

**Summary of the Joint Meeting Between the EPA Region IX RTAG and the  
California State RTAG (STRTAG).  
October 26, 2001**

Prepared for:

EPA Region IX  
75 Hawthorne Street  
San Francisco, California

State Water Resources Control Board  
1001 I Street  
Sacramento, California

Prepared by

Tetra Tech, Inc.  
3746 Mt. Diablo Blvd., Ste 300  
Lafayette, California

November 5, 2001 (revised November 26, 2001)

## **I Meeting Background**

An important element of the EPA Region IX Nutrient Criteria Program is the continued involvement of stakeholders through the Regional Technical Assistance Group (RTAG). The RTAG for nutrient criteria development in EPA Region IX has been meeting and evolving since 1998. The RTAG has increased in size since the publication of draft criteria proposed by the National Nutrient Criteria Program at U.S. EPA Headquarters. There have been several RTAG meetings and conference calls over the past two years. EPA Region IX worked with the RTAG on two pilot projects that were undertaken to develop nutrient criteria that would be more specifically tailored to *regionalization units* within Region IX. (Regionalization units defined at the meeting as geographic units and the associated waters that respond in a similar manner to nutrient inputs.)

The purpose of this joint RTAG/STRTAG meeting was to review technical background information provided by Tetra Tech and begin working on an approach for developing alternate nutrient criteria for use in EPA Region IX.

## **II Welcome and Convening of the Region IX RTAG/STRTAG (Suesan Saucerman and Kim Ward)**

Suesan Saucerman and Kim Ward welcomed everyone to the second joint meeting of the EPA Region IX RTAG and the STRTAG. Introductions by all attendees were requested since some were first time participants in RTAG proceedings. Each attendee was asked to provide their name, organizational affiliation (if any), and involvement/interest in the nutrient criteria development process. There were 19 attendees from a broad spectrum of interests (government-regulatory, private consultants, and municipal sanitation). Attendees participated either in person or via conference call. The majority of the attendees were from the regulatory community (Table 1).

---

**Table 1. Alphabetical list of Participants**

---

<b>Name</b>	<b>Agency</b>
Emily Alejandrino	RWQCB-5
Shirley Birosik	RWQCB-4
Lisa Brown	RWQCB-9
Glynnis Collins	RWQCB-2
Francisco Costa	RWQCB-7
Clayton Creager	Tetra Tech, Inc.
Dave Evans	RWQCB-1
Kris Flaig	LA County Sanitation District
Sharon Landau	LA County Sanitation District, Tri-Tac
G. Fred Lee	G. Fred Lee and Associates
Maria de la Paz Carpio-Obeso	RWQCB-7
Steve Potts	US EPA HQ
Jon Rokke	RWQCB-7
Sujoy Roy	Tetra Tech, Inc.
Suesan Saucerman	EPA Region IX
Deb Smith	RWQCB-4
Judith Unsicker	RWQCB-6
Kim Ward	SWRCB, California
Gary Wortham	Tetra Tech, Inc.

---

### **III Draft Management Briefing (Clayton Creager, Tetra Tech)**

Clayton provided an overview of the Draft Management Briefing presentation that he prepared for the State Water Resources Control Board's Management Coordinating Committee. This presentation summarized 1) the US EPA's strategy for reducing cultural eutrophication, 2) the methods used by the EPA to generate recommended nutrient criteria, 3) the status of US EPA Guidance Documents for various ecoregional waterbody types, 4) the history of the RTAG/STRTAG, 5) the proposed 304(a) nutrient criteria, 6) approved approaches for developing alternate nutrient criteria, and 7) the issues that need to be assessed before an alternate criteria can be developed.

This presentation was presented to the attendees in hard and electronic format.

Steve Potts from EPA HQ indicated that the Guidance document for Ecoregion I lakes and reservoirs will begin the peer review process in January 2002. The Ecoregion I rivers and streams has completed peer review and will be released by December 2001. The Ecoregion III Guidance document for lakes and reservoirs will also be released by the end of December 2001. EPA will not be issuing Guidance Documents for developing criteria for estuaries and coastal areas. This is because most estuaries are unique and will require a site-specific criterion. Clayton Creager indicated that Peggy Fong and Krista Kamer (both existing RTAG members) are currently performing a significant amount of research on California's estuarine system for the Southern California Coastal Water Research Program (SCCWRP) and could provide invaluable insight into the procedures that should be adopted to develop nutrient criteria for estuarine systems. Krista Kamer has indicated that she would be willing to provide the RTAG/STRTAG with a presentation of her work to date. This presentation could potentially be presented at the next meeting.

