1. Introduction

This staff report presents the necessary information and findings to support the draft Water Quality Objectives (WQO) Update Amendment. The draft WQO Update Amendment was developed by North Coast Regional Water Quality Control Board (Regional Water Board) staff to update the Basin Plan by revising the Water Quality Objectives (Section 3) and Implementation Plans (Section 4) of the Basin Plan. The primary goals of the draft WQO Update Amendment are to:

- develop a narrative groundwater toxicity objective
- update the chemical constituents objectives for surface waters and groundwaters
- update the dissolved oxygen (DO) objectives, and
- clarify the process the Regional Water Board uses when narrative objectives are translated into numeric limits for use in permits, orders, or other regulatory actions.

The draft WQO Update Amendment language is appended to this staff report. Appendices A and B provide a strikethrough/underline version of the draft revisions to the Water Quality Objectives and Implementation Plans sections of the Basin Plan (Sections 3 and 4, respectively). Appendices C and D present the "clean version" of Sections 3 and 4 of the Basin Plan with the draft revisions incorporated. This staff report provides the information relative to the scope, need, and environmental impacts of the draft WQO Update Amendment necessary to support the Regional Water Board's consideration and adoption of the draft amendment.

1.1 Function and Framework of the Basin Plan

The Porter-Cologne Water Quality Control Act (Porter-Cologne) established the regional water board system and charged the boards with the primary responsibility for protecting water quality in the state.[1] Porter-Cologne also required that each regional water board formulate and adopt basin plans for all areas within its region. The Regional Water Board's Basin Plan is designed to provide a definitive program of actions to preserve and enhance water quality and protect beneficial uses of waters of the state in the Region and forms the basis for the Regional Water Board's regulatory programs. The Basin Plan also must be consistent with state policies and plans. The Basin Plan, including periodic updates, is approved by the State Water Resources Control Board (State Water Board), the Office of Administrative Law (OAL), and the United States Environmental Protection Agency (U.S. EPA), as appropriate.[2] Specifically, the Basin Plan:

1) Identifies beneficial uses for surface waters and groundwaters;
2) Sets narrative and numeric ambient water quality objectives that must be attained or maintained to protect beneficial uses;
3) Describes implementation programs that include specific prohibitions, action plans, and policies to achieve ambient water quality objectives; and
4) Describes surveillance and monitoring activities.

[1] Wat. Code § 13001.
[2] U.S. EPA approval is required for surface water standard actions.

Section 2 of the Basin Plan (Beneficial Uses) identifies the existing and potential beneficial uses of water in the North Coast Region, including uses that pertain to: human health (e.g., drinking water, recreation), commerce (e.g., industrial process water, hydropower), aquatic life (e.g., cold water habitat, spawning habitat), and ecological services (e.g., flood peak attenuation, water quality enhancement). Existing beneficial uses are those uses that were attained in a waterbody on or after November 28, 1975, for surface water protected under the Clean Water Act[3] and on or after October 24, 1968[4] for all other waters protected under Porter-Cologne. Potential beneficial uses are established for any of the following reasons:

1) The use existed prior to November 28, 1975 (or prior to October 24, 1968), but is not currently being attained;
2) Plans already exist to put the water to that use;
3) Conditions make such future use likely;
4) The water has been identified as a potential source of drinking water based on the quality and quantity available (see *State Water Board Resolution No. 88-63, Sources of Drinking Water Policy* described in Chapter 2 of this staff report);
5) Existing water quality does not support these uses, but remedial measures[5] may lead to attainment in the future; or
6) There is insufficient information to support the use as existing; however, the potential for the use exists and upon future review, the potential use may be re-designated as existing.

One of the functions of the Basin Plan is to designate beneficial uses for individual waterbodies or categories of waters. Regional water boards are required to protect beneficial uses of water[6] if they exist in a waterbody, even if they are not currently listed in Table 2-1 in the Basin Plan.[7] Table 2-1 of the Basin Plan identifies the designated beneficial uses of individually named hydrologic areas, as well as categories of waters. The beneficial uses of the North Coast Region include:

MUN	Municipal and Domestic Supply
AGR	Agricultural Supply
IND	Industrial Service Supply
PRO	Industrial Process Supply
GWR	Groundwater Recharge
FRSH	Freshwater Replenishment
NAV	Navigation
POW	Hydropower Generation
REC-1	Water Contact Recreation

[3] Date of the first Water Quality Standards Regulation published by U.S. EPA (November 28, 1975) 40 CFR 131.3 (e).
[4] *Asociación de Gente Unida por el Agua v. Central Valley Regional Water Quality Control Board* (2012) 210 Cal.App.4th 1255 (*AGUA)*decision concludes that the antidegradation baseline is 1968 of the best water quality that has existed since 1968
[5] Remedial measures include implementation of effluent limits required under Section 301(b) and 306 of the CWA, and implementation of cost-effective and reasonable best management practices for nonpoint source control. 40 CFR 131.10(d).
[6] Wat. Code § 13241.
[7] 40 CFR 131.3 .

