

**STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING SESSION – CENTRAL COAST REGIONAL WATER BOARD
APRIL 5, 2016**

ITEM 2

SUBJECT

CONSIDERATION OF A PROPOSED RESOLUTION APPROVING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE CENTRAL COASTAL BASIN (BASIN PLAN) TO ADOPT TOTAL MAXIMUM DAILY LOADS FOR NITROGEN COMPOUNDS AND ORTHOPHOSPHATE IN STREAMS OF THE PAJARO RIVER BASIN

DISCUSSION

On July 30, 2015, the Central Coast Regional Water Quality Control Board (Central Coast Water Board) adopted [Resolution No. R3-2015-0004](#) amending the Water Quality Control Plan for the Central Coastal Basin (Basin Plan) to establish total maximum daily loads (TMDLs) for nitrogen compounds and orthophosphate in streams¹ of the Pajaro River basin.

The Pajaro River basin encompasses approximately 1,300 square miles, and includes parts of Santa Clara, Santa Cruz, San Benito, and Monterey counties. The river basin includes the Pajaro River and its tributaries, including the San Benito River, Pacheco Creek, Llagas Creek, Uvas Creek, Corralitos Creek, and Watsonville Slough.

The Central Coast Water Board's goals for establishing these TMDLs are to: 1) establish the nitrate, un-ionized ammonia, and orthophosphate loading capacities in streams of the Pajaro River basin in accordance with Clean Water Act requirements; and 2) recommend a strategy to reduce loading of these pollutants in streams to acceptable levels, thereby ultimately rectifying the identified water quality impairments.

Nutrient pollution of surface waters has long been recognized as a problem in some parts of the Pajaro River basin². Fifteen streams within the Pajaro River basin are listed on the 2008-2010 section 303(d) list for water quality impairments due to nitrate and nutrient-related water quality problems such as low dissolved oxygen, and chlorophyll a (an algal biomass indicator) impairments.

Central Coast Water Board staff also evaluated the potential for violations of the Basin Plan's biostimulatory substances water quality objective. Biostimulation³ 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

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

² See for example, Central Coast Regional Water Quality Control Board. 1983. *Consideration of Basin Plan Nutrient Objectives for Pajaro River and Llagas Creek*. Staff Report dated December 15, 1983.

³ The term "biostimulation" may be considered to be synonymous or interchangeable with the term "eutrophication". California central coast researchers have noted that the word "eutrophication" is problematic because it lacks scientific specificity. Thus, these researchers recommend that the regional water quality control boards not use the word (see Rollins, Los Huertos, Krone-Davis, and Ritz, 2012, *Algae Biomonitoring and Assessment for Streams and Rivers of California's Central Coast*).

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

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, pH, and aquatic habitat. Central Coast Water Board staff's assessment indicates that seasonal biostimulatory impairments occur locally in parts of the Pajaro River basin, and are generally associated with the dry season (May through October).

Based on the aforementioned information, a range of beneficial uses are not supported in numerous streams of the river basin, and the impairments therefore constitute serious water quality problems.

Also noteworthy is that the U.S. Environmental Protection Agency (U.S. EPA) reports 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 faces⁵. More than half of the nation's streams, including some streams in the Pajaro River basin, have medium to high levels of nitrogen and phosphorus. According to U.S. EPA, nitrate drinking water standard violations have doubled nationwide in eight years. Algal blooms, resulting from the biostimulatory effects of nutrients (specifically, nitrogen and phosphorus), are steadily on the rise nationwide; related toxins have potentially serious health and ecological effects.

Pollutant Sources

Discharges of nitrogen compounds and phosphorus originating from irrigated agriculture, urban lands, stormwater sources, wastewater treatment facilities, grazing lands, golf courses, natural sources, and atmospheric deposition are contributing nutrient loads to streams in the river basin. These source categories are assigned allocations for nitrate, total nitrogen, un-ionized ammonia, and orthophosphate to achieve the TMDLs. Central Coast Water Board staff estimates that irrigated agriculture contributes the majority of controllable nutrient loads to streams in the Pajaro River basin. To establish additional independent lines of supporting evidence, Central Coast Water Board staff compared our source analysis to conclusions reached by other scientists in previous nutrient-water quality studies in the Pajaro River basin. Note that other researchers have similarly concluded that agriculture is the dominant source of nutrient loading to surface waters and groundwaters of the Pajaro River basin,^{6,7} thus providing a qualitative weight-of-evidence approach to this TMDL project and adding a measure of confidence to our nutrient source analysis.

⁵ 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".

⁶ Los Huertos, M., L. Gentry, and C. Shennan. 2003. Land Use and Water Quality on California's Central Coast: Nutrient Levels in Coastal Waterways. University of California, Santa Cruz Center for Agroecology & Sustainable Food Systems, Research Brief #2.

⁷ Williamson et al. San Jose State University Department of Civil Engineering and Applied Mechanics and Merritt Smith Consulting. 1994. The Establishment of Nutrient Objectives, Sources, Impacts, and Best Management Practices for the Pajaro River and Llagas Creek. Final Report. Prepared for California State Water Resources Control Board and the Regional Water Quality Control Board, Central Coast Region. Contract Number 0-212-253-0.

Water Quality Targets

Numeric targets are water quality thresholds. Numeric targets are identified and used to ascertain when and where water quality objectives are achieved, and hence, when designated beneficial uses of surface waters are protected.

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 (as nitrogen) concentration of 10 mg/L. This numeric target is equal to the Basin Plan's numeric nitrate water quality objective that is protective of drinking water beneficial uses.

Target for Un-ionized Ammonia (toxicity)

For un-ionized ammonia (a nitrogen compound), Central Coast Water Board staff is proposing a numeric target of 0.025 mg/L (as nitrogen) for this TMDL, which is equal to the Basin Plan's un-ionized ammonia numeric water quality objective that is protective against toxicity in surface waters.

Targets for Biostimulatory Substances (nitrate and orthophosphate)

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 state-wide 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 technically defensible numeric water quality criteria to assess attainment or non-attainment of the narrative water quality objective. To develop this narrative objective, Central Coast Water Board staff evaluated available 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 not necessary in a TMDL process for development of nutrient water quality targets protective against biostimulation. Numeric targets should be scientifically defensible, but are not required to be definitive. Biostimulation is an ongoing and active area of research. If the water quality objectives and numeric targets for biostimulatory substances are changed 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 (nitrate and orthophosphate), Central Coast Water Board staff is proposing numeric targets which were developed using a combination of recognized methodologies: U.S. EPA-recommended statistical approaches and supplemented by the California nutrient numeric endpoint (CA NNE) approach⁸. According to the U.S. EPA, using a combination of recognized nutrient target development approaches results in numeric criteria of greater scientific validity.⁹ A summary of technical guidance used by Central Coast Water Board staff in nutrient target development is presented below:

SUMMARY OF PUBLISHED TECHNICAL GUIDANCE USED BY STAFF IN NUTRIENT TARGET DEVELOPMENT:

-Using a combination of recognized approaches (i.e., literature values, statistical approaches, and predictive modeling approaches) results in criteria of greater scientific validity (source: U.S. EPA, 2000. *Nutrient Criteria Guidance Manual*);

-Classify and group streams needing nutrient targets, based on similar characteristics (source: U.S. EPA, 2000. *Nutrient Criteria Guidance Manual*); and

-Targets should not be lower than expected concentrations found in background/natural conditions (source: CA NNE guidance – Tetra Tech, 2006).

Based on technical guidance and established methodologies, Central Coast Water Board staff is proposing seasonal biostimulatory water quality targets for nitrate and total nitrogen which range by waterbody type-category¹⁰ from 1.1 mg/L to 3.9 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 orthophosphate which range by waterbody type-category from 0.04 mg/L to 0.14 mg/L in the dry season and 0.3 mg/L in the wet season.

Central Coast Water Board staff is also proposing dissolved oxygen, chlorophyll a, and microcystins as secondary numeric water quality 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.