Additionally, Steve indicated that the EPA will be issuing a memo that explains EPA's position on such issues as Asubstantially significant progress@, flexibility, timing, and approach.

#### **IV Review of Technical Background Information (Tetra Tech, Inc.)**

Technical background information compiled and developed by Tetra Tech, Inc was presented during this session and included discussions on 1) the re-evaluation of ecoregional nutrient data analysis, 2) the analysis of data from the Truckee River, and 3) EPA Region IX TMDL's.

**Ecoregional Nutrient Analysis** - Sujoy Roy presented the analyses of EPA Region IX's nutrient data. This analysis used the methods described in EPA's Guidance Document for Rivers and Streams to develop nutrient criteria on an ecoregional basis using Omernick's original level III ecoregion map. The original level III map included 14 ecoregions for California versus the three used in the Aggregate Level III map. Using the original ecoregion breakdowns, allowed for a more localized criteria to be calculated.

The results indicated that, for all ecoregions where data existed, the calculated nutrient criteria were significantly greater than those 304(a) criteria proposed by EPA. Approximately 40 to 98% of the data for total phosphorus and approximately 30 to 99% of the data for total Kjeldahl nitrogen were greater than the proposed 304(a) criteria. The significance of these percentages is that most of the waterbodies in the data base would be Aout of compliance@ should EPA's 304(a) nutrient criteria become promulgated. This reinforces the appropriateness of developing alternate nutrient criteria for EPA Region IX.

A summary of these analyses was distributed to the attendees in both hard and electronic copies.

**Note:** Since the October 26 meeting, we have determined that our original assessment comparing the calculated criteria to EPA's published 304(a) criteria was flawed. Instead of comparing all of the calculated criteria to the published 304(a) criteria for total phosphorus and total nitrogen in ecoregion II rivers and streams, it would be more appropriate to compare our calculated criteria to the published 304(a) criteria for each of the sub-ecoregions within Aggregate Level III

ecoregions II and III. This comparison is presented in a table attached to this summary. Several of the individual 304(a) criteria for the sub-ecoregions are greater than the 304(a) criteria used in the original assessment, having the effect of slightly reducing the percentages of data that exceed the published 304(a) sub-ecoregional criteria. The ranges, however remained relatively similar, with 28 - 98% of the total phosphorus data being greater than the respective sub-ecoregion 304(a) criteria and 0 - 97% of the Total Kjeldahl nitrogen data being greater than their respective sub-ecoregional 304(a) criteria.

**Truckee River Nutrient Analysis** - Gary Wortham presented the analysis of the Truckee River nutrient data analysis.

Tetra Tech, Inc. was requested by the EPA Work Assignment Manager (WAM) to calculate localized *Atheoretical* nutrient criteria for the Truckee River. The Truckee River flows out of Lake Tahoe and through two states (California and Nevada). The specific objective of this particular work task was to calculate a *Atheoretical* criterion for nitrogen and phosphorus using the procedures described in the Nutrient Criteria Technical Guidance Manual: Rivers and Streams (Guidance Manual) for three different river reaches (1) California only, (2) Nevada only, and (3) California + Nevada. These criteria could then be used as a basis for a localized nutrient criteria for the Truckee River.

The Guidance Manual recommends that nutrient criteria be estimated using the 25<sup>th</sup> percentile distribution. Examination of the 25<sup>th</sup> percentile distributions indicate that criteria estimated for both TKN and TP from the California data are approximately one-third of the corresponding criteria that would be estimated from the Nevada data. A comparison of the *Atheoretical* criteria to the EPA's 304(a) criteria indicated that the national criterion values are almost identical to those derived from the Truckee River (California) data.

The data used in this analysis were pooled into a single database since no effort was made to differentiate *Areference* from *Anon-reference* conditions. In this sense, the database resembled the EPA's STORET database. Judith Unsicker (RWQCB-6) indicated that reference quality data could be available from studies currently being performed in Sagehen Creek by UC Davis and that she would provide the name of a contact person with that study. Sagehen Creek is a *Apristine* tributary to Truckee River and would provide suitable reference condition data for the Truckee River. [Judith has since provided Tetra Tech with the contact information for the Sagehen Creek study and Tetra Tech is currently pursuing the data] Additionally, Judith indicated that other data sources (USGS NWIS and Tahoe/Truckee Sanitation District) in the area should have data that we can use. Tetra Tech is actively seeking out these data and will include them in any re-evaluation of nutrient criteria for the Truckee River.

A summary of the original analysis was distributed to the attendees in both hard and electronic copies.