REC-2	Non-Contact Water Recreation
COMM	Commerical and Sport Fishing
WARM	Warm Freshwater Habitat
COLD	Cold Freshwater Habitat
ASBS	Preservation of Areas of Special Biological Significance
SAL	Inland Saline Water Habitat
WILD	Wildlife Habitat
RARE	Rare, Threatened, or Endangered Species
MAR	Marine Habitat
MIGR	Migration of Aquatic Organisms
SPWN	Spawning, Reproduction, and/or Early Development of Fish
SHELL	Shellfish Harvesting
EST	Estuarine Habitat
AQUA	Aquaculture
CUL	Native American Culture
FLD	Flood Peak Attenuation/Flood Water Storage
WET	Wetland Habitat
WQE	Water Quality Enhancement
FISH	Subsistence Fishing

Most of the beneficial uses described are applicable to surface waters in the North Coast Region. Beneficial uses for surface waters are generally designated for individually named hydrologic units. Groundwaters, on the other hand, are identified as a single category of waters and designated for MUN, AGR, IND, PRO, AQUA, and CUL beneficial uses. Where groundwater and surface water are connected, the designated beneficial uses of the surface water may also apply to groundwater.

Section 3 of the Basin Plan (Water Quality Objectives) identifies ambient water quality objectives that the Regional Water Board has adopted for the protection of beneficial uses of water. These objectives describe the characteristics of waterbodies necessary to allow the beneficial use of those waterbodies and form the basis for establishing numeric effluent (or discharge) limits or cleanup levels in Regional Water Board permits, orders, or other regulatory actions. Further, anyone discharging or threatening to discharge a waste to a water of the state must comply with the provisions of the Basin Plan, in most cases seeking specific authorization from the Regional Water Board for the right to discharge. Where those discharges have the potential to impact ambient conditions, water quality objectives will apply.

Any regulatory agency, whether local, state or federal, with authority over an activity that could affect water quality, has an obligation to consider the Basin Plan and its water quality objectives during its decision-making process. This is the case for a wide range of potential projects including: building projects, road construction, logging, water withdrawal, groundwater injection, etc. All controllable water quality factors must conform to the water quality objectives contained in the Basin Plan. For further discussion see Section 2.2 Existing Regulatory Framework.

For the purposes of this draft proposed amendment, the groundwater and surface water beneficial uses identified in the Basin Plan adequately represent past, present, and probable future beneficial uses. The draft proposed groundwater toxicity objective, the revised chemical constituents objectives for surface waters and groundwaters, and the revised dissolved oxygen objectives for surface waters are designed to protect these beneficial uses. The draft proposed amendment also includes significant introductory language that describes the means by which applicable numeric values are determined that implement narrative water quality objectives in a manner sufficient to protect the most sensitive beneficial uses of a given waterbody. As such, the draft proposed objectives are fully protective of surface water and groundwater beneficial uses and reflect existing practices when implementing water quality objectives through permits, orders or other regulatory actions.

1.2 Triennial Review List of Basin Planning Priorities

Section 13240 of the Porter-Cologne Water Quality Control Act and Section 303 (c)(1) of the federal Clean Water Act require a review of basin plans at least once each three-year period to keep pace with changes in regulation, new technologies, policies, and physical changes within the region.

The Regional Water Board is responsible for reviewing the Basin Plan, and is required to: 1) identify those portions of the Basin Plan that are in need of modification or new additions; 2) adopt standards as appropriate; and 3) recognize those portions of the Basin Plan that are appropriate as written. The Regional Water Board solicits written and oral public input, which it considers prior to adopting a prioritized list of basin planning projects. The highest priority projects are included on the "short list" which establishes the workplan of the Regional Water Board's Planning Unit for the next three-year period.

