

**STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION**

STAFF REPORT FOR REGULAR MEETING OF MARCH 22-23, 2018

Prepared February 27, 2018

ITEM NUMBER: 11

SUBJECT: Amending the Water Quality Control Plan for the Central Coastal Basin to Adopt Total Maximum Daily Loads for Nitrogen and Phosphorus Compounds in Streams of the Franklin Creek Watershed

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THIS ACTION: Adopt Resolution No. R3-2018-0006

SUMMARY

Staff recommends the Central Coast Regional Water Quality Control Board (Central Coast Water Board) approve Resolution No. R3-2018-0006 (Attachment 1 to this staff report) that establishes Total Maximum Daily Loads (TMDLs) for nitrogen and phosphorus compounds (nitrate, total nitrogen, and total phosphorus) in streams¹ of the Franklin Creek watershed. Approval of this agenda item would result in amending the Water Quality Control Plan for the Central Coastal Basin (Basin Plan) to incorporate these TMDLs.

California's 2010 federal Clean Water Act section 303(d) List of impaired waterbodies lists Franklin Creek as impaired due to excessive nitrate concentrations. In addition, water quality data indicate that excessive nutrient inputs into Franklin Creek result in dissolved oxygen super-saturation and excessive algal biomass that are reflective of biostimulatory conditions. The proposed TMDL addresses these water quality issues by assigning allocations to the sources of nutrients in the watershed and providing an implementation plan to achieve those allocations.

DISCUSSION

Background

The federal Clean Water Act requires the State of California to identify waterbodies within its jurisdiction that are impaired and to develop TMDLs to address the impairments. The purpose of a TMDL project is to identify the pollutants causing impairment, to identify the sources of the impairment, and to allocate pollutant loads to sources of discharge. The TMDL assigns load allocations to nonpoint sources of pollution and wasteload allocations to point sources. The purposes of the allocations are to eliminate the impairments and restore the beneficial uses of surface waterbodies. TMDLs developed by the state also include implementation programs with a schedule to attain the TMDLs.

¹ In the context of this TMDL project "streams" refer to any body of running water (such as a creek, brook, slough, canal, ditch, ephemeral drainage) which flows on the earth's surface within the Franklin Creek watershed as shown on Figures 1 and 2.

Franklin Creek is one of three watersheds that drain into the Carpinteria Salt Marsh, located in southeastern Santa Barbara County. The Carpinteria Salt Marsh is a [Critical Coastal Area](#) as identified by multiple state and federal agencies in coordination with the California Coastal Commission. Figure 1 depicts the Carpinteria Salt Marsh watershed, its two named waterbodies, Franklin Creek and Santa Monica Creek, and several underground drainage conveyances (conduits) in the western portion of the watershed that transport water south, below U.S. Highway 101 and Southern Pacific Railroad, and ultimately into the salt marsh. The easternmost watershed shown in Figure 1 is Franklin Creek.

The Franklin Creek watershed encompasses an area of approximately 5 square miles in southeastern Santa Barbara County as shown in Figures 1 and 2, with a peak elevation of 1,250 feet. Major tributaries to the main channel of Franklin Creek include the East Branch, West Branch, and High School Creek. The upper watershed is primarily National Forest Land (chaparral) and the creek descends through lower lands comprised of orchards (avocado), agricultural (nurseries, greenhouses), and urban areas. The Franklin Creek subwatershed lies within Carpinteria Hydrologic Subarea (315.34).

Streams of the Franklin Creek watershed are impaired such that they do not support a range of beneficial uses, and the impairments therefore constitute serious water quality problems. Currently, designated drinking water supply (MUN), aquatic habitat (WARM, COLD, SPWN), and groundwater recharge² (GWR) beneficial uses are not being supported. For example, 272 of 288 water quality samples (95%) exceed the MUN water quality objective for nitrate. Franklin Creek also does not meet recommended guidelines (non-regulatory) for nitrate in agricultural supply water (AGR) for sensitive crop types, indicating that designated agricultural supply beneficial uses may be adversely impacted³. Also, the designated groundwater recharge beneficial uses of streams within the Franklin Creek watershed provide a nexus between water quality in surface water and groundwater because locally, stream reaches and the underlying groundwater resource are both designated for MUN and AGR beneficial uses.

Central Coast Water Board staff also evaluated the potential for violations of the Basin Plan's biostimulatory substances water quality objective. Biostimulation refers to a state of excess growth of algae due to anthropogenic nutrient inputs into an aquatic system. It is well established and well documented⁴ that nutrients (specifically nitrogen and phosphorus), in combination with other physical and environmental factors, can potentially contribute to excessive growth of algae and aquatic plants in rivers, streams, and coastal waterbodies. This excess algal biomass may then result in biostimulatory impairments of waterbodies by adversely affecting dissolved oxygen conditions, pH, and aquatic habitat. Staff's assessment indicates that seasonal biostimulatory impairments occur within the Franklin Creek watershed which are generally associated with the dry season (May through October).

Development and implementation of this TMDL should reduce or eliminate nitrate pollution that may impact human health (drinking water) and address degradation of aquatic habitat. This is consistent with the Central Coast Water Board's highest identified priorities:

² The Basin Plan GWR beneficial use explicitly states that the Central Coast Water Board must protect the designated groundwater recharge use of surface waters to maintain groundwater quality. As such, where necessary, the TMDL needs to protect the GWR beneficial uses of the surface waters to support and maintain the MUN or AGR beneficial uses of the underlying groundwater resource. Previously approved California TMDLs recognize the protection of the GWR beneficial use of surface waters.

³ High concentrations of nitrate in irrigation water can potentially create problems for sensitive crops (e.g., grapes, avocado, and citrus) by detrimentally impacting crop yield or quality.

