

STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF DECEMBER 5–6, 2013

Prepared October, 2013

ITEM NUMBER: 15

SUBJECT: Adoption of a Total Maximum Daily Load for Boron in Streams of the Estrella River Basin

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THIS ACTION: Adopt Resolution No. R3-2013-0058

SUMMARY

In this agenda item, staff recommends the Central Coast Water Board approve the resolution (Attachment 1 to this Staff Report) that establishes a Total Maximum Daily Load (TMDL) for boron in streams of the Estrella River Basin and an associated implementation strategy to rectify the identified boron water quality impairments of surface waters. A concise tabular summary of the proposed TMDL and implementation strategy is presented in Appendix A, located on page 9 of this staff report.

Simply put, TMDLs are strategies or plans to address impaired waters identified on the federal Clean Water Act Section 303(d) list. The goals for establishing this TMDL are to 1) calculate the boron loading capacity of Estrella River Basin streams in accordance with Clean Water Act requirements; 2) recommend a strategy to limit the risk of anthropogenic boron loading to streams to the extent feasible¹ and provide for the attainment of water quality standards; and 3) identify and protect existing water quality conditions, consistent with state and federal anti-degradation requirements^{2,3}. Boron toxicity in water resources can have detrimental impacts to drinking water quality, irrigation supply and livestock watering, and to aquatic habitat and wildlife. Noteworthy is that two of the Central Coast Water Board's top priorities are correcting and *preventing* risks to human health and degradation of aquatic habitat. This includes the prevention of any further lowering of water quality in surface waters which currently support some, or all of their designated beneficial uses.

The Estrella River Basin drains a 950-square-mile, sparsely populated, rural area of eastern San Luis Obispo County and southeastern Monterey County. The Estrella River Basin includes the Estrella River, San Juan Creek, and Cholame Creek watersheds. A map of the Estrella River Basin is presented in Figure 1 on page 8 of this staff report. The Estrella River and Cholame Creek

¹ Staff estimates that natural, non-controllable source contributions of boron to surface waters may render current boron water quality objectives locally unattainable even with anthropogenic source controls in place. Therefore, pending the acquisition of additional data, it may be necessary to develop site-specific boron water quality objectives that account for natural background and provide for the attainment of water quality standards, thereby rectifying the 303(d)-listed impairment.

² State and federal anti-degradation policies require that where existing water quality is *better* than the quality of water established as objectives, such existing water quality shall be maintained. In the Estrella River, boron water quality is *better* than necessary to support designated aquatic habitat, wildlife, and livestock watering beneficial uses. Consequently, future degradation of existing boron water quality is not allowed unless consistent with provisions of state and federal anti-degradation policies.

³ One of the Central Coast Water Board's top priorities is *preventing* any further degradation of existing high quality aquatic habitat (see Staff Report, Agenda Item 3 for Regular Meeting of July 11, 2012). For purposes of anti-degradation policy "high quality waters" are defined on a constituent-by-constituent basis.

were listed on the 2010 Clean Water Act Section 303(d) list on the basis of not meeting boron water quality objectives for agricultural water use.

This proposed TMDL for boron and the associated implementation strategy will ultimately result in rectifying the identified Clean Water Act Section 303(d)-listed boron impairments in the Estrella River Basin. Central Coast Water Board staff has identified sources of boron that are causing water quality impairments and has identified the actions necessary to provide for the attainment of relevant water quality standards.

Staff has identified the *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands in the Central Coast Region* (Agricultural Order) as an appropriate existing regulatory mechanism to limit the risk of anthropogenic boron loading to surface waters of the Estrella River Basin. *Additional or new regulatory measures to implement the TMDL are unwarranted and are not being proposed to achieve the TMDL.*

TMDLs are often adopted through basin plan amendments when the solution to impairment would require multiple actions of regional water boards; for example, actions that affect multiple regulatory measures or regulatory permits. For this TMDL, adoption through a basin plan amendment is not necessary. Staff recommends Central Coast Water Board's approval of the resolution associated with this agenda item. State policy considers this type of approach, when warranted, to be a matter of efficiency and resource allocation as it reduces regulatory and administrative redundancy⁴.

