

## Lower San Joaquin River Committee of CV-SALTS



10 December 2010

Mona Shulman, Chair  
Executive Committee  
CV-SALTS  
c/o Pacific Coast Producers  
631 N. Cluff Avenue  
Lodi, CA 95240-0756

### SUBJECT: NEED FOR WATER QUALITY CRITERIA INFORMATION

As part of our effort to prepare a Basin Plan Amendment for establishing water quality objectives for salinity and boron, the Lower San Joaquin River (LSJR) Committee of CV-SALTS conducted an initial review of two draft reports on water quality criteria for boron and salinity. These two reports were prepared by staff of the Regional Board in the late 1990s however neither were subjected to public or peer review. These two reports, along with water quality criteria for crop tolerance and drinking water supplies were to serve as the baseline scientific criteria for recommending water quality objectives.

The LSJR Committee feels that additional work to update the two draft Regional Board staff reports is needed. These reports need to be updated into a form that can undergo public and peer review. They are not in that form at the present time. Unfortunately, the LSJR Committee does not have funding available to complete such work. The CAA funding made available to the LSJR Committee does not allow expenditures for such a review. This conclusion is based on the resolution approving the funds by the State Water Board.

The two reports were initially developed for the establishment of water quality objectives on the Lower San Joaquin River; however the information within them will be useful to all the efforts within the Central Valley and thus the entire CV-SALTS effort. It seems prudent and more cost effective if the effort to update these two reports was done under the broader CV-SALTS umbrella rather than only in the LSJR Committee. We would hope this effort could be directly managed by the CV-SALTS Technical Committee with a defined completion date to enable the LSJR Committee to complete its work in a timely manner.

We would appreciate the Executive Committee concurrence that the Technical Committee should undertake and manage a review of scientific water quality criteria for boron and salinity for selected beneficial uses. The uses most critical to the LSJR Committee would be fish and other aquatic life uses, wildlife uses including waterfowl, and non-irrigation agricultural uses such as stock watering and animal drinking water. The LSJR Committee feels that the animal drinking water evaluation will also provide valuable information for wildlife as it may have similar tolerances. In the absence of other information, the LSJR Committee would assume any findings for animal drinking water would apply to wildlife as well.

## Lower San Joaquin River Committee of CV-SALTS

A recent review of criteria for human health and drinking water uses (both municipal and domestic) was recently conducted as part of the development of a drinking water policy and the LSJR Committee has reviewed this work and feels this recent analysis is sufficient for the CV-SALTS effort and should not be repeated.

The remaining water quality criteria need is for irrigated agriculture. The present Crop Tolerance study that was conducted by Regional Board staff is not completed. The LSJR Committee members will be reviewing this document at a future meeting to determine what additional work is needed to complete this study. We will consult with you and the Technical Committee on how best to complete this study.

Fortunately many of the references that were used in the original draft Regional Board staff reports on salinity and boron are still available and we can arrange with the Regional Board to make copies of those available to who ever conducts the update study.

To assist in implementation of an updated review, LSJR Committee members have prepared an initial draft scope of work for both the wildlife and aquatic life use and the animal drinking water reviews (Attachment #1 and #2, respectively). These would be needed by the Technical Committee to initiate, manage and conduct the study suggested above.

The LSJR Committee has made an estimate of the cost to conduct the animal drinking water evaluation at \$29,000 and the aquatic life criteria evaluation at a level likely twice that of the animal drinking water evaluation. A more accurate estimate could be obtained during the RFP process used by the Technical Committee.

If you have any questions regarding this request, please contact Dennis Westcot at (530) 758-8633.

Dennis W. Westcot  
Co-Chair  
Lower San Joaquin River  
Committee of CV-SALTS

David Cory  
Co-Chair  
Lower San Joaquin River  
Committee of CV-SALTS

cc: Daniel Cozad, Executive Director, CV-SALTS (*sent via electronic mail*)

**Central Valley Salinity Coalition (CVSC)  
 Evaluation of Wildlife and Aquatic Life Water Quality Criteria for  
 Salinity and Boron  
 Exhibit 1  
 Scope of Work  
 10 December 2010**

The objective of this project is for the CVSC to hire an entity (herein referred to as Consultant) to identify 1) water quality criteria that could be used to establish water quality objectives and 2) water quality objectives, standards, goals, and policies that have been established to protect wildlife (WILD) and aquatic life beneficial uses (BIOL, Freshwater Habitat/WARM, COLD). The Consultant will accomplish these objectives through literature and internet searches and through interviews with resource management specialists and university researchers in California, other states, and if needed, other countries. Once Tasks 1 - 5 are completed, the consultant will present the results to a CV-SALTS Technical Work Group before work is initiated on Task 6. For each of the tasks, a reference list will be prepared and provide to the CVSC along with a copy of each reference listed. Task 6 will be further defined in conjunction with the Technical Work Group after completion of Tasks 1 through 5.

**Task 1 Review California Regional Water Board Basin  
 Plans and Policies**

The objective of this task is to determine if any of the nine Regional Water Boards have adopted numerical or narrative objectives with translators for protection of wildlife and aquatic life beneficial uses for the constituents listed in Table 1. The consultant will review each of the Water Quality Control Plans (Basin Plans) prepared by the nine Regional Water Boards for the constituents listed below. The consultant will develop a standard format for summarizing the information from each Basin Plan.

**Table 1. Constituents of Concern for Wildlife and Aquatic Life Beneficial Uses**

<b>Constituent Class</b>	<b>Specific Constituents</b>
Dissolved Minerals	Total Dissolved Solids (TDS), Specific Conductance (EC), Sodium (Na), Chloride (Cl), Sulfate (SO <sub>4</sub> ), Calcium (Ca), Magnesium (Mg)
Trace Elements	Boron (B)
Nutrients	Nitrogen species (total, total Kjeldahl, organic, nitrate, nitrite, ammonia) Phosphorus species (total, dissolved)

***Numerical Objectives or Criteria*** – The consultant will conduct a review of each Basin Plan to determine if numerical water quality objectives for protection of wildlife and

aquatic life beneficial uses have been established for any of the constituents listed in Table 1. If numerical objectives have been established, the consultant will conduct interviews or research to identify the scientific findings upon which the objectives were based.

***Narrative Objectives*** – The consultant will conduct a review of each of the Basin Plans to determine if water quality criteria are being used to translate narrative objectives into numerical effluent limitations or objectives to protect wildlife and aquatic life beneficial uses. If needed, the consultant will conduct interviews or research to identify the scientific basis used to translate narrative objectives into numerical effluent limitations or objectives.

***Nutrient Criteria*** – The consultant will research whether nutrient criteria have been developed in any of the Basin Plans for protection of wildlife and aquatic life beneficial uses.

***Deliverable*** – The consultant will prepare a memorandum summarizing the information obtained in this task; present the results at a CV-SALTS Technical Work Group meeting; respond to Work Group comments on the memorandum; and prepare a final memorