Value of Estuarine and Coastal Nurseries for Fish: Incorporating Complexity and Dynamics. *Estuaries and Coasts* (38).

SMC (Stormwater Monitoring Coalition). 2015. Bioassessment of Perennial Streams in Southern California: A Report on the First Five Years of the Stormwater Monitoring Coalition. SCCWRP Technical Report 844.

Sudol, M.F. and R.F. Ambrose. 2002. The US Clean Water Act and Habitat Replacement: Evaluation of Mitigation Site in Orange County, California, USA. *Environmental Management* 30(5): 727-734.

State Water Board. (State Water Resources Control Board). 2009. Adoption of a Policy for Water Quality Control for Recycled Water. Resolution No. 2009-0011.

State Water Board. 2012. OWTS Policy: Water Quality Control Plan for Siting, Design, Operation, and Maintenance of Onsite Wastewater Treatment Systems. June 19, 2012.

State Water Board. 2013. Policy for Water Quality Control for Recycled Water. Resolution No. 2013-0003.

State Water Board. 2014. Order WQ 2014-0090-DWQ. General Waste Discharge Requirement for Recycled Water Use. Adoption Date June 03, 2014.

State Water Board. 2015. Amendment to the Water Quality Control Plan for the Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California.

Stein, E.D., Mazor, R.D., Sengupta, A., McCune, K., Bledsoe, B., Adams, S., Eberhart, S., Pyne, M., Ode, P. and A. Rehn. 2017a. Development of Recommended Flow Targets to Support Biological Integrity Based on Regional Flow-ecology Relationships for Benthic Macroinvertebrates in Southern California Streams. SCCWRP Technical Report 974.

Stein, E.D., Sengupta, A., Mazor, R.D., McCune, K., Bledsoe, B.P. and S. Adams. 2017b. Application of regional flow-ecology relationships to inform watershed management decisions: Application of the ELOHA framework in the San Diego River watershed, California, USA. *Ecohydrology* 10(7).

USDA (United States Department of Agriculture). National Best Management Practices for Water Quality Management on National Forest System Lands. Volume 1: National Core BMP Technical Guide.

USEPA (United States Environmental Protection Agency). 1991. Final Policy on Biological Assessments and Criteria.

USEPA. 2002. Biological Assessments and Criteria: Crucial Components of Water Quality Programs. EPA 822-F-02-006.

USEPA. 2008a. Chapter 3 in: Reducing urban heat islands: Compendium of strategies.

USEPA. 2008b. Managing Wet Weather with Green Infrastructure Municipal Handbook: Rainwater Harvesting Policies.

USEPA. 2012b. Aesthetics of Low Impact Development. EPA 841-N-12-003D • March 2012.

USEPA. 2012c. Costs of Low Impact Development: LID Saves Money and Protects Your Community's Resources. EPA 841-N-12-003C • March 2012

USEPA 2012d. Benefits of Low Impact Development: How LID Can Protect Your Community's Resources. EPA 841-N-12-003A • March 2012.

USEPA. 2015. Memorandum from Robert Perciasepe, Assistant Administrator, to Regional Administrators and Regional Water Division Directors Regarding Information Concerning 2016 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions. U.S. EPA Washington, D.C.

USEPA. 2016. Assessing the Benefits of Wetland Restoration: A Rapid Benefit Indicators Approach for Decision Makers. EPA/600/R-16/084 July 2016.