The technical basis for the TMDL and associated implementation strategy are provided in the Final Technical Project Report (Attachment 2 to this staff report). The Final Technical Project Report is also provided online at the Central Coast Water Board's website:

http://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/estrella_riv_boron/index.shtml

DISCUSSION

Project Development for TMDL

Staff developed the TMDL using water quality data from the Central Coast Water Board's Central Coast Ambient Monitoring Program (CCAMP). Staff also used land use data, hydrologic data, geologic data, and groundwater data from the U.S. Geological Survey, the National Hydrography Dataset, the U.S. Natural Resources Conservation Service, the California Department of Conservation, as well as from other agency and scientific sources.

Numeric Targets

Numeric targets are water quality thresholds developed and used to ascertain when and where water quality objectives are achieved, and hence, when beneficial uses are protected.

Boron Target for Protection of MUN and GWR beneficial uses:

The purpose of this target is to implement the Central Coast Basin Plan's narrative toxicity general water quality objective and to ensure support of designated drinking water supply beneficial uses in the Estrella River Basin. The California Department of Public Health has established a recommended public health-based notification level for boron in drinking water of 1 mg/L. Therefore, the numeric target for boron, which demonstrates whether or not the MUN (drinking water supply) and GWR (groundwater recharge) designated beneficial uses are being supported, is as follows:

⁴ *Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options*. State Water Resources Control Board, adopted by Resolution 2005-0050.

- *The controllable discharge of wastes shall not cause concentrations of boron to exceed 1 mg/L in receiving waters.*

Boron Target for Protection of WARM, SPWN, WILD, and RARE beneficial uses:

The purpose of this target is to implement the Central Coast Basin Plan's narrative toxicity general water quality objective and to ensure support of designated aquatic habitat and wildlife beneficial uses in streams of the Estrella River Basin. Based on information provided in the Final Project Report (attachment 2 of the staff report), scientific literature reporting and several regulatory entities have identified a numeric threshold of 5 mg/L boron as being reasonably protective of wildlife and aquatic habitat. Therefore, the numeric target for boron, which demonstrates whether or not the WARM, SPWN, WILD, and RARE designated beneficial uses are being supported, is as follows:

- *The controllable discharge of wastes shall not cause concentrations of boron to exceed 5 mg/L in receiving waters.*

According to available water quality data, boron concentrations in the Estrella River are easily achieving this numeric target under all flow and seasonal conditions and therefore aquatic habitat and wildlife designated beneficial uses of the river are being supported on the basis of boron water quality. It should be noted that state and federal anti-degradation policies require that existing boron water quality that is better than necessary to support aquatic habitat be maintained, and that future degradation of existing water quality is not allowed unless consistent with provisions of the state and federal anti-degradation policies⁵.

Boron Targets for Protection of AGR beneficial uses:

The purpose of this target is to implement the Central Coast Basin Plan's water quality objective for irrigation water supply. The Central Coast Basin Plan contains two water quality objectives for boron protective of agricultural supply uses: 0.75 mg/L boron for irrigation supply and 5 mg/L for livestock watering. The boron water quality objective for irrigation supply is more stringent than the boron water quality objective for livestock watering; therefore, the irrigation supply criterion is fully protective for all AGR beneficial uses. Therefore, the proposed TMDL numeric target boron demonstrating whether the AGR designated beneficial uses for agricultural water supply are being supported is as follows:

- *The controllable discharge of wastes shall not cause concentrations of boron to exceed 0.75 mg/L in receiving waters.*

Using the numeric water quality criteria outlined above and those presented within the TMDL project report (attachment 2 of the Staff Report), Table 1 presents a tabular summary of numeric water quality criteria and associated identified water body impairments within the river basin.

⁵ State Water Resources Control Board and appellate court decisions indicate that water can be considered high quality for purposes of the anti-degradation policy on a constituent-by-constituent basis. Therefore, water can be of high quality under the anti-degradation policy for some constituents or beneficial uses, but not for others (see *Court of Appeal of the State of California, Third Appellate District, Appeal Case C066410, Acociacion de Gente Unida, etc. et al. v. Central Valley Regional Water Quality Control Board*).

Table 1. Status summary of designated beneficial uses of Estrella River Basin streams that could potentially be impacted by boron.

Stream	Designated Beneficial Use	Boron Water Quality Objective, or Recommended Numeric Level	Exceeding Water Quality Criteria or Non-regulatory Recommended Level?	Is Beneficial Use Being Supported?	Reach Impaired
Estrella River (currently on CWA 303d List)	MUN & GWR (drinking water supply & groundwater recharge)	<i>Basin Plan Toxicity Narrative Objective</i> 1.0 mg/L	Yes	No	Estrella River all reaches
	AGR (irrigation supply)	0.75 mg/L	Yes	No	Estrella River all reaches
	AGR (livestock watering)	5 mg/L	No	Yes	none
	WARM, SPWN,WILD, RARE (aquatic habitat)	<i>Basin Plan Toxicity Narrative Objective</i> 5 mg/L	No	Yes	none
Cholame Creek (currently on CWA 303d List)	MUN & GWR (drinking water supply & groundwater recharge)	<i>Basin Plan Toxicity Narrative Objective</i> 1.0 mg/L	Yes	No	Cholame Creek all reaches
	AGR (irrigation supply)	0.75 mg/L	Yes	No	Cholame Creek all reaches
	AGR (livestock watering)	5 mg/L	Yes	No	Cholame Creek upstream of Bitterwater Rd.
	WARM, ,WILD, RARE (aquatic habitat)	<i>Basin Plan Toxicity Narrative Objective</i> 5 mg/L	Yes	No	Cholame Creek upstream of Bitterwater Rd.
Upper San Juan Creek (upstream of Hwy. 58) (NOT on current CWA 303d List)	MUN & GWR (drinking water supply & groundwater recharge)	<i>Basin Plan Toxicity Narrative Objective</i> 1.0 mg/L	No	Yes ^A <i>For Upper San Juan Creek upstream of Hwy. 58; no boron data for lower San Juan Creek</i>	None identified on the basis of limited available data
	AGR (irrigation supply)	0.75 mg/L	No	Yes ^A <i>For Upper San Juan Creek upstream of Hwy. 58; no boron data for lower San Juan Creek</i>	None identified on the basis of limited available data
	AGR (livestock watering)	5 mg/L	No	Yes ^A <i>For Upper San Juan Creek upstream of Hwy. 58; no boron data for lower San Juan Creek</i>	None identified on the basis of limited available data
	WARM, ,WILD, RARE (aquatic habitat)	<i>Basin Plan Toxicity Narrative Objective</i> 5 mg/L	No	Yes ^A <i>For Upper San Juan Creek upstream of Hwy. 58; no boron data for lower San Juan Creek</i>	None identified on the basis of limited available data

^A This determination was made on the basis of one water quality sample collected from San Juan Creek at Highway 58. It should be noted that the California 303(d) Listing Policy specifies that there be a minimum of five samples with exceedances of water quality criteria before a waterbody can be listed on the CWA 303(d) list. . At this time, staff finds that San Juan Creek upstream of Highway 58 is meeting all boron water quality criteria on the basis of one water quality sample.

Source Analysis

Multiple lines of evidence are developed in this TMDL project that demonstrate non-controllable natural sources contribute to or cause elevated levels of boron in streams of the Estrella River Basin. The only controllable source that could plausibly contribute to elevated boron in waterbodies is irrigated agricultural operations. Based on the weight of evidence, and in staff's judgment, natural non-controllable sources are the major source of boron to surface receiving waterbodies. Application of irrigation water and fertilizers could plausibly be a minor contributor of boron to waterbodies. However, current regulation of agriculture operations and ongoing implementation practices required by existing regulation are anticipated to minimize the risk of controllable boron loading and mitigate anthropogenic boron loading to streams to the extent feasible.

TMDL and Allocations

TMDL:

The TMDL represents the loading capacity of a waterbody—the amount of a pollutant that the waterbody can assimilate and still support beneficial uses. The TMDL is the sum of allocations for nonpoint and point sources and any allocations for a margin of safety.

The TMDL for boron in streams of the Estrella River Basin are as follows:

The controllable discharge of wastes shall not cause concentrations of boron to exceed 0.75mg/L in receiving waters.

Allocations:

Waste load allocations are pollutant allocations to point sources. There are no point sources in the Estrella River Basin so the waste load allocation component of the TMDL is set at zero. Load allocations are pollutant allocations to non-point sources. The identified sources of boron in streams of the Estrella River Basin are natural background sources (major source) and irrigated agriculture (minor source). Therefore load allocations are assigned to these two sources. Table 2 presents tabular summaries of the boron TMDL allocations.

Table 2. Boron TMDL allocations.