TMDL Allocations

Practically speaking, a TMDL is basically a pollutant budget¹¹ (aka, the “loading capacity”¹² in Clean Water Act terminology) for a surface waterbody. TMDLs distribute, or “allocate” the

⁸ The California nutrient numeric endpoints (CA NNE) approach was developed as 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 in which algae and nutrient targets can be evaluated 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.

¹⁰ Waterbody categories in this TMDL project include: Alluvial basin floor and floodplain tributary creek reaches, alluvial fan & alluvial plain tributary creek reaches, coastal sloughs, alluvial flood plain river reaches, and agricultural ditches.

¹¹ See: Water Research Foundation in collaboration with U.S. EPA, 2010. *Drinking Water Source Protection Through Effective Use of TMDL Process*.

waterbody's loading capacity among the various sources of that pollutant. Pollutant sources that can be characterized as point sources receive waste load allocations,¹³ nonpoint sources of pollution receive load allocations¹⁴. TMDLs also include a margin safety to account for uncertainty.

In these proposed TMDLs, owners and operators of irrigated lands, NPDES¹⁵–permitted municipal stormwater entities, NPDES–permitted industrial and construction stormwater entities, NPDES–permitted wastewater treatment facilities, owners/operators of livestock and domestic animals, and natural background sources are assigned un-ionized ammonia, nitrate, and orthophosphate allocations equal to the water quality numeric targets outlined previously in this agenda item.

The proposed TMDLs are concentration–based. This means the TMDLs are equal to the receiving water numeric water quality targets described in the water quality target section above. Concentration–based TMDLs are an appropriate expression of TMDLs and meet U.S. EPA requirements for TMDL approval.¹⁶ 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 waste load allocation and load allocation for these TMDLs is equal to the concentration-based nitrate, orthophosphate, and un-ionized ammonia water quality objective and numeric receiving water targets. However, consistent with U.S. EPA guidance, Central Coast Water Board staff also developed alternative mass load pollutant loading expressions. Mass-based, non-daily load expressions may provide a meaningful connection with on-the-ground implementation efforts where expressions other than receiving water concentrations may provide a basis for water quality-based management strategies.

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 Pajaro River basin. Therefore, management measures will need to be implemented to achieve the proposed load allocations for irrigated lands. At this time, Central Coast Water Board staff proposes that implementation

¹² The loading capacity is the greatest amount of a pollutant that a waterbody can assimilate and still meet water quality standards.

¹³ The portion of a receiving water's loading capacity that is allocated to NPDES-permitted point sources of pollution.

¹⁴ The portion of a receiving water's loading capacity attributed to nonpoint sources of pollution and natural background sources.

¹⁵ NPDES stands for [national pollutant discharge elimination system](#)

¹⁶ According to U.S. EPA 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 U.S. EPA, 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 U.S. EPA, TMDLs based on instantaneous concentration-based loads can satisfy the federal guidance to incorporate a daily time-step pollutant load.

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 deemed sufficient evidence that the TMDLs and load allocations for irrigated lands are being implemented. 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 Pajaro River basin aimed at addressing discharges of nutrients as described in the TMDL Report (attachment 2 to this staff report).

The goals of implementing these load allocations can be summarized as follows:

- 1) Control discharges of nitrate to impaired waterbodies and groundwater;¹⁷ and
- 2) Implement management practices capable of achieving load allocations identified in this TMDL and demonstrate progress towards this goal during the TMDL implementation phase.

NPDES–Permitted Municipal Stormwater System Discharges (MS4 entities)

Waste load allocations for this source category will be implemented by the State Water Resource Control Board's General Permit for the Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems (MS4s) General Permit ([Order No. 2013-0001-DWQ](#), NPDES No. CAS000004), or any subsequent permits. MS4s are considered relatively minor loads of nitrogen compounds and orthophosphate in the Pajaro River basin 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 waste load allocations. The Central Coast Water Board will address nitrogen compounds and orthophosphate discharged from the MS4 systems within the Pajaro River basin under the provisions of the NPDES General Permit, or any subsequent permits. MS4 entities in the Pajaro River basin include the cities of Watsonville, Gilroy, Morgan Hill, and Hollister, and the counties of Santa Cruz, Santa Clara, San Benito, and Monterey counties.