A triennial review of the Basin Plan was last conducted in 2011 resulting in the Regional Water Board's adoption of Resolution No. R1-2011-0091, including as an attachment to the *Proposed 2011 Triennial Review List of Potential Basin Plan Amendments.*[8] The WQO Update Amendment is included as part of Item #3 and #4 on the 2011 Triennial Review. In total, the projects included on the short list in the 2011 triennial review are:

1. TMDL-related projects in the Elk River, Freshwater Creek, Eel River, Mattole River, Navarro River, Russian River, and the Laguna de Santa Rosa;
2. A Temperature Implementation Policy;
3. Water quality objectives for groundwater and surface water, including new and revised programs of implementation;
4. Dissolved oxygen water quality objectives for free flowing streams, wetlands, and lakes; and,
5. An Aquatic Ecosystem Restoration Policy.

[8] http://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/111013_tr/100929_res_11-0091_trirev.pdf

1.2.1 Planning History of Chemical Constituents and Groundwater Toxicity Objectives

For a number of years, the Regional Water Board has ranked the development of a groundwater toxicity objective as a high priority during each triennial review process. During the 2004 Triennial Review of the Basin Plan, the Regional Water Board included direction that a Basin Plan amendment be developed that would clearly articulate the process used by the Board in translating narrative water quality objectives into numeric limits for use in permits, orders, or other regulatory actions as appropriate. The Regional Water Board also directed staff to develop minor editorial (non-substantive) revisions to the existing water quality objectives for groundwater and surface water to update outdated references, etc.

As part of the 2007 Triennial Review, these issues were combined into one task to facilitate development of a comprehensive proposal and to aid in outreach and solicitation of public comment. Staff determined that the multitude of actions required to complete this task would be most appropriately divided into two distinct Basin Plan amendments. The actions identified in this staff report represent the first phase of this work. This first phase focuses on revisions to water quality objectives and the addition of new language that clarifies how narrative objectives are translated into numeric limits. The second phase will focus on revisions to Basin Plan Section 4 (Implementation Plans) to include statewide groundwater protection policies (e.g., the State's Recycled Water Policy) and update the implementation program for the discharge of waste to land (e.g., Groundwater Protection Strategy amendment).

The 2011 Triennial Review List, adopted on September 29, 2011, identifies the two phases of this work as task three of thirty-one tasks. Following the Regional Water Board's consideration of the WQO Update Amendment, staff will begin development of the Groundwater Protection Strategy amendment.

The Regional Water Board held a workshop at its regularly scheduled Board meeting on March 15, 2012 on the draft WQO Update Amendment. Oral and written public comments on the draft amendment were also solicited. Commenters raised a number of issues which staff addressed in a revised draft amendment package released for public review on February 21, 2013 in preparation for the adoption hearing scheduled before the Regional Water Board for June 13, 2013. Significant public comments were received during this public comment period which necessitated a postponement of the scheduled adoption hearing and additional refinement of the draft amendment package. This draft Substitute Environmental Document (SED) consists of this Staff Report and response to comments documents to address public comments received to date, most specifically expanding the California Environmental Quality Act (CEQA) analysis to address potentially significant environmental impacts resulting from implementation of the proposed amendment.

1.2.2 Planning History of Dissolved Oxygen Objectives

The Regional Water Board directed staff in its 2007 Triennial Review of the Basin Plan to develop a proposal for the revision of the water quality objectives for dissolved oxygen (DO) as contained in the Basin Plan. Two CEQA scoping meetings were held in the fall of 2008, one in Santa Rosa and one in Weaverville. A Scoping Document was presented and public comments solicited. The proposed revision of the existing DO objectives was intended to apply throughout the North Coast Region.

In the spring of 2009, a draft staff report was written, based in part on scoping comments received. It was submitted to two peer reviewers for their scientific review and comment. The Regional Water Board received peer review comments later in the spring of 2009 and began revision of the document for public review.

In the meantime, the schedule for the Klamath River Total Maximum Daily Load (TMDL) for DO (and other parameters) required the immediate review of the Site Specific Objectives (SSOs) for DO in the Klamath mainstem. Staff turned its attention to the Klamath SSOs for DO, determined the need for revision and issued a proposal to amend them for public review during the summer of 2009. The proposal for the revision of the Klamath SSOs for DO adheres to the recommendations as provided by the peer reviewers of the regionwide proposal. The SSOs for DO in the Klamath River was adopted by the Regional Water Board in March 2010, adopted by the State Water Resources Control Board in September 2010, and approved by U.S. EPA Region 9 in December 2010.