⁴ See for example, US Environmental Protection Agency, 2000, Nutrient Criteria Technical Guidance Manual, Section 1.2 *Nutrient Enrichment Problems in Rivers and Streams*. EPA-822-B-00-002.

Central Coast Water Board's Top Two Priorities⁵

- 1) "Preventing and Correcting Threats to Human Health"
 - ✓ *Nitrate contamination in groundwater is by far the most widespread threat to human health in the central coast region*
- 2) "Preventing and Correcting Degradation of Aquatic Habitat"
 - ✓ *Including requirements for aquatic habitat protection in Total Maximum Daily Load Orders*

In addition, the U.S. Environmental Protection Agency (USEPA) reported that nitrogen and phosphorus pollution, and the associated degradation of drinking and environmental water quality, has the potential to become one of the costliest and most challenging environmental problems the nation faces⁶. More than half of the nation's streams, including Franklin Creek, have medium to high levels of nitrogen and phosphorus. According to USEPA, nitrate drinking water standard violations have doubled nationwide in eight years. Algal blooms, resulting from the biostimulatory effects of nutrients, are steadily on the rise nationwide and related toxins potentially have serious health and ecological effects. For example, researchers have implicated algal toxins originating from freshwater sources within the Pajaro River basin in the deaths of California southern sea otters⁷.

Central Coast Water Board staff has identified sources that are causing or contributing to water quality impairment; identified parties responsible for these sources; identified scientifically defensible numeric water quality targets; and proposed interim and final wasteload and load allocations necessary to achieve the TMDLs. The proposed wasteload and load allocations for nitrate, total nitrogen, and total phosphorus will ultimately result in attainment of water quality standards for streams within the Franklin Creek watershed.

The TMDL Report (attachment 2 to this staff report)⁵ contains further information outlining the technical and administrative basis for these TMDLs.

Data Sources

Central Coast Water Board staff used water quality data, land use data, hydrologic data, climatic data, geologic data, soils data, ecological data, groundwater data, and other types of environmental data obtained from numerous sources as described more fully in the TMDL Report.

Numeric Targets

The TMDL Report identifies numeric targets and uses them to ascertain when and where achievement of water quality objectives occurs, and hence, when the protection of designated beneficial uses of surface waters occurs. These numeric targets are describe below.

Target for Nitrate (human health standard): For impaired stream reaches that are required to support designated drinking water (MUN) and designated groundwater recharge (GWR) beneficial uses, the appropriate numeric target is a nitrate concentration of 10 mg/L (as nitrogen). This numeric target is equal to the Basin Plan's numeric nitrate water quality objective that is protective of drinking water beneficial uses.

⁵ See Staff Report for [Agenda Item 3](#) for the July 11, 2012 Central Coast Water Board meeting.

⁶ U.S. Environmental Protection Agency: Memorandum from Acting Assistant Administrator Nancy K. Stoner. March 16, 2011. Subject: "Working in Partnership with States to Address Phosphorus and Nitrogen Pollution through Use of a Framework for State Nutrient Reductions."

⁷ Miller, M.A., et al. 2010. Evidence for a Novel Marine Harmful Algal Bloom: Cyanotoxin (Microcystin) Transfer from Land to Sea Otters. PLoS ONE 5(9): e12576. doi:10.1371/journal.pone.0012576.

Targets for Biostimulatory Substances (nitrogen and phosphorus): The Basin Plan contains the following narrative water quality objectives for biostimulatory substances:

“Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.”

Because natural variability influences biostimulatory problems, uniform national or statewide numeric water quality criteria for nitrogen and phosphorus are not appropriate. Therefore, to implement the Basin Plan’s narrative objective for biostimulatory substances, the Central Coast Water Board must develop regional, technically defensible numeric water quality criteria to assess attainment or non-attainment of the narrative water quality objective. To develop this numeric water quality criteria, Central Coast Water Board staff evaluated data, studies, established methodologies, technical guidance, peer-reviewed numeric criteria, and other information to estimate the levels of nitrogen and phosphorus that can be present without causing violations of the Basin Plan biostimulatory substances objective.

Definitive and unequivocal scientific certainty is usually not possible, and is not necessary in a TMDL process that develops nutrient water quality targets protective against biostimulatory conditions. Numeric targets should be scientifically defensible, but are not required to be definitive. Biostimulation is an ongoing and active area of research. If changes to water quality objectives and numeric targets for biostimulatory substances occur in the future, then any TMDLs and allocations that are adopted for biostimulatory substances pursuant to this project may sunset and be superseded by revised water quality objectives.

For biostimulatory substances (total nitrogen and total phosphorus), Central Coast Water Board staff is proposing numeric targets that have been developed using a combination of recognized methodologies: USEPA-recommended statistical approaches and supplemented by the California Nutrient Numeric Endpoint (CA NNE) approach⁸. According to the USEPA, using a combination of recognized nutrient target development approaches results in numeric criteria of greater scientific validity⁹. Central Coast Water Board staff used the following technical guidance in nutrient target development:

- Use a combination of recognized approaches (i.e., literature values, statistical approaches, and predictive modeling approaches) results in criteria of greater scientific validity (source: USEPA, 2000. Nutrient Criteria Guidance Manual);
- Classify and group streams needing nutrient targets, based on similar characteristics (source: USEPA, 2000. Nutrient Criteria Guidance Manual); and
- Targets should not be lower than expected concentrations found in background/natural conditions (source: Tetra Tech, 2006. CA NNE guidance).

Central Coast Water Board staff is proposing seasonal biostimulatory water quality targets for total nitrogen of 1.1 mg/L in the dry season and 8.0 mg/L in the wet season based on technical guidance and established methodologies.

Central Coast Water Board staff is proposing seasonal biostimulatory water quality targets for total phosphorus of 0.075 mg/L in the dry season and 0.3 mg/L in the wet season based on technical guidance and established methodologies.