BORON WASTE LOAD ALLOCATIONS^A			
<u>Waterbody</u>	<u>WBID</u>	<u>Party Responsible (Source)</u>	<u>Receiving Water Allocation for Boron</u>
Estrella River Cholame Creek and their tributaries	Estrella River CAR3170007119990225125807 Cholame Creek CAR3170008120011127080727	NONE	0
BORON LOAD ALLOCATIONS^A			
<u>Waterbody</u>	<u>WBID</u>	<u>Responsible Party (Source)</u>	<u>Receiving Water Allocation for Boron</u>
Estrella River Cholame Creek and their tributaries	Estrella River CAR3170007119990225125807 Cholame Creek CAR3170008120011127080727	Natural Sources (no responsible parties - not subject to regulation)	0.75 mg/L
Estrella River Cholame Creek and their tributaries	Estrella River CAR3170007119990225125807 Cholame Creek CAR3170008120011127080727	Owners/operators of irrigated cropland (fertilizer application and irrigation water)	0.75 mg/L

^A federal and state anti-degradation requirements apply to all waste load and load allocations.

Implementation Strategy: Proposed Actions to Correct the 303(d)-Listed Impairments

Irrigated agriculture is estimated to be a potential minor source of boron loads to surface waters in the Estrella River Basin. To continue to protect existing water quality and minimize the risk of further degradation of boron water quality, it is necessary to control and manage the risk of anthropogenic sources of boron loading from irrigated cropland. Achievement of load allocations for this source category will be demonstrated by owners' and operators' of irrigated lands implementing and complying with the Conditional Waiver of Waste Discharge Requirements for Irrigated Lands (Order R3-2012-0011) and the Monitoring and Reporting Programs in accordance with Orders R3-2012-0011-01, R3-2012-0011-02, and R3-2012-0011-03, or its renewals or replacements. The Agricultural Order requires that discharges comply with applicable water quality standards and with applicable provisions of the Water Quality Control Plan for the Central Coastal Basin (Basin Plan). The Agricultural Order requires that dischargers must develop and implement a farm water quality management plan or update the farm plan as necessary to achieve compliance with the agricultural order. Farm plans should incorporate measures designed to achieve the boron load allocations identified in this TDML and to prevent any further degradation of boron surface water quality, consistent with anti-degradation requirements promulgated in the Basin Plan. Staff has concluded that the current Agricultural Order provides the requirements necessary to implement and achieve load allocations for irrigated lands in this TMDL. **Staff concludes at this time that no further regulatory measures are deemed necessary to achieve the load allocations for irrigated lands.**

In the Estrella River and Cholame Creek, natural conditions are a major source of boron loading to streams and **may render the identified boron water quality objectives and loading capacity of the waterbodies unattainable on the basis of non-controllable, local natural conditions which likely exceed the load allocation for natural sources.** Pending the acquisition of additional water quality data in the future, staff may recommend a modification of the boron numeric water quality objectives applicable to the Estrella River and Cholame Creek. This may include development of site specific objectives (SSOs), thus rectifying the 303(d)-listed impairments.

Staff has developed this TMDL, in part, to be consistent with state and federal anti-degradation policy. In the Estrella River, designated aquatic habitat (WARM, SPWN, WILD), and livestock watering (AGR) beneficial uses are easily being supported on the basis of boron data. Consequently, future degradation of existing boron water quality in the Estrella River is not allowed unless consistent with provisions of the state and federal anti-degradation policies. Non-compliance with anti-degradation requirements may be determined on the basis of trends in declining water quality consistent with the methodologies provided in Section 3.10 of the California 303(d) Listing Policy⁶.

Time Schedule

There is currently insufficient data to refute the potential of anthropogenic contributions of boron to streams of the Estrella River Basin; likewise there is currently insufficient data to develop site-specific boron water quality criteria on the basis of natural loading to streams. Staff anticipates that two more CCAMP monitoring cycles in the Estrella River Basin, in conjunction with evaluation of information collected pursuant to the Agricultural Order, will be necessary prior to making a determination to develop site-specific boron water quality criteria. Based on current CCAMP monitoring schedules, this amounts to a minimum of 12 years from the date of Water Board adoption of this TMDL. Amending boron numeric water quality criteria applicable to streams of the

⁶ *Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List.* State Water Resources Control Board, adopted by Resolution No. 2004-0063.

