

Central Valley Regional Water Quality Control Board

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State Water Resources Control Board

FROM: Ken Landau
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CENTRAL VALLEY REGION
REGIONAL WATER QUALITY CONTROL BOARD

DATE: 31 August 2012

SUBJECT: REQUEST FOR EXTERNAL TECHNICAL PEER REVIEW OF A PROPOSED
BASIN PLAN AMENDMENT TO ADDRESS BENEFICIAL USES FOR
GROUNDWATER AT THE ROYAL MOUNTAIN KING MINE SITE, CALAVERAS
COUNTY

The Central Valley Regional Water Quality Control Board ("Central Valley Water Board") requests that you initiate the process to identify reviewers to provide external technical peer review of science-based elements of the proposed Basin Plan Amendment (the "Proposed Amendment"), per the requirements of Health and Safety Code section 57004. The proposed Basin Plan Amendment is tentatively scheduled to be considered by the Central Valley Water Board in August 2013. The staff report and supporting technical documents are ready for review. We would like for peer review to be completed by November 2012 in order to have sufficient time to complete the public participation requirements by March 2013.

The Proposed Amendment will affect beneficial use designations and their implementation at the approximately 2,100-acre Royal Mountain King Mine Site ("RMKM Site") in western Calaveras County. For specific portions of the RMKM Site, where naturally-occurring groundwater is of poor quality, the Proposed Amendment will:

- De-designate the municipal and domestic supply ("MUN") beneficial use;
- Set a site-specific objective or de-designate the agricultural supply ("AGR") beneficial use;
- Set a variance for the industrial supply ("IND") and the industrial processing ("PRO") beneficial uses specific to several constituents.

Attachment 1 provides a summary of the proposed action. The Proposed Amendment will address a need for regulatory flexibility to close the RMKM Site.

We recommend that the external peer reviewers have expertise in hydrology in fractured bedrock and in livestock health, particularly with respect to salinity tolerances in water. Attachment 2 is a listing of the specific scientific issues that we would like the reviewers to address. Attachment 3 contains a list of the persons who have participated in the development of this proposal.

If you have any questions, please contact either Gene Davis at (916) 464-4687 or Sue McConnell at (916) 464-4798.

Attachments--**Revised**

cc: Rik Rasmussen, Division of Water Quality, State Water Resources Control Board, Sacramento

Attachment 1--Revised

Basin Plan Amendment to Provide Appropriate Beneficial Use Protection for Groundwater at the Royal Mountain King Mine Site, Calaveras County

Summary of Proposed Action

I. Summary

The Central Valley Water Board staff is proposing a basin plan amendment that will:

1. De-designate the municipal and domestic supply (MUN) beneficial use of groundwater occurring within the western portion of the RMKM Site.
2. De-designate the agricultural supply (AGR) beneficial use within the southwestern portion of the RMKM Site.
3. Establish a site-specific objective of 5,000 mg/L of TDS in groundwater to maintain protections for a limited AGR use (cattle watering) of groundwater within the northwestern portion of the RMKM Site.
4. Establish a variance exempting certain constituents from consideration when setting limits pertaining to the industrial supply and process (IND and PRO, respectively) beneficial uses of groundwater within the western portion of the RMKM Site.

The Basin Plan considers all groundwaters in the Sacramento and San Joaquin Basins as suitable or potentially suitable, at a minimum, for the municipal and domestic supply (MUN) use, the agricultural supply (AGR) use, the industrial service supply (IND) use, and the industrial process supply (PRO) use. The Basin Plan also incorporates the *Sources of Drinking Water Policy* (State Water Board Resolution 88-63), which provides criteria for making exceptions to the MUN use designation. In the draft Staff Report, Central Valley Water Board staff demonstrate that one of the exception criteria in the *Sources of Drinking Water Policy* is met within the western portion of the RMKM Site, which supports the removal of the MUN designation.

Meridian Beartrack Company ("MBC") and its partners mined for gold at the RMKM Site from March 1989 to June 1994. Since mining operations ceased at the RMKM Site, MBC has been working to close the site. The RMKM Site, which is located just south of Salt Spring Valley, has several known, naturally-occurring, saline springs.

Groundwater quality data has been collected at the RMKM Site from 1987 (prior to RMK's mining operations) to the present (after RMK's mining operations and during its ongoing post-mining site closure activities). The data indicate that groundwater within the western portion of the RMKM Site contains levels of TDS in excess of 5,000 mg/L and, within a more limited portion of the RMKM Site, in excess of 10,000 mg/L.

We are requesting peer reviewers to evaluate whether the basis for each of several specific components of the proposed Basin Plan Amendment are supported with sound scientific observations and principles.

II. Rationale

The Board proposes to de-designate the MUN beneficial use at a portion of the RMKM Site based on exception criteria in the *Sources of Drinking Water Policy*, which authorizes exemptions to the MUN designation where levels of TDS exceed 3,000 mg/L and where the Board finds that the groundwater is not reasonably expected to supply a public water system.