To address the MS4 waste load 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 Waste Load Allocation Attainment Program (WAAP). The WAAP 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. MS4 entities that discharge to surface waterbodies that are currently not impaired by nutrients and biostimulation are presumed to be meeting their waste load allocations at this time, and thus would not be required to develop a WAAP 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 degradation.¹⁸

¹⁷ Shallow, recently-recharged groundwater is identified in this TMDL as a significant source contributor of nitrate loads locally to stream waters of the Pajaro River basin.

¹⁸ Consistent with U.S. EPA 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. See the TMDL report (attachment 2 to the staff report) for further explanation and detail.

NPDES–Permitted Industrial and Construction Stormwater Discharges

Based on evidence and information provided in the TMDL report industrial facilities and construction sites in the Pajaro River basin permitted respectively by the NPDES statewide general permits for discharges associated with industrial activities and construction activities would not be expected to be a significant risk or cause of the observed nutrient water quality impairments. Thus these types of facilities are generally expected to be currently meeting proposed waste load allocations. Therefore, at this time, additional regulatory measures for this source category are not warranted.

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 permits) or the Construction General Permit ([Order No. 2012-0006-DWQ](#), NPDES No. CAS000002, or subsequent permits), respectively.

The information outlined in the TMDL report does not conclusively demonstrate that stormwater from all industrial facilities and construction sites are meeting proposed waste load 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.

NPDES–Permitted Wastewater Discharges

Based on available data, discharges of treated wastewater from municipal wastewater treatment facilities are expected to be a relatively minor source of nutrient pollution to surface waters of the Pajaro River basin. However, according to the U.S. Environmental Protection Agency and the State Water Resources Control Board, all NPDES-permitted point sources identified in TMDLs must be given a waste load allocation, even if their current load to receiving waters is zero.

The Watsonville Wastewater Treatment Facility ([Order No. R3-2014-0006](#), NPDES No. CA0048216) uses an ocean discharge point in Monterey Bay and these coastal marine waters are outside the scope of these TMDLs, therefore further regulatory measures in the context of these TMDLs for this facility is not warranted. This facility will be given a generic waste load allocation, to reserve discharge capacity if there is a need for future discharge points for this facility in surface waters of the Pajaro Valley. As noted above, all NPDES-permitted point sources identified in TMDLs must be given a waste load allocation, even if their current load to receiving waters is zero, otherwise their allocation is assumed to be zero and no discharges of the identified pollutant(s) are allowed now or in the future.

The South County Wastewater Treatment Facility ([Order No. R3-2010-0009](#), NPDES No. CA0049964) is permitted to discharge treated wastewater to the Pajaro River, but only under certain flow conditions. Based on available information, the existing effluent limitations and conditions in Order No. R3-2010-0009 would be expected to be capable of implementing and attaining the proposed waste load allocations identified in these TMDLs. Section 9.6 of the TMDL Report provides more detail on the nexus between waste load allocations identified in a TMDL, and implementing them through effluent limits in an NPDES permit. The available information does not conclusively demonstrate that the permitted treated wastewater discharge to the Pajaro River poses no threats to aquatic habitat, and thus during the TMDL implementation phase the Central Coast Water Board may use its Water Code section 13267 authorities to require the South County Regional Wastewater Authority to estimate their current or future nutrient loading contribution to the Pajaro River. The Central Coast Water Board subsequently may assess what, if any, modifications to the nutrient effluent limitations are needed to those currently specified in Order No. R3-2010-0009.