⁸ The California nutrient numeric endpoints (CA NNE) approach is a methodology for the development of nutrient numeric targets for use in the water quality programs of the California’s Water Boards. The CA NNE approach is a risk-based approach to evaluate algae and nutrient targets based on multiple lines of evidence; the intention of the CA NNE approach is to use nutrient response indicators to develop potential nutrient water quality criteria.

⁹ See U.S. Environmental Protection Agency (2000). *Nutrient Criteria Technical Guidance Manual – Rivers and Streams*. EPA-822-B-00-002.

Targets for Nutrient-Response Indicators (dissolved oxygen, chlorophyll a, and microcystins): Central Coast Water Board staff is also proposing dissolved oxygen, chlorophyll a, and microcystins numeric targets to ensure that streams do not show evidence of biostimulatory conditions, and to have primary indicator metrics to assess biological response to future nutrient water column concentration reductions. The TMDL Report discusses the nexus between nutrients and biological indicators such as dissolved oxygen, chlorophyll a, and microcystins.

- i. Dissolved oxygen targets: To protect the cold fresh water habitat (COLD) and spawning (SPWN) beneficial uses designations of Franklin Creek, the dissolved oxygen numeric targets are the same as Basin Plan numeric water quality objective, which states that dissolved oxygen concentrations shall not be reduced below 7.0 mg/L at any time. For tributaries not mentioned by a specific beneficial use, the dissolved oxygen numeric targets is the same as the Basin Plan numeric water quality objective, which states that dissolved oxygen concentrations shall not be reduced below 5.0 mg/L at any time. The Basin Plan contains an additional dissolved oxygen water quality objective that Central Coast Water Board staff proposes as a numeric target, whereby median dissolved oxygen shall not fall below 85% saturation. To address excessive dissolved oxygen gas super-saturation in the water column, Central Coast Water Board staff proposes a numeric target whereby dissolved oxygen concentrations are not to exceed 13 mg/L. This target is based on peer-reviewed research in California's central coast region¹⁰ and addresses the USEPA "Gold Book" water quality standard for excessive gas saturation.
- ii. Chlorophyll a target: Chlorophyll a is an algal biomass indicator. The Basin Plan does not contain numeric water quality objectives for chlorophyll a. A recent peer-reviewed study¹¹ conducted by the Central Coast Ambient Monitoring Program (CCAMP) reports that in the California central coast region, inland streams that do not show evidence of biostimulation all remained below the chlorophyll a threshold of 15 µg/L. As this value is consistent with several values reported in published literature and from other regulatory programs, and as the CCAMP study is central coast-specific, Central Coast Water Board staff proposes the numeric water quality target for chlorophyll a is 15 µg/L for all waterbodies (i.e., water column chlorophyll a concentrations not to exceed 15 µg/L).
- iii. Microcystin target: Microcystins are toxins produced by cyanobacteria (blue-green algae) and are associated with algal blooms and biostimulation in surface waterbodies¹². The Basin Plan does not contain numeric water quality objectives for microcystins. However, the California Office of Environmental Health Hazard Assessment (OEHHA) has published final microcystin public health action levels¹³ for human recreational uses of surface waters. This public health action level is 0.8 µg/L for human recreational uses of water. Therefore, Central Coast Water Board staff proposes a numeric water quality target for microcystins¹⁴ of 0.8 µg/L (i.e., microcystin not to exceed 0.8 µg/L). These targets are therefore protective of the water contact recreation (REC-1) designated beneficial uses of surface waters. Staff found no microcystin detections in streams of the Franklin Creek watershed or in the Carpinteria Salt Marsh. The TMDL identifies numeric targets for microcystins as an indicator metric to assess primary biological response to future nutrient water column

¹⁰ Worcester, K., D. M. Paradies, and M. Adams. 2010. *Interpreting Narrative Objectives for Biostimulatory Substances for California Central Coast Waters*. Surface Water Ambient Monitoring Program (SWAMP) Technical Report, July 2010.

¹¹ *Ibid.*

¹² See: U.S. Environmental Protection Agency. Drinking Water Treatability Database.

¹³ California Office of Environmental Health Hazard Assessment. 2012. *Toxicological Summary and Suggested Action Levels to Reduce Potential Adverse Health Effects of Six Cyanotoxins* (Final, May 2012).

¹⁴ Includes microcystins LA, LR, RR, and YR.

concentration reductions and to ensure compliance with the Basin Plan's biostimulatory substances objective and designated REC-1 beneficial uses.

Source Analysis

Central Coast Water Board staff conducted source analyses to identify the contributing sources of nitrogen and phosphorus compounds to streams of the Franklin Creek watershed. Nitrogen and phosphorus compounds originate from irrigated agriculture, urban lands, stormwater sources, and natural sources. The TMDL assigns these source categories allocations for nitrate, total nitrogen and total phosphorus to achieve the TMDLs. Central Coast Water Board staff estimates that irrigated agriculture contributes the majority of controllable nutrient loads to streams in the Franklin Creek watershed and this source category is not currently meeting its proposed load allocation.

TMDLs and Allocations

Practically speaking, a TMDL is basically a pollutant budget¹⁵ (aka, the "loading capacity"¹⁶ in Clean Water Act terminology) for a surface waterbody. The TMDL distributes, or "allocates" the waterbody's loading capacity among the various sources of that pollutant. Pollutant sources characterized as point sources receive wasteload allocations¹⁷, nonpoint sources of pollution receive load allocations¹⁸. TMDLs also include a margin safety to account for uncertainty.

In these proposed TMDLs, owners and operators of irrigated lands, National Pollutant Discharge Elimination System (NPDES)-permitted municipal stormwater entities, NPDES-permitted industrial and construction stormwater entities, and natural sources are assigned nitrate, total nitrogen, and total phosphorus allocations equal to the water quality numeric targets outlined previously in this staff report.