The Board proposes to de-designate the AGR beneficial use where the groundwater contains TDS levels exceeding 5,000 mg/L (including areas where TDS exceeds up to 10,000 mg/L), as this poor-quality groundwater is not expected to support any known AGR use. Where groundwater is slightly better, the Board proposes to set a site-specific objective for the AGR use that would protect livestock watering.

For the portion of the RMKM Site where the groundwater supports stock watering, a site-specific objective will be implemented based on National Academy of Sciences guidance for protecting livestock watering, which states that water up to 5,000 mg/L may be used for this purpose (NAS, 1974).

The Board also proposes to establish a variance that will exempt certain constituents from consideration when the Board sets limits pertaining to the IND and PRO beneficial uses of groundwater within the western portion of the RMKM Site, but this measure is a policy determination and is not based on scientific criteria.

III. Methodology

Based on demonstrable geologic and groundwater occurrences and conditions, the RMKM Site can be divided into two major areas (“portions”) – western and eastern. The western portion is itself composed of two portions – northwestern and southwestern. An east-west line representing the division of the western portion into the northwestern and southwestern portions is located just north of the North Pit rim. By dividing of the RMKM Site into portions with internally similar hydrogeological conditions, the Basin Plan Amendment will help MBC move the RMKM Site towards closure by specifying reasonably attainable water quality requirements within each portion. **This is because groundwater quality and quantity vary greatly across the Site, between portions and even (though to a lesser degree) within portions.**

A northwest-trending conceptual line that separates the western and eastern portions of the RMKM Site is proposed approximately 1,000 feet east of the probable trace of the Littlejohns Fault. The dividing line is based on the probable easternmost extent of poor-quality water in the western portion of the RMKM Site, as approximated by the mapped trace of the Littlejohns Fault Zone, plus a 1,000-foot buffer to accommodate uncertainties and variations in the locations and characteristics of subsurface hydrogeological features and groundwater conditions across the RMKM Site. These features include the shallowest likely dip of the Littlejohns Fault Zone, the distribution and variable quality of groundwater in monitoring wells at the RMKM Site, the general directions of groundwater flow and gradient, zones of vertical or lateral lithologic gradation or abrupt transition, fault-bounded juxtapositions of phyllite and greenstone blocks and slices at depth, and the locations, orientations, interconnectedness, and transmissivity of cross joints and other unmapped or hidden subsurface geologic features. The groundwater within the western portion of the RMKM Site does not fully support the MUN use because levels of TDS exceed 3,000 mg/L, which qualifies this portion for an exception to the MUN designation in accordance with the *Sources of Drinking Water Policy*.

In addition, poor-quality groundwater within the southwestern portion of the RMKM Site does not support the full range of the AGR beneficial use. The high TDS levels (up to, and over, 10,000 mg/L) that occur in groundwater within the southwestern portion of the RMKM Site render the groundwater unfit for AGR uses in that area. The Board proposes to de-designate the AGR use within the southwestern portion of the RMKM Site.

The groundwater quality (TDS levels up to 5,000 mg/L) within the northwestern portion of the Site supports only limited AGR uses, specifically cattle watering. Therefore, including a site-specific water quality objective of 5,000 mg/L TDS in the proposed Basin Plan Amendment would maintain protection for this limited AGR use (rather than fully eliminating all AGR protections) in the northwestern portion of the RMKM Site.

Groundwater in the western portion of the Site cannot be utilized for the full range of the IND and PRO uses due to naturally high concentrations of certain constituents. The Board proposes to exempt certain constituents from consideration when the Board sets limits pertaining to the IND and PRO beneficial uses in the western portion of the Site.

IV. References

- Clark, L.D. 1964. Stratigraphy and Structure of Part of the Western Sierra Nevada Metamorphic Belt. United States Geologic Survey Professional Paper 410. Menlo Park, California. 70 p.
- Clark, L.D. 1970. Geology of the San Andreas 15-Minute Quadrangle, Calaveras County, California. California Division of Mines and Geology Bulletin 195. San Francisco, California.
- Kuhl, T.O. and M.J. Lechner. 1990. An Updated Structural Interpretation at the Royal Mountain King Mine, Calaveras County, California, Presented at the SME Gold Tech IV Meeting, Reno, Nevada, September 10-12.
- Lechner, M.J. and T.O. Kuhl. 1990, Geology of the Royal Mountain King Mine, Presented at the 96th Annual Northwest Mining Association Convention, Spokane, Washington, December 5-7.
- National Academy of Sciences (NAS). 1974. Nutrients and Toxic Substances in Water for Livestock and Poultry: A Report of the Subcommittee on Nutrient and Toxic Elements in Water. Washington, D.C. 93 p.
- SES. 2012. Response to RWQCB Requests for Additional Information. Memorandum prepared by SES, Inc. 21 June 2012
- Taliaferro, N.L. and A.J. Solari. 1949. Geologic Map of the Copperopolis Quadrangle, California.
- USEPA. 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance. EPA 530/R-09-007. Office of Resource Conservation and Recovery. March 2009.