The City of San Juan Bautista Wastewater Treatment Facility ([Order No. R3-2009-0019](#), NPDES No. CA0047902) is permitted to discharge treated wastewater to an unnamed drainage ditch that is tributary to San Juan Creek. At this time, the hydraulic connectivity of this ditch with other creeks and drainages of the San Juan Valley is uncertain; however, elevated nutrient concentrations in the treated wastewater discharged to the ditch appear to be generally exceeding water quality numeric targets identified in these TMDLs. The Central Coast Water Board may use its Water Code section 13267 authorities to have the City of San Juan Bautista estimate their nutrient loading contribution and nutrient-related water quality impacts to downstream receiving waters. Based on this, and other information collected during TMDL implementation, the Central Coast Water Board will incorporate effluent and receiving water limitations for the surface water discharge at the San Juan Bautista Wastewater Treatment Facility.

Domestic Animal and Livestock Waste Discharges

Based on available information, it is generally expected that owners and operators of livestock and domestic animals on grazing lands or in rural residential areas are currently achieving proposed nutrient load allocations. As such, new regulatory measures and formal regulatory oversight are not warranted for this source category.

To maintain existing water quality and prevent any further water quality degradation, owners and operators of unconfined livestock on rangelands or confined livestock and domestic animals in rural residential areas which do not drain to a municipal separate stormwater sewer system should begin or continue to self-assess, self-monitor, and make animal management and manure management decisions which comport with accepted rangeland management practices or manure management practices recommended or published by reputable resource professionals or local agencies.

The Pajaro River basin is currently subject to a Domestic Animal Waste Discharge Prohibition and livestock owners are subject to compliance with an approved indicator bacteria TMDL load allocation.¹⁹ Implementation efforts by responsible parties to comply with this prohibition and with indicator bacteria load allocations will, as a practical matter, also reduce the risk of nitrogen and phosphorus loading to surface waters from domestic animal waste.

Information developed in the TMDL Report does not conclusively demonstrate that discharges from all livestock facilities are meeting proposed load 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 actions needed to reduce nutrient loading.

Public and Private Golf Courses

Use of fertilizer on golf courses could conceivably be a source of nutrients to surface waters in any given watershed. Available data from golf course creeks in the Pajaro River basin, as well as information on regional and national golf course water quality data suggest that golf courses would be expected to meet proposed load allocations that are protective of designated beneficial uses in streams of the Pajaro River basin, and thus formal regulatory actions or regulatory oversight of golf courses to implement these TMDLs is unwarranted at this time. Because anti-degradation is an element of all water quality standards, owners and operators of public and private golf courses should continue to implement turf management practices which

¹⁹ Central Coast Water Board Resolution No. R3-2009-0008 (March 2009).

help to protect and maintain existing water quality and to prevent any further surface water quality degradation.

Available information does not conclusively demonstrate that all golf courses in the Pajaro River basin are currently meeting proposed nutrient load allocations for discharges to surface waters. The Central Coast Water Board staff will obtain more information, where and if merited, during the implementation phase of the TMDLs to further assess the levels of nutrient contribution from this source category, and to identify any actions if necessary to reduce nutrient loading to surface waters.

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 approach.²⁰ The State of California and U.S. EPA have approved several TMDLs where the scientific basis was drawn 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.

The scientific portions of this TMDL project are drawn exclusively from the Total Maximum Daily Loads for Nitrogen Compounds and Orthophosphate in the lower Salinas River and Reclamation Canal Basin, and the Moro Cojo Slough Subwatershed, which has undergone the required external scientific peer review. As a result, the scientific portions of this TMDL project 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.

Milestones for Tracking Progress and Achieving the TMDLs

Discharges of nitrogen compounds and orthophosphate 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 TMDLs 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 load allocations and waste load allocations to establish progress towards implementation and achievement of the final waste load allocations and load allocations presented in the TMDL Report. These interim allocations can be summarized as follows:

- First Interim Waste Load and Load Allocations: Achieve the nitrate MUN nitrate standard (10 mg/L nitrate-N in receiving waters that are designated MUN) and the un-ionized ammonia water quality objective-based allocations within 10 years of the effective date of the TMDL (which is upon approval by the Office of Administrative Law).
- Second Interim Waste Load 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.

²⁰ State of California: Unified California Environmental Protection Agency Policy and Guiding Principles For External Scientific Peer Review, March 13, 1998.