Estrella River Basin will require development of a Basin Plan amendment, with Central Coast Water Board, State Board, and USEPA approvals, and considerable expenditure of staff resources. There are no permits with effluent limitations for boron regulating discharges in the Estrella River Basin, and existing boron water quality is not negatively impacting current beneficial uses of surface waters in the watershed. Therefore, there is no immediate urgency to develop site-specific objectives for boron for the Estrella River Basin. Staff does, however, recommend a future Basin Plan amendment to address the issue, if merited by future data collection. Staff will prioritize this future effort against competing threats to water quality. Staff anticipates that the 303(d) listed water quality impairment – including the potential development of site-specific water quality criteria for boron – could be resolved by the year 2026. In the interim, as consistent with the Central Coast Water Board's identified priorities, it is prudent to ensure that controllable sources of boron are managed to prevent risks to human health and to aquatic habitat and to ensure that further degradation of water quality does not occur.

ANTI-DEGRADATION

This TMDL is consistent with the provisions of State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California" and 40 CFR 131.12. The adoption of the proposed TMDL and TMDL implementation strategy 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; therefore, state and federal anti-degradation analyses are not required.

PUBLIC INVOLVEMENT

Staff conducted stakeholder outreach efforts during TMDL development. Staff conducted a public workshop in San Luis Obispo on August 26, 2013, and staff engaged with stakeholders during the development of the TMDL through informal contacts such as email. Individuals and entities staff engaged during the public workshop or contacted during TMDL development included individuals and representatives of the following:

- Owners and operators of irrigated cropland in the Estrella River Basin
- Agricultural consultants
- County of San Luis Obispo Department of Public Works
- Upper Salinas-Las Tablas Resource Conservation District
- San Luis Obispo County Farm Bureau
- California Department of Fish and Wildlife
- City of Paso Robles Department of Public Works
- PRO Water Equity, Inc.
- North County Watch
- University of California Cooperative Extension
- Central Coast Salmon Enhancement

The staff report, resolution, and technical project reports were made available for a 30-day public comment commencing on September 19, 2013. Water Board staff solicited public comment from a range of stakeholders including local land owners and land operators, agricultural representatives, environmental representatives, resource professionals, and public agencies.

One public comment letter was received from:

1. Ms. Janet Parrish, TMDL Liaison, U.S. Environmental Protection Agency (USEPA), Region IX, San Francisco, in a letter dated October 21, 2013. Ms. Parrish states that USEPA supports and recommends adoption of this TMDL by the Central Coast Water Board.

RECOMMENDATION

Adopt Resolution No. R3-2013-0058.

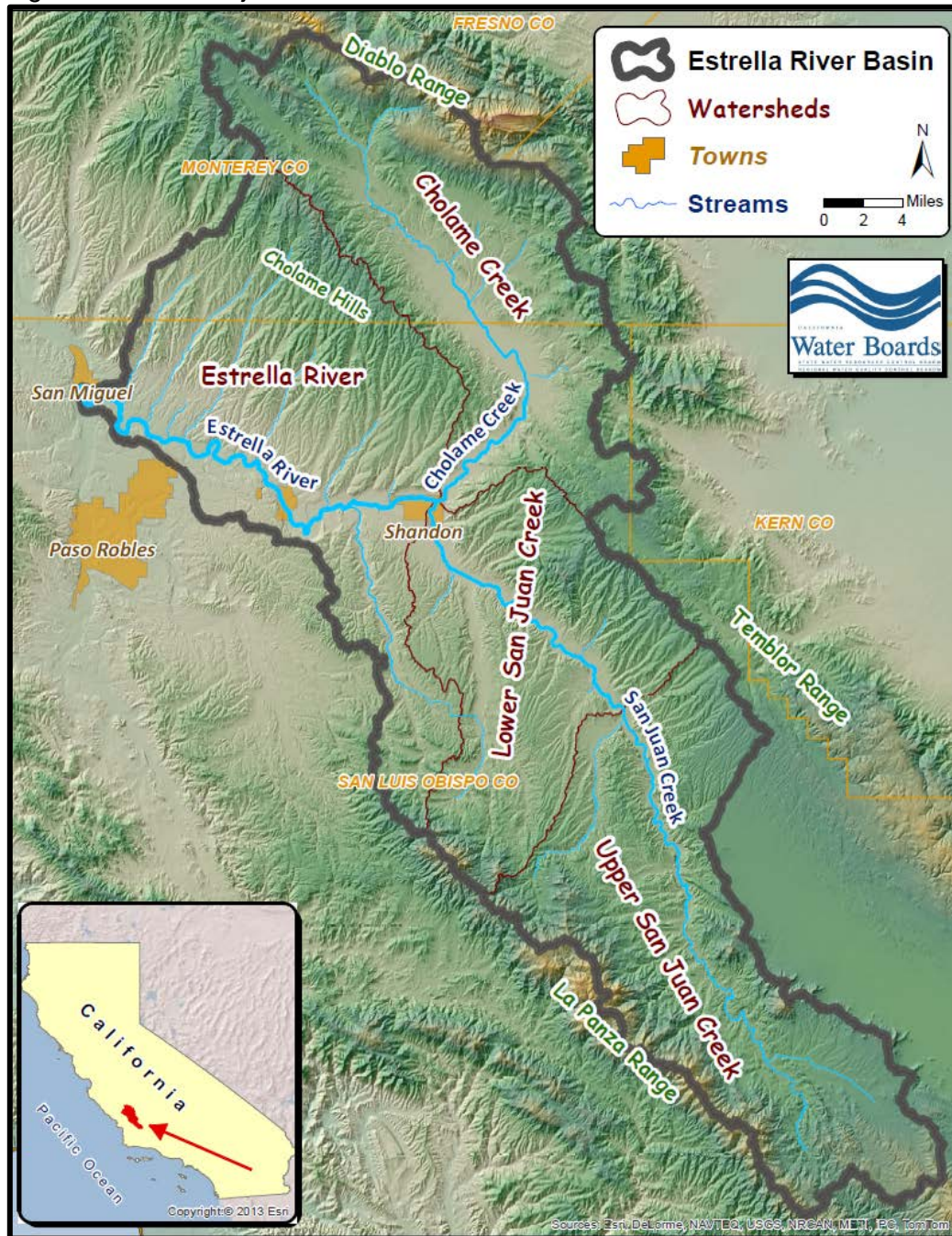
ATTACHMENTS:

The attachments are available at:

http://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/estrella_riv_boron/index.shtml

1. Resolution No. R3-2013-0058
2. Final Project Report: "Total Maximum Daily Loads Technical Report and Recommendations for Development of Site Specific Water Quality Criteria for Boron in Streams of the Estrella River Basin"
3. Notice of Opportunity for Public Comment

Figure 1. TMDL Project Area – Estrella River Basin.



Appendix A – Concise tabular summary of the proposed boron total maximum daily load (TMDL) for streams of the Estrella River Basin

ESTRELLA RIVER BASIN TMDL FOR BORON – CONCISE SUMMARY California Regional Water Quality Control Board, Central Coast Region	
Waterbody Identification	Estrella River, Cholame Creek and their tributaries from confluence with Salinas River upstream to the headwaters. <i>303(d)-Listed Boron Impaired Waters:</i> <ul style="list-style-type: none"> • Estrella River WBID: CAR3170007119990225125807 • Cholame Creek WBID: CAR3170008120011127080727
Location	San Luis Obispo County, California Hydrologic Unit Code # 18060004 (Estrella River Basin)
TMDL Pollutant of Concern	Boron
Pollutant Sources	Natural background (major source) Irrigated agriculture (minor source)
Beneficial Uses Currently Supported <i>(on the basis of boron numeric water quality guidelines)</i>	<u>Estrella River:</u> Protected for aquatic habitat and wildlife protection (WARM, SPWN, WILD, RARE) Protected for livestock watering (AGR).
Beneficial Uses Impaired <i>(on the basis of boron numeric water quality objectives and guidelines)</i>	<u>Estrella River:</u> Impaired for use as irrigation supply (AGR) Impaired for drinking water supply (MUN)
	<u>Cholame Creek</u> Impaired for use as irrigation supply and stock watering (AGR) Impaired for drinking water supply (MUN) Impaired for protection of aquatic habitat and protection and wildlife (WARM, WILD, RARE)
Numeric Target	0.75 mg/L boron
Loading Capacity (TMDL)	Boron not to exceed 0.75 mg/L in receiving waters.
Implementation Strategy: Proposed Actions to Correct 303(d)-Listed Impairments	<i>Owners/operators of irrigated lands:</i> implement and comply with the Central Coast Water Board's Agricultural Order to minimize risk of boron loading from fertilizers and irrigation water. <i>Central Coast Water Board staff:</i> develop and implement revised water quality guidelines in the future if appropriate, based on additional data collection. This may include site-specific water quality objectives for boron based on the assessment that existing boron water quality criteria may be unachievable due to natural inputs.