The proposed TMDLs are concentration-based. This means the TMDLs are equal to the receiving water numeric water quality targets described in the numeric target section above. Concentration-based TMDLs are an appropriate expression of TMDLs and meet USEPA requirements for TMDL approval¹⁹. Concentration-based allocations are also the most appropriate linkage to the loading capacities of streams in the river basin because drinking water and aquatic habitat beneficial uses are supported based on concentration-based thresholds. Therefore, each wasteload allocation and load allocation for these TMDLs are equal to the concentration-based nitrate, total nitrogen, and total phosphorus receiving water targets.

The nitrate TMDL for all reaches of Franklin Creek required to support MUN beneficial uses is:

- Nitrate concentration shall not exceed 10 mg/L as nitrogen in receiving waters.

¹⁵ See: Water Research Foundation in collaboration with USEPA, 2010. *Drinking Water Source Protection Through Effective Use of TMDL Process*.

¹⁶ The loading capacity is the greatest amount of a pollutant that a waterbody can assimilate and still meet water quality standards.

¹⁷ The portion of a receiving water's loading capacity allocated to NPDES-permitted point sources of pollution.

¹⁸ The portion of the receiving water's loading capacity attributed to (1) nonpoint sources of pollution and (2) natural background sources.

¹⁹ According to USEPA guidance, states should report TMDLs on a *daily* time step basis (e.g., allowable pounds of pollutant per day). Concentration-based TMDLs may be appropriate where there is only limited amounts of daily flow data, which thus limits the ability to calculate a reliable daily time-step allowable pollutant load in stream reaches. There could also be a high degree of error associated with trying to estimate daily flows from limited amounts of instantaneous flow measurements. According to USEPA, the potential for error in flow estimates is particularly pronounced in arid areas, in areas with few USGS stream gages, and in areas where flows are highly modified by human activities (e.g., impoundments, regulated flows, and irrigation return flows). Therefore, according to USEPA, TMDLs based on instantaneous concentration-based loads can satisfy the federal guidance to incorporate a daily time-step pollutant load.

The total nitrogen and total phosphorus TMDLs for all reaches of Franklin Creek required to support aquatic life are:

- For dry season (May 1 to October 31): Total nitrogen concentration shall not exceed 1.1 mg/L in receiving waters; total phosphorus concentration shall not exceed 0.075 mg/L in receiving waters; and
- For wet season (November 1 to April 30): Total nitrogen concentration shall not exceed 8.0 mg/L in receiving waters; total phosphorus concentration shall not exceed 0.3 mg/L in receiving waters.

The TMDLs establish attainment of final load allocations by 25 years after the Office of Administrative Law approves the TMDL. To assess progress towards achieving the final allocations, Central Coast Water Board staff is proposing attainment of some allocations sooner than others. Nitrate allocations protective of the MUN beneficial use shall be attained in 10 years, wet-season total nitrogen and total phosphate allocations protective of biostimulatory substances shall be attained in 15 years, and the more stringent dry-season total nitrogen and total phosphate allocations protective of biostimulatory substances shall be attained in 25 years.

Implementation Strategy

Irrigated Agriculture: Central Coast Water Board staff estimates that nutrient loads from irrigated lands are the largest source category of nutrient loading to waterbodies in the Franklin Creek watershed. Therefore, to achieve the proposed load allocations for irrigated lands, implementation of management measures will need to occur. At this time, Central Coast Water Board staff proposes that implementation and compliance with the conditions and requirements of the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Agricultural Order) and any renewals or revisions thereof, would be sufficient evidence that implementation of the TMDLs and load allocations for irrigated lands has occurred. Owners and operators are required to comply with the requirements of the Agricultural Order and subsequent revisions of the Agricultural Order. Central Coast Water Board staff will prioritize implementation efforts in the Franklin Creek watershed aimed at addressing discharges of nutrients as described in the TMDL Report.

The goals of implementing these load allocations are:

- Control discharges of nitrate to impaired waterbodies and groundwater²⁰; and
- Implement management practices capable of achieving load allocations identified in this TMDL and demonstrate progress towards achieving load allocations during the TMDL implementation phase.

NPDES-Permitted Municipal Stormwater System Discharges (MS4 entities): Municipal separate storm sewer systems (MS4s) NPDES stormwater permits will implement wasteload allocations for this source category. The TMDL considers MS4s as relatively minor loads of nitrogen and phosphorus compounds in the Franklin Creek watershed as a whole, based on Central Coast Water Board staff's source analysis and available municipal storm drain runoff water quality data. However, because these sources can potentially have significant localized effects on water quality, the MS4s will be assigned wasteload allocations. The Central Coast Water Board will address nitrogen and phosphorus compounds discharged from the MS4 systems within the Franklin Creek watershed under the provisions of the State Water Resource Control Board's General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (Order No. 2013-0001-DWQ, NPDES No. CAS000004), or any subsequent permit renewals. MS4 entities in the Franklin Creek watershed include the City of Carpinteria and Santa Barbara County.

²⁰ Staff identifies shallow, recently-recharged groundwater in this TMDL as a significant source contributor of nitrate loads to streams within the Franklin Creek watershed.

To address the MS4 wasteload allocations, the Central Coast Water Board will require MS4 enrollees that discharge to surface waterbodies impaired by excess nutrients or by biostimulation to address these impairments by developing and implementing a Wasteload Allocation Attainment Program. The Wasteload Allocation Attainment Program will contain steps the MS4 will take to assess its contribution, develop a list of likely sources, prioritize them, develop and implement best management practices targeting those sources, and assess the effectiveness of the practices. The TMDL presumes MS4 entities that discharge to surface waterbodies that are currently not impaired by nutrients and biostimulation are meeting their wasteload allocations at this time, and thus not required to develop a Wasteload Allocation Attainment Program for nutrients. However, because anti-degradation is an element of all water quality standards, these entities should continue to implement their stormwater programs, and comply with the General Permit or any subsequent permits with the goal of maintaining existing nutrient water quality and helping to prevent any further water quality degradation²¹.