Attachment 2--Revised

Basin Plan Amendment to Provide Appropriate Beneficial Use Protection for Groundwater at the Royal Mountain King Mine Site, Calaveras County

Description of Scientific Issues to be addressed by Peer Reviewers

The statutory mandate for external peer review (Health & Saf. Code, § 57004) requires the reviewer to determine whether the foundations of a rule that are premised upon, or derived from, empirical data or other scientific findings, conclusions, or assumptions are based upon sound scientific knowledge, methods, and practices.

We request that you make this determination for the issues specified below. Peer review is required for elements that are not based on previously peer reviewed science. The *Sources of Drinking Water Policy* (State Water Board Resolution 88-63) is based on previously peer-reviewed science, and of itself, does not require peer review. Central Valley Water Board staff has identified two specific topics for which we seek scientific peer review and comment. The topics are stated below, followed by additional information to provide context for the reviewer.

1. The proposed boundaries for de-designating the MUN beneficial use of groundwater in the western portion of the RMKM Site and for de-designating the AGR beneficial use in the southwestern portion of the Site are scientifically reasonable and defensible interpretations of the geological and hydrological conditions. **Although groundwater quality and quantity vary greatly across the RMKM Site, the differences are generally less between monitoring wells within each Site portion. (See Section 1.2 Background and Need for Proposed Basin Plan Amendment.)**

De-designation of the MUN beneficial use is based on meeting one of the exception criteria of the *Sources of Drinking Water Policy* (levels of TDS exceed 3,000 mg/L). De-designation of the AGR beneficial use is based on existing background levels of TDS that range up to, and over, 10,000 mg/L. These high levels of TDS render the groundwater unusable for any known AGR use. Groundwater data and geologic site information indicate that the groundwater can exceed 3,000 mg/L TDS in the western portion of the Site and it can exceed 5,000 mg/L TDS in the southwestern portion of the Site.

2. The proposed site-specific objective of 5,000 mg/L for TDS will continue to support livestock watering in the northwestern portion of the RMKM Site. **(See Section 2.2 Agricultural Supply.)**

Groundwater with TDS levels up to 5000 mg/L supports livestock watering for cattle, sheep, swine and horses in accordance with National Academy of Sciences' guidelines in "A Guide to the Use of Saline Waters for Livestock and Poultry." (NAS, 1974.)

Continuing intrawell monitoring and analysis of groundwater quality data will enable the Central Valley Water Board to identify changes to groundwater conditions that could trigger a regulatory response. Intrawell analysis within each proposed Site portion is appropriate for the RMKM Site because background water quality can vary substantially from one portion to the next and, in some cases, from one well to the next within each portion. These existing variations indicate that intrawell statistical comparisons of dissolved constituents would provide more meaningful information than would only interwell analysis. (USEPA, 2009). The use of intrawell monitoring at the RMKM Site does not require technical peer review because it has already been used in a regulatory context at the RMKM Site to determine background quality and compliance with permit conditions.

The Big Picture

Reviewers are not limited to addressing only the scientific issues presented above, and are asked to contemplate the broader perspective.

Attachment 2

- (a) In reading the staff technical report and proposed Basin Plan language, are there any additional scientific issues that are part of the scientific basis of the proposed de-designation rules not described above? If so, please comment with respect to the statute language given above.
- (b) Taken as a whole, is the scientific portion of the proposed rule based upon sound scientific knowledge, methods, and practices?

Reviewers should also note that some proposed actions may rely significantly on professional judgment where available scientific data are not as extensive as desired to support the statute requirement for absolute scientific rigor. In these situations, the proposed course of action is favored over no action.

The preceding guidance will ensure that reviewers have an opportunity to comment on all aspects of the scientific basis of the proposed Board action. At the same time, reviewers also should recognize that the Board has a legal obligation to consider and respond to all feedback on the scientific portions of the proposed rule. Because of this obligation, reviewers are encouraged to focus feedback on the scientific issues that are relevant to the central regulatory elements being proposed.

Attachment 3

Basin Plan Amendment to Provide Appropriate Beneficial Use Protection for Groundwater at the Royal Mountain King Mine Site, Calaveras County

Individuals Involved in Development of this Basin Plan Amendment

Ross Atkinson, Central Valley Water Board

Sarah Bortz, SES, Inc.

Gene Davis, Central Valley Water Board

Ian Hutchison, SES, Inc.

Victor Izzo, Central Valley Water Board

Sue McConnell, Central Valley Water Board

Tom Patterson, SES Inc.

Patrick Pulupa, State Water Board, Office of Chief Counsel

Rik Rasmussen, State Water Board

Mark Trevor, SES, Inc.

Betty Yee, Central Valley Water Board