This draft proposed amendment would apply to the whole region the revised peer reviewed DO objective schema used to assess and recalculate the SSOs for DO in the Klamath mainstem. As described in Chapter 3, this includes updates to the aquatic life-based objectives and a process for calculating SSOs for DO based on natural conditions.

1.3 Goals of the Draft WQO Update Amendment

The primary goals of the draft WQO Update Amendment are to: 1) make clear and transparent the process that staff uses when translating narrative water quality objectives into numeric values protective of beneficial uses, particularly with respect to chemical constituents; and 2) amend the Basin Plan's water quality objectives to support the protection of human health and aquatic ecosystems. To accomplish these goals staff proposes that:

1) The objectives for chemical constituents for surface water and groundwater be updated to reflect current scientific understanding, more clearly apply to the protection of all beneficial uses, and more flexibly remain current;
2) A toxicity objective for groundwater be articulated, using the toxicity objective for surface water as a model;
3) The DO objectives be revised to: a) better protect sensitive aquatic organisms from depressed DO; b) better ensure that the natural pattern and range of DO variation is maintained in those waterbodies unable to meet the aquatic life-based objectives due to

natural conditions; and c) reduce the possibility that natural variation in DO is erroneously identified as DO impairment leading to improper 303(d) listings;
4) Language be added to Section 3 to explain how numeric values are identified to implement narrative water quality objectives; and,
5) Language be added to Section 4 to describe the variety of tools the Regional Water Board uses when implementing water quality standards.

1.3.1 Chemical Constituents and Groundwater Toxicity

The existing water quality objectives for chemical constituents do not reflect current scientific understanding for all parameters. The objectives for chemical constituents apply to surface water and groundwater, both of which can support domestic and municipal supply and also support numerous other beneficial uses. The specific numeric objectives for chemical constituents contained in the Basin Plan are the drinking water standards developed by the California Department of Public Health (now the State Water Board Division of Drinking Water) and described in the California Code of Regulations, Title 22, at the time the objectives were adopted in 1975 and modified in 1993, which are now outdated.

The existing objective for chemical constituents is both narrative and numeric. The first portion applies MCLs as the upper most limits to waters with the municipal and domestic water supply (MUN) beneficial use. The section portion is narrative and protects from adverse impacts to the agricultural beneficial use. The third portion applies waterbody-specifc objectives, as listed in Table 3-1, for specific conductance, total dissolved solids (TDS), DO, pH, hardness, and boron.

Therefore, the draft revisions to the objectives for chemical constituents include:

1. Revising the narrative objectives for chemical constituents to clearly apply to the protection of all beneficial uses, not just AGR.
2. Adding language regarding the prevention of nuisance, as required in Porter-Cologne.
3. Deleting the outdated Table 3-2, *Inorganic, Organic, and Fluoride Concentrations Not to be Exceeded in Domestic or Municipal Supply*.
4. Prospectively incorporating the Primary and Secondary MCLs listed in California Code of Regulations, Title 22 as the minimum water quality objectives for chemical constituents to protect the MUN beneficial use.

One of the areas requiring greater clarity is that although the Basin Plan includes objectives for chemical constituents for surface water and groundwater protection, there are other plans and policies that must be considered when regulating chemical constituents to protect beneficial uses. For this reason reference to the State Water Board *Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP) is included as part of the proposed amendment. The SIP describes the application of the National Toxics Rule (NTR) and California Toxic Rule (CTR) for the protection of human and aquatic life receptors in surface water within National Pollutant Discharge Elimination System (NPDES) Permits. Similarly, the State Water Board adopted

Resolution No. 92-49 *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304,* which directs groundwater assessment and cleanup activities. It requires that groundwater quality be returned to background conditions, where possible, in keeping with the requirements of the State Water Board Resolution No. 68-16, *Policy with Respect to Maintaining High Quality of Water* in California (Antidegradation Policy). Where not possible, Resolution No. 92-49 requires that cleanup activities result in the "best water quality which is reasonable…considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible…" That is to say that the Regional Water Board is authorized via Porter-Cologne and the plans and policies of the State Water Board to implement controls with respect to constituents that have the potential to cause groundwater toxicity. This draft proposed amendment includes the addition of a narrative groundwater toxicity objective as a mechanism to more explicitly implement numeric criteria controlling toxicity in groundwater, as otherwise required under State law.