NPDES-Permitted Industrial and Construction Stormwater Discharges: Based on evidence and information provided in the TMDL Report, staff does not expect that NPDES stormwater-permitted industrial facilities and construction sites in the Franklin Creek watershed are a significant risk or cause of the observed nutrient water quality impairments. These types of facilities are generally expected to be currently meeting proposed wasteload allocations. Therefore, staff has not identified additional regulatory measures for this source category at this time.

To maintain existing water quality and prevent any further water quality degradation, these permitted industrial facilities and construction operators shall continue to implement and comply with the requirements of the statewide Industrial General Permit (Order No. 2014-0057-DWQ, NPDES No. CAS000001 or subsequent renewals) or the Construction General Permit (Order No. 2012-0006-DWQ, NPDES No. CAS000002, or subsequent renewals), respectively.

The information outlined in the TMDL Report does not conclusively demonstrate that stormwater from all industrial facilities and construction sites are meeting proposed wasteload allocations. More information will be obtained during the implementation phase of these TMDLs to further assess the level of nutrient contributions to surface waters from these source categories, and to identify any further regulatory actions, if warranted, to reduce nutrient loading.

Time Schedule for Tracking Progress and Achieving the TMDLs

Discharges of nitrogen and phosphorus compounds are occurring at levels which are impairing a wide number of beneficial uses and, therefore, constitute a serious water quality problem. As such, implementation should occur at a pace to achieve the allocations and TMDL in the shortest timeframe feasible.

Because of the nature, scale, and magnitude of the water quality problem, Central Coast Water Board staff is proposing interim temporal benchmarks to establish progress towards achievement of the final wasteload allocations and load allocations. These benchmarks can be summarized as follows:

- First Interim Wasteload and Load Allocations: Achieve the MUN nitrate standard within 10 years of the effective date of the TMDL (which is upon approval by the Office of Administrative Law).
- Second Interim Wasteload and Load Allocations: Achieve the wet-season (November 1 to April 30) nutrient biostimulatory target-based allocations within 15 years of the effective date of the TMDL.

²¹ Consistent with USEPA guidance and Central Coast Water Board priorities, the goals of these TMDLs are to rectify nutrient-impaired streams *and* to prevent any further degradation in streams currently achieving or "better than" applicable nutrient water quality standards.

- Final Interim Wasteload and Load Allocations: Achieve the more stringent dry-season (May 1 to October 31) nutrient biostimulatory target-based allocations within 25 years of the effective date of the TMDL.

The 10-year timeframe to achieve the MUN nitrate standard is based primarily on the expectation that nearly all landowners and operators of irrigated agricultural activities will be implementing management practices in accordance with the Agricultural Order (Order R3-2017-0002) adopted on March 8, 2017. It may take a few years to realize the water quality benefits resulting from implementing nutrient-control management measures (e.g., grass swales and riparian buffers). Ten years for the first interim wasteload and load allocations is a reasonable timeframe to implement management measures and reduce nitrate levels consistent with allocations and the numeric targets.

The TMDL identifies the 15-year time frame to achieve the second interim wasteload and load allocations (based on the wet-season nutrient biostimulatory targets) as a reasonable time frame and intermediate benchmark prior to achieving the more-stringent final allocations. The basis for this timeline is that staff anticipates the full effect of source controls (nutrient and irrigation efficiency improvements) and surface runoff treatment systems (e.g., constructed wetlands and buffer strips) to be manifested and reflected in water quality response within 15 years. Staff expects that surface water quality improvement will occur more rapidly due to source control and runoff treatment than improvements to shallow groundwater quality. As noted previously, shallow groundwater is a contributing source of nutrients to surface waters; shallow groundwater moves slowly, and nitrate-contaminated shallow groundwater will require a longer time frame to respond to the full effects of source control measures.

Staff based the 25-year timeline to meet more-stringent dry-season biostimulatory substances allocations on estimates that legacy nutrient loads, which are unrelated to current practices and are originating from groundwater and baseflow, will likely continue to contribute elevated nutrients to Franklin Creek surface waters for several decades. Therefore, Central Coast Water Board staff anticipates that it will take a significant amount of time for legacy pollutant loads in shallow groundwater, and the subsequent baseflow pollutant loads to stream reaches, to attenuate to acceptable levels consistent with the final TMDL allocations^{22,23}.

Reconsideration of the TMDL

Additional monitoring and voluntary special studies would be useful to evaluate the uncertainties and assumptions made in the development of this TMDL. Nutrient enrichment is an active area of research. Consequently, ongoing scientific research on eutrophication and biostimulation may further inform the Central Coast Water Board regarding wasteload or load allocations that protect against biostimulatory impairments, inform the development of appropriate implementation timelines, and inform the assessment of potential downstream impacts. At this time, based on the information and analyses presented in the TMDL Report, Central Coast Water Board staff maintains there is sufficient information to begin to implement the TMDL and make progress towards attainment of water quality standards and the proposed allocations. However, in recognition of the uncertainties regarding nutrient pollution and biostimulatory

²² For example, the U.S. Geological Survey (USGS) reports that in spite of many years of efforts to reduce nitrate levels in the Mississippi River Basin, concentrations have not consistently declined during the past two decades. USGS concludes that elevated nitrate in shallow groundwater is a substantial source contributing to nitrate concentrations in river water. Because nitrate moves slowly through groundwater systems to rivers, the full effect of management strategies designed to reduce loading to surface waters and groundwaters may not be seen in these rivers for decades (see *"No Consistent Declines in Nitrate Levels in Large Rivers of the Mississippi River Basin"* USGS News Release dated 08/09/2011).