- Final Interim Waste Load 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 and the Basin Plan objective for un-ionized ammonia is based primarily on the expectation that nearly all landowners and operators of irrigated agricultural activities will have completed Farm Water Quality Plans and be implementing management practices by the end of the five-year term of the Agricultural Order ([Order R3-2012-0011](#)) which was adopted on March 15, 2012. Water quality benefits resulting from implementing nutrient-control management measures (e.g., grass swales and riparian buffers, etc.) may take a few years to be realized. Ten years for the first interim waste load and load allocations is a reasonable timeframe to implement management measures and reduce nitrate levels consistent with the allocations and the numeric target. The basis for this estimate considers that there is evidence that widespread improvements to irrigation efficiency and water management in recent years have occurred in the Pajaro River basin. Furthermore, pilot projects in the central coast region have demonstrated that treatment with vegetated treatment systems can effectively and rapidly reduce nutrient pollution.²¹ Consequently, Central Coast Water Board staff anticipates that the first interim allocations are attainable by 2025. The 10-year benchmark is also consistent with the Central Coast Water Board's vision for the region of healthy, functioning watersheds by the year 2025.

The 15-year time frame to achieve the second interim waste load and load allocations (which are based on the wet-season nutrient biostimulatory targets) was identified as a reasonable time frame and intermediate benchmark prior to achieving the final, more-stringent final allocations. The basis for this timeline is that the full effect of source controls (nutrient and irrigation efficiency improvements) and surface runoff treatment systems (e.g., constructed wetlands, buffer strips) are anticipated to be manifested and reflected in water quality response within 15 years. Surface water quality and runoff response to the full effect of source control and runoff treatment should be expected more rapidly 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 longer time frames to respond to the full effects of source control measures.

The 25-year timeline to meet more-stringent dry-season biostimulatory substances allocations are based on Central Coast Water Board staff's estimates that legacy nutrient loads, which are unrelated to current practices and are originating from groundwater and baseflow, likely will locally continue to contribute elevated nutrients to Pajaro River basin surface waters for several decades. See the TMDL Report (attachment 2 to this staff report) for information on groundwater quality and estimated residence time of baseflow in the subsurface.

²¹ See information in the TMDL Report.

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}

POLICY ISSUE

Should the State Water Board approve the amendment to the Basin Plan to establish total maximum daily loads (TMDLs) for nitrogen compounds and orthophosphate in streams of the Pajaro River basin?

FISCAL IMPACT

Central Coast Water Board and State Water Board staff work associated with or resulting from this action will be addressed with existing and future budgeted resources.

REGIONAL BOARD IMPACT

Yes, approval of this resolution will amend the Water Quality Control Plan for the Central Coastal Basin (Basin Plan).

STAFF RECOMMENDATION

That the State Water Board:

1. Approve the amendment to the Basin Plan adopted under Central Coast Water Board Resolution No. R3-2015-0004.
2. Authorize the Executive Director or designee to submit the amendment adopted under Central Coast Water Board Resolution No. R3-2015-0004 as approved and the administrative record for this action to the Office of Administrative Law and the TMDL to the U.S. Environmental Protection Agency for approval.

State Water Board action on this item will assist the Water Boards in achieving Goal 1 of the [Strategic Plan](#) (2010 Update Report) to implement strategies to fully support the beneficial uses for all 2006-listed water bodies by 2030. In particular, approval of this item will assist in fulfilling Strategic Plan Objective 1.1 (Strategic Plan Update 2008-2012) to prepare, adopt, and implement TMDLs, designed to meet water quality standards, for all impaired water bodies on the 2006 list by 2019.

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 which are 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).