**EPA Region IX Nutrient TMDLs** - Clayton Creager presented a summary of the approved nutrient TMDLs for EPA Region IX. However, since some of the information was dated and incomplete, it was decided that this presentation would be re-scheduled for the next meeting.

Discussion during this session focused on the fact that, for some regions, background nutrient concentrations are greater than the proposed EPA 304(a) criteria. It was concluded that this scenario was going to be the rule rather than the exception.

## **V Nutrient Development Work Plan Discussions (All Attendees)**

This session focused the attention of the attendees on developing a work plan. The main question tackled during this session was "What form should the standard take?"

Steve Potts re-affirmed EPA's commitment to flexibility by accepting any scientifically defensible standard.

One comment regarding the EPA's 304(a) criteria was that they are presented as medians instead of means and, as such, compliance would require a significant amount of data and this might not work for nutrients. Several of the attendees concurred adding that seasonality should be incorporated into the final standard and that monthly monitoring would be more appropriate than quarterly monitoring since temporal differences could be significant.

Another approach would be to use secondary endpoints (e.g., algae, DO, pH) to assess nutrient impacts. If the secondary endpoints are "out of compliance", procedures could be implemented to "weaken" the nutrient concentrations until the secondary endpoints are back in compliance. The primary challenge to this approach was that any criterion would have to have a trigger that would be in effect prior to the degradation of beneficial uses; many of which are intricately tied to the secondary endpoints.

The attendees agreed that, while criteria must protect beneficial uses, an acceptable understanding of degradation of beneficial uses must be defined. For example, is there an "acceptable range" of "degradation" before and beneficial use is actually impaired? This could be addressed by using some type of Index that relates causal variables to response variables. The big unknown with this approach is whether the data exists to establish such a relationship. The consensus of the group was that the data does not exist and that it would take several years, maybe decades, before there are enough data to establish a relationship.

The relatively short time table that we have to develop nutrient criteria may preclude using existing monitoring efforts (SWAMP, USGS, Fish & Game) since many of these programs take years to collect enough data to be useful. A solution to this would be to use these programs as sources and establish a nutrient standard and subsequent compliance on a "sliding-scale" that can be adjusted as more data become available. Additionally, the approach should not take away the

broad discretion that Regional Boards have to set standards and should consider existing anti-degradation laws. This is consistent with the message that Jim Keating gave at the last meeting, where Aanti-deg@ could be the hook used to set the response point variable.

The discussion moved onto more waterbody specific issues when one attendee asked, AWhat approach would be used to develop nutrient criteria for the Delta?@ It was concluded that since the Delta was unique, it would most likely receive site-specific criteria. Steve Potts indicated that he would check with some contacts at EPA HQ for possible approach ideas. After the meeting, Steve approached David Flemer with this question and received the following response:

AThey may have to consider the delta emergent marshes as nutrient modulators of river and local runoff (possibly ground water and surface sheet flow, etc.) inputs. Water on flooding conditions (tidal and wind driven) may upon ebbing be low or high in D.O. and high or low in nutrients depending on whether the marsh system is a nutrient source or sink. The latter conditions will likely vary diurnally, seasonally and inter-annually, so some new data may be required to characterize the situation. It may turn out if the marsh/open water channel is light limited, then the load/concentration may have greater effects downstream. Episodic events need to be considered because their signature may last a year or so, so some consideration to duration, magnitude and frequency seems appropriate. Also, during the summer the marsh may remineralize the organic nutrient fractions and make these nutrients more available locally or downstream. I am unfamiliar with the seasonal nutrient loading pattern but that needs to be considered. I doubt the reference concept as per other similar systems will prove to be useful but historical data and modeling would more likely be useful.@

Other waterbody specific questions that arose were related to Effluent Dominated Streams (EDS) and whether nutrient criteria should be driven by the most downstream waterbody type (e.g., estuaries).

**EDS** - It was agreed that EDS could play important roles in downstream nutrient loadings and must be incorporated into any workplan that the group develops. Suesan reminded the group that EPA Region IX is sponsoring a study on EDS in Arizona which might be able to provide some useful information, especially with respect to desert conditions.

**Estuaries** - Since all estuaries are downstream of some other waterbody type (e.g., rivers) upstream criteria could potentially impact beneficial uses of the estuary. This would indicate that criteria should first be developed for the most downstream component and then working upstream. While this approach seems simple, it is not. Some estuaries are highly influenced by upstream sources (e.g., small estuary/large river), while others are less influenced (e.g., large estuary/small river). This could be incorporated into the development workplan using a broad-based approach. For example, in situations where the input into the estuary is large, criteria would be driven by the estuary, while situations where the reverse is true (i.e., small tributary

influence) criteria would be based on the upstream segment. In either case, beneficial uses must be maintained for all waterbody types.