²³ For example, in a recent national study USGS researchers reported that legacy nutrients present in shallow groundwater may sustain high nitrate levels in some streams characterized by substantial groundwater inputs for decades to come (see Tesoriero, Duff, Saad, Spahr, and Wolock, 2013, *Vulnerability of Streams to Legacy Nitrate Sources*. Environmental Science and Technology, 2013, 47(8), pp. 3623-3629).

impairments, Central Coast Water Board staff proposes that the Central Coast Water Board may reconsider the wasteload and load allocations, if merited by optional special studies and new research, eight years after the effective date of the TMDL.

ENVIRONMENTAL SUMMARY

The California Resources Agency has certified the basin planning process in accordance with section 21080.5 of the Public Resources Code and therefore the process is exempt from Chapter 3 of the California Environmental Quality Act (CEQA). If Chapter 3 applied to the TMDL, an Environmental Impact Report may have been required for the TMDL project. The analysis contained in the TMDL Report, and the CEQA Checklist and Analysis (attachment 3 to this staff report) comply with the requirements of the State Water Board's certified regulatory CEQA Substitute Environmental Documentation process, as set forth in California Code of Regulations, Title 23, section 3775 et seq. Furthermore, the analysis fulfills the Central Coast Water Board's obligations for the adoption of regulations "requiring the installation of pollution control equipment, or a performance standard or treatment requirement," as set forth in section 21159 of the Public Resources Code. Staff considered all public comments.

Public Resources Code section 21159 provides that an agency shall perform, at the time of the adoption of a rule or regulation requiring the installation of pollution control equipment or a performance standard or treatment requirement:

- An environmental analysis of the reasonably foreseeable methods of compliance;
- An analysis of the reasonably foreseeable environmental impacts of the methods of compliance;
- An analysis of reasonably foreseeable mitigation measures to lessen the adverse environmental impacts; and
- An analysis of reasonably foreseeable alternative means of compliance with the rule or regulation that would have less significant adverse impacts.

Section 21159(c) requires that the environmental analysis take into account: a reasonable range of environmental, economic, and technical factors; population and geographic areas; and specific sites.

The CEQA Checklist and Analysis provides the environmental analysis required by Public Resources Code section 21159. The CEQA Checklist and Analysis identifies reasonably foreseeable methods of compliance with the TMDL and specifies whether there are any anticipated impacts to the environment associated with the reasonably foreseeable methods of compliance.

The CEQA Checklist and Analysis provides the necessary information pursuant to state law to conclude that the proposed TMDL, implementation plan, and the associated reasonably foreseeable methods of compliance may have a significant adverse effect on the environment as described below. Central Coast Water Board staff has made this determination based on best available information in an effort to fully inform the interested public and the decision makers of potential environmental impacts.

Potentially Significant Environmental Impacts

Regulations define a significant effect on the environment as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project."²⁴ The CEQA Checklist and Analysis provides the necessary information pursuant to state law to conclude that the proposed TMDL, Implementation Plan, and the associated reasonably foreseeable methods of compliance

²⁴ Title 14 California Code of Regulations Section 15382.

will not have significant adverse effects on the environment with the exception of potentially significant impacts associated with Biological Resources CEQA Checklist Category IV(a), *potentially* significant impacts to habitat of fish or wildlife species. Central Coast Water Board staff has made this determination based on best available information in an effort to fully inform the interested public and the decision makers of potential environmental impacts.

While wildlife and/or sensitive or endangered species are found on or adjacent to lands which may require compliance measure to implement the TMDL, there are also likely negative effects on these species because of current water quality degradation and excess nutrients associated with agricultural discharges. In other words, while rare, sensitive, threatened, or endangered species may be present in areas which may require compliance measures, dissolved oxygen imbalances and water quality degradation are not considered to be a desirable condition for the health and long term sustainability of these species. Consequently, while sensitive species or other wildlife may be present in some areas because of the discharged water, continuing to discharge water of low quality is not an environmentally-desirable or sustainable practice with respect to the viability of sensitive species.

It is important to note that nutrient control strategies and measures have been underway for many years in various agricultural watersheds throughout the United States and in Europe. Based on the literature, research, and information Central Coast Water Board staff has surveyed for this project, we are unaware of any cases where nutrient control strategies have been directly responsible for substantial or widespread adverse impacts resulting in the degradation of the environment, substantial reductions in the habitat of fish and wildlife, or have caused a fish or wildlife population to drop below self-sustaining levels, threatened to eliminate a plant or animal community, or reduced the number or restrict the range of a rare or endangered plant or animal.

Alternative Analysis

The TMDL CEQA Checklist and Analysis also includes consideration of alternatives to the TMDLs. The program alternatives considered were: a) no action alternative, b) mass load-based TMDL alternative, and c) TMDLs for nitrogen and phosphorus compounds.

Statement of Overriding Consideration

The Central Coast Water Board, when considering approval of Basin Plan amendments will balance the economic, legal, social, technological, or other benefits of TMDL implementation against the potentially significant adverse effects when determining whether to approve the Basin Plan amendment. The Central Coast Water Board has the authority, pursuant to CEQA guidelines Section 15093 (14 California Code of Regulations § 15093), to make a statement of overriding considerations, if it finds that the adverse environmental effects are acceptable given the identified benefits.

For this agenda item, staff recommends that the Central Coast Water Board approve a statement of overriding consideration (as articulated in Section 8 of the CEQA Checklist and Analysis). The statement of overriding consideration finds that the benefits of the *Total Maximum Daily Loads for Nitrogen and Phosphorus Compounds in Streams of the Franklin Creek Watershed* (Resolution No. R3-2018-0006) override and outweigh the potential significant adverse impacts of these TMDLs, for the reasons more fully set forth in the staff report and attachments.