DRAFT

STATE WATER RESOURCES CONTROL BOARD RESOLUTION NO. 2016-

APPROVING AN AMENDMENT TO THE WATER QUALITY CONTROL PLAN FOR THE CENTRAL COASTAL BASIN (BASIN PLAN) TO ADOPT TOTAL MAXIMUM DAILY LOADS FOR NITROGEN COMPOUNDS AND ORTHOPHOSPHATE IN STREAMS OF THE PAJARO RIVER BASIN

WHEREAS:

1. On July 30, 2015, the Central Coast Regional Water Quality Control Board (Central Coast Water Board) adopted [Resolution No. R3-2015-0004](#) amending the Water Quality Control Plan for the Central Coastal Basin (Basin Plan) to establish total maximum daily loads (TMDLs) and an associated implementation plan for nitrogen compounds and orthophosphate in streams of the Pajaro River basin.
2. The Central Coast Water Board found the Basin Plan amendment was consistent with the provisions of the State Water Resources Control Board (State Water Board) [Resolution No. 68-16](#), "Statement of Policy with Respect to Maintaining High Quality of Waters in California" and 40 CFR section 131.12.
3. The elements of a TMDL are described in 40 CFR sections 130.2 and 130.7 and section 303(d) of the federal Clean Water Act and U.S. Environmental Protection Agency guidance documents. A TMDL is defined as "the sum of individual waste load allocations for point sources and load allocations for nonpoint sources and natural background" (40 CFR §130.2). The Central Coast Water Board has determined that the TMDLs for nitrogen compounds and orthophosphate in streams of the Pajaro River basin are set at levels necessary to attain and maintain the applicable water quality objectives taking into account seasonal variations and any lack of knowledge concerning the relationship between effluent limitations and water quality (40 CFR §130.7(c)(1)). The regulations in 40 CFR section 130.7 also state that TMDLs shall take into account critical conditions for stream flow, loading, and water quality parameters. TMDLs are often expressed as a mass load of the pollutant but can be expressed as a unit of concentration if appropriate (40 CFR §130.2(i)). Expressing the nitrogen compounds and orthophosphate TMDLs as units of concentration in this Basin Plan amendment is appropriate because attaining concentration-based water quality targets will result in the restoration and protection of relevant beneficial uses.
4. The Central Coast Water Board concurred with the analyses contained in the final TMDL Report, the California Environmental Quality Act (CEQA) "Substitute Environmental Documents" for the Basin Plan amendments (including the CEQA Checklist and Analysis), the staff report, and responses to comments, and found that these analyses comply with the requirements of the State Water Board's certified regulatory CEQA process, as set forth in California Code of Regulations, Title 23, section 3775 et seq. Furthermore, the Central Coast Water Board found that these analyses fulfill the Central Coast Water Board's obligations attendant with 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. The Central Coast Water Board's environmental analysis has taken into account a reasonable range of environmental, economic, and technical factors.

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5. The State Water Board finds that the Basin Plan amendment is in conformance with Water Code section 13240, which specifies that regional water quality control boards may revise water quality control plans; with section 13242, which requires a program of implementation to achieve water quality objectives; and with section 13243, which authorizes regional water quality control boards to specify certain conditions or areas where the discharges of certain types of waste will not be permitted. The State Water Board also finds that the TMDLs, as reflected in the Basin Plan amendment, are consistent with the requirements of CLEAN WATER ACT section 303(d).
6. The regulatory action meets the "Necessity" standard of the Administrative Procedures Act, Government Code, section 11353, subd. (b). The necessity of developing these TMDLs is established in the TMDL project report, the section 303(d) list, and the data contained in the administrative record documenting nutrient-related water quality impairments of the Pajaro River basin.
7. A Basin Plan amendment does not become effective until approved by the State Water Board and until the regulatory provisions are approved by the California Office of Administrative Law. The TMDLs must also receive approval from the U.S. Environmental Protection Agency.

THEREFORE BE IT RESOLVED THAT:

The State Water Resources Control Board:

1. Approves the amendment to the Basin Plan adopted under Central Coast Water Board Resolution No. R3-2015-0004.
2. Authorizes and directs the Executive Director or designee to submit the amendment adopted under Central Coast Water Board Resolution No. R3-2015-0004 and the administrative record for this action to the California Office of Administrative Law and the TMDLs to the U.S. Environmental Protection Agency for approval.

CERTIFICATION

The undersigned Clerk to the Board does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on April 5, 2016.

Jeanine Townsend
Clerk to the Board