Regardless of the waterbody type (Delta, EDS, or estuary), it was agreed that the workplan needs to incorporate some means to assure that upstream sources do not impair downstream waterbodies. Especially since EPA's Water Quality Standards procedures require that impacts to downstream waterbodies must be considered when developing criteria.

It was suggested that the best approach might be to follow EPA Guidance and utilize both causal (nutrients) and response variables (chl-a, turbidity?, % periphyton, etc.). Turbidity was questioned since it is difficult to distinguish between algal and mineral turbidity. Additionally, physical variables like the ones described by Rosgen should be included.

The group was reminded that, while this approach is ideal, the data do not exist to develop criteria in this manner. In light of this, it was suggested that the dataset might have to incorporate some informal data and that *Best Professional Judgment* be used instead of the more formal approach recommended by EPA.

Ultimately, the group felt that there were additional data that could be mined. However, Regional Board staff were overly taxed and would find it difficult, if not impossible to search for it. Tetra Tech indicated that it would provide select staff from each of the Regional Boards and other entities with a list of needed parameters from specific waterbodies and that Gary would personally collect the data, thus reducing the level of effort required by Regional Board staff. Once the data are acquired, only those parameters that can be quantitatively linked to a response variable would be incorporated into the final dataset.

Steve Potts indicated that he would forward to the group a list of alternative methods being used by other EPA Regions.

A small, sub-group was created with the initial objective of defining regionalization units and identifying stratification criteria. This group will include one member from each of the Regional Boards and representative stakeholders. Since all Regional Boards were not represented at the meeting, some slots remain. Technical expertise will be provided by Don Porcella (UCB), John Reuter (UCD), and Peggy Fong (UCLA).

The group decided that regular communication was important and Suesan committed to planning monthly conference calls to occur on the last Tuesday of each month from 2 - 4 PM. The next conference call is scheduled for 11/27/01 from 2 - 4 PM (Pacific).

## **VI Next Steps**

The following Next Step were recommended by the group:

- \$ Tetra Tech to prepare a *White Paper* on nutrient standard forms that includes such factors as response variables, causal variables, and physical habitat. This paper will provide a discussion of the usefulness/difficulties involved in using these parameters to



- develop nutrient criteria for each region.
- \$ Summarize alternate approaches being used by other EPA Regions
- \$ Summarize approved Nutrient TMDLs for EPA Regions IX & X
- \$ Assess the usefulness of Source Water Protection Plans as potential data sources
- \$ Tetra Tech will provide each Regional Board and Stakeholder a list of necessary parameters from specific waterbody types and schedule a date to personally collect the data.
- \$ Tetra Tech will create a user-friendly web site that can be used by all members for expedient exchange of information.

## Nutrient Data Plot Summary

Ecoregion *	Total Phosphorus (approx. mg/L)					Total Kjeldahl Nitrogen (approx. mg/L)				
	304(a) Criterion	Reference 75%	% > 304(a)	STORET 25%	% > 304(a)	304(a) Criterion	Reference 75%	% > 304(a)	STORET 25%	% > 304(a)
1	0.010	0.03	70	0.01	70	0.13	na	na	0.17	85
5	0.015	0.04	85	0.02	85	0.29	0.36	33	0.22	62
6	0.030	na	na	0.06	88	0.50	na	na	0.40	69
8	0.011	na	na	0.002	44	0.52	na	na	0.10	17
9	0.030	0.13	67	na	na	0.15	0.40	97	na	na
14	0.010	0.03	47	0.03	80	0.67	0.25	0	0.55	66
22	0.015	0.07	62	0.02	97	0.23	0.48	60	0.18	47
23	0.011	0.06	85	0.005	85	0.28	0.48	58	0.13	47
24	0.018	0.07	56	na	na	0.62	0.32	12	na	na
78	0.032	0.05	28	0.12	98	0.53	0.58	25	na	na

\* Ecoregion Key:

- 1 Coastal Range
- 5 Sierra Nevada
- 6 Southern and Central California Chaparral and Oak Woodlands
- 8 Southern California Mountains
- 9 Eastern Cascades Slopes & Foothills
- 14 Southern Basin & Range
- 22 Arizona/New Mexico Plateau
- 23 Arizona/New Mexico Mountains
- 24 Southern Deserts
- 78 Klamath Mountains