ANTI-DEGRADATION

The Basin Plan amendment is consistent with the provisions of the State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California" and title 40, Code of Federal Regulations §131.12. The adoption of the proposed Basin Plan amendment and TMDL implementation plan will not de-designate or limit beneficial use designations, will not relax any water quality standard, and will not result in lowering of water quality. The proposed Basin Plan amendment will result in water quality improvements; therefore, state and federal anti-degradation analyses are not required.

SCIENTIFIC PEER REVIEW

Health and Safety Code section 57004 requires external scientific peer review for certain water quality control policies. Policy and guidance for peer review states that scientific review is not required if a new application of an adequately peer reviewed work product does not significantly depart from the reviewed approach²⁵. The State of California and USEPA have approved several TMDLs where the scientific basis came from previously reviewed TMDLs, thereby negating the need for further review; such a practice is in the best interest of conserving and efficiently utilizing state resources.

Staff based the scientific portions of this TMDL exclusively on the TMDLs for Nitrogen Compounds and Orthophosphate in the lower Salinas River and Reclamation Canal Basin, and the Moro Cojo Slough subwatershed that underwent the required external scientific peer review. As a result, the scientific portions of this TMDL have already undergone external, scientific peer review. Consequently, the Central Coast Water Board has fulfilled the requirements of Health and Safety Code section 57004, and the proposed amendment does not require further peer review.

PUBLIC INVOLVEMENT

Over the past two years, staff of the Central Coast Water Board has implemented a process to inform and engage interested persons about this TMDL project. We provided regular TMDL updates and solicited public feedback via our stakeholder email subscription list consisting of 70 stakeholders representing a wide range of interests. We periodically posted interim TMDL progress reports on the Central Coast Water Board's website with the intent of sharing our progress with stakeholders as we moved forward with TMDL development. We conducted public workshops in the City of Carpinteria in February 2016, June 2016, and September 2017. Staff held CEQA stakeholder scoping meetings on June 10, 2016 and September 20, 2017. Central Coast Water Board staff addressed questions and comments from attendees.

Individuals and entities that Central Coast Water Board staff engaged with during public workshops, CEQA scoping meetings, or during TMDL development included the following:

- City of Carpinteria staff
- County of Santa Barbara staff
- Representatives Santa Barbara Channelkeeper
- Representatives from University of California Natural Reserve System
- Representatives of commercial farms, orchards, greenhouses, nurseries, and ranches
- Other individuals and local residents interested in Franklin Creek and Carpinteria Salt Marsh water quality

²⁵ State of California: Unified California Environmental Protection Agency Policy and Guiding Principles For External Scientific Peer Review, March 13, 1998.

PUBLIC COMMENTS

This staff report and the resolution, TMDL report, and CEQA checklist and analysis were available for formal public comment on December 15, 2017. Written comments were due at the Central Coast Water Board office by 5:00 p.m. on January 29, 2018. The Central Coast Water Board did not receive any comments during the public comment period.

RECOMMENDATION

Adopt Resolution No. R3-2018-0006 as proposed to approve Total Maximum Daily Loads for Nitrogen and Phosphorus Compounds in Streams of the Franklin Creek Watershed.