WATER CODE SECTION 106.3
In compliance with Water Code section 106.3, it is the law of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. It is now known as the Human Right to Water (HRTW) law. This draft proposed Basin Plan amendment advances the HRTW law by updating the water quality objectives for chemical constituents, adding a groundwater toxicity objective and describing the translation of narrative water quality objectives into numeric limits to protect all beneficial uses including domestic and municipal water supply (MUN).

1.3.2 Dissolved Oxygen

This draft proposed amendment includes the revision of the region-wide DO objectives, including consideration of appropriate DO requirements in flowing waters, ephemeral waters, lakes, reservoirs, wetlands, and estuaries. The draft amendment is designed to update the existing aquatic life-based objectives to include protection against both acute and chronic effects of DO impairment. The draft amendment also addresses problems associated with Table 3-1 of the Basin Plan in which site-specific objectives (SSOs) for DO are assigned to individually named waterbodies in the Region. The problems associated with the SSOs that are to be solved include: a reliance on daytime grab sample data to define the daily minimum condition, and an inconsistency in approach to the SSOs between waterbodies in the Klamath River Basin (i.e., the Klamath River and all other waterbodies north of the California-Oregon border) and those in the North Coast Basin (i.e., all waterbodies south of the Klamath River down to San Antonio Creek at the border of Marin and Sonoma counties). Further discussion on the proposed DO amendment is presented in Chapter 3 of this Staff Report.

1.4 Regulations That Apply to Adopting Water Quality Objectives

Federal regulations require states to adopt narrative or numeric water quality criteria to protect designated uses (40 CFR §131.11(a)(1).) The State's Porter-Cologne Water Quality

Control Act refers to water quality criteria as water quality objectives and designated uses as beneficial uses. The State's terminology is used here.

California Water Code section 13050, subdivision (h) defines water quality objectives as: "…the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area."

Specific to the adoption or revision of water quality objectives and pursuant to Water Code section 13241, when adopting water quality objectives, the Regional Water Board is required to consider the following elements. Within the description of each element below, the reader is pointed to the location within the staff report where full consideration of the element is presented.

(a) *Past, present, and probable future beneficial uses of water.*
Existing and potential beneficial uses of waters in the North Coast Region are identified in the Basin Plan (Table 2-1). Surface water beneficial uses are identified for each hydrologic unit in the region. In addition, beneficial uses are identified for broad categories of waters including bays, estuaries, minor coastal streams, ocean waters wetlands, and groundwaters. For more detail see Section 1.1 of this Staff Report;

(b) *Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto*.
The draft Basin Plan amendment will revise objectives throughout the entire North Coast Region and all hydrographic units within its boundary. A description of the environmental characteristics and available quality of waters in the region is presented in Chapter 2 of this Staff Report;

(c) *Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area*.
Key pollution threats to groundwater and surface water in the region include industrial wastes, leaking petroleum tanks, septic leakage, urban and agricultural runoff, forestland and urban road runoff, and the disposal of waste to land and to surface waters. The use of best achievable technology in many cases has proven to prevent or remediate pollution, which in turn supports beneficial uses. Additionally, several areas through the region are high quality waters. For additional discussion see Section 2.3 of this Staff Report;

(d) *Economic considerations*
When adopting water quality objectives the Regional Water Board must consider the cost of compliance measures and provide information on the potential sources of funding. Additionally, economics must be considered if adverse economic impacts will result in an adverse physical impact on the environment. For a list of compliance measure costs and potential sources of funding see Chapter 6 of this Staff Report;

(e) *The need for developing housing within the region.*
The availability of consumable and usable water supplies is a necessary component of the ability to develop housing. Protecting all the beneficial uses

associated with water supply will continue to enable potential housing development. For additional information see Population and Housing discussions in Chapters 2 and 5 of this Staff Report;

(f) *The need to develop and use recycled water*.
Recycled water use has been developed and implemented throughout the Region as a means to offset potable and non-potable water uses and decrease water demand. Implementing recycled water projects in a manner protective of beneficial uses is a significant goal for the State of California. For additional discussion see Section 2.1.9 of this Staff Report; and

(g) *The Program of Implementation (Wat. Code, §13242)*
When adopting objectives the Regional Water Board must consider how the water quality objectives are achieved. This includes a description of actions necessary to take, recommendations to any entity private or public, a time schedule, and a description of surveillance (i.e., monitoring and reporting) to determine compliance. For additional discussion see Section 2.2 of this Staff Report.