FIGURES

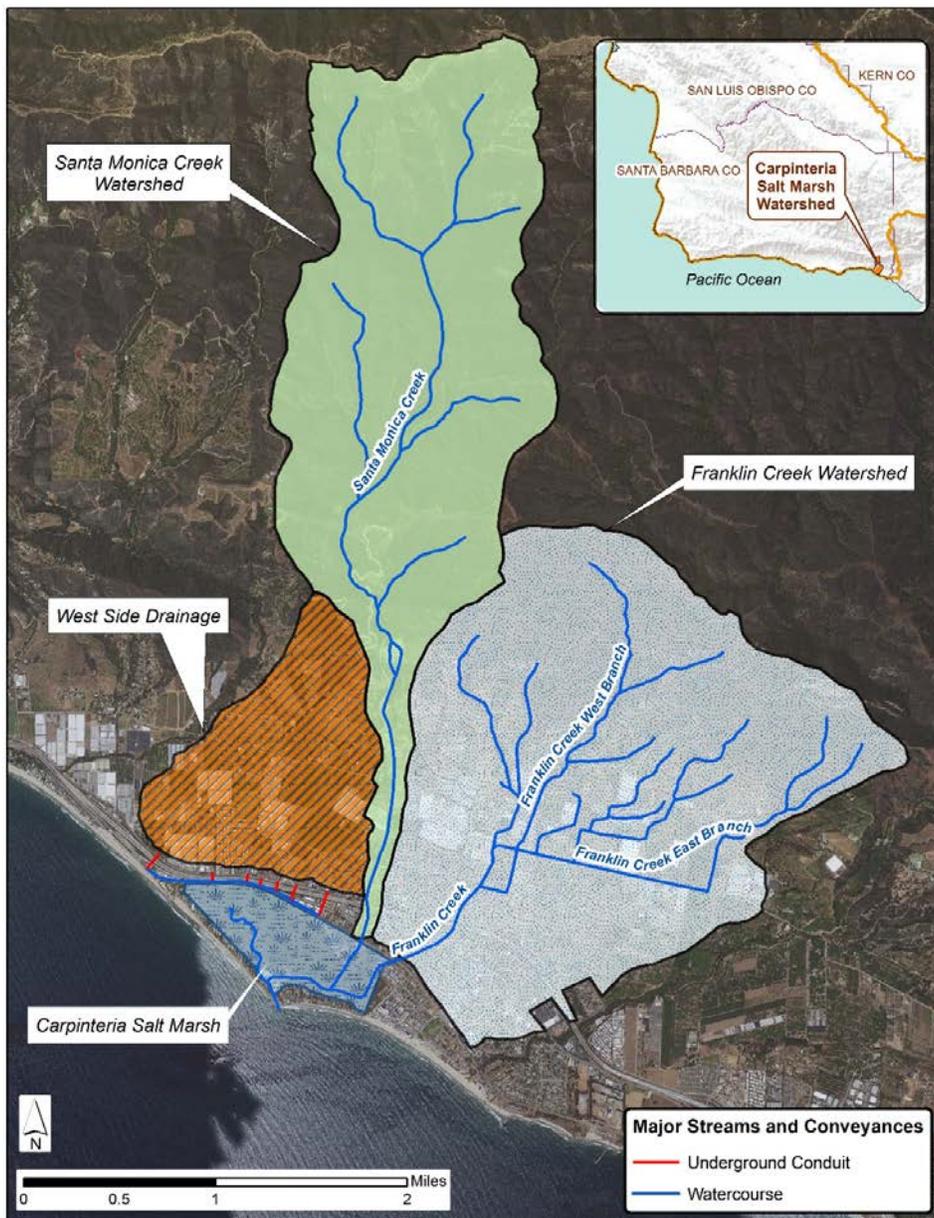


Figure 1. Drainages of the Carpinteria Salt Marsh watershed.

Spatial data source for watersheds and streams: South Coast Watershed Map (Easterly Section), Santa Barbara County Flood Control and Water Conservation District, 1975.

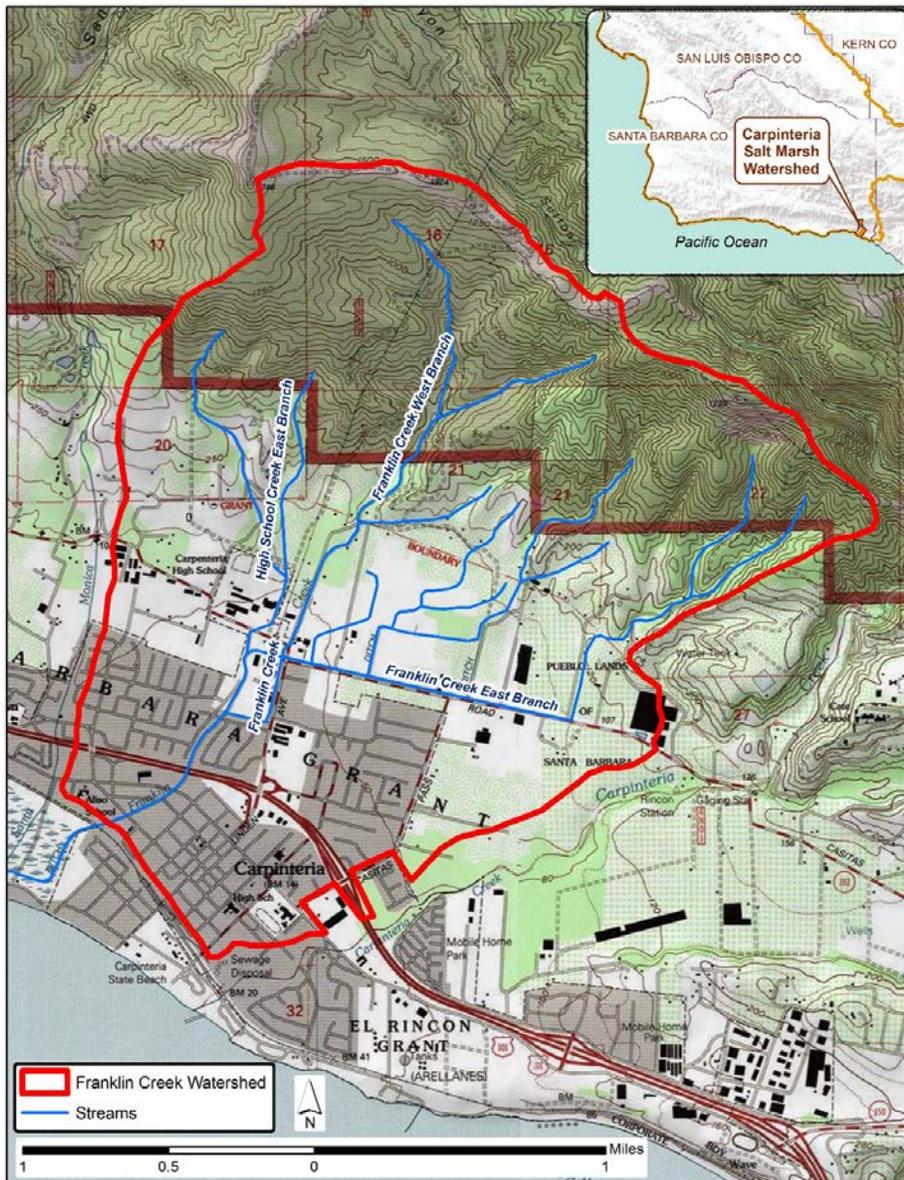


Figure 2. Franklin Creek watershed and streams.

ATTACHMENTS

The Central Coast Water Board website contains the five attachments to this staff report:

https://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/carpinteria_marsh/index.shtml

1. Resolution No. R3-2018-0006 and Basin Plan Amendment Language
2. TMDL Report: "Total Maximum Daily Loads for Nitrogen and Phosphorus Compounds in Streams of the Franklin Creek Watershed" (Includes Appendix A - C)
 - a. Appendix D – Water Quality Data Tables (please see website for this attachment)
3. California Environmental Quality Act (CEQA) Checklist and Analysis (please see website for this attachment)
4. Notice of Opportunity for Public Comment
5. Notice of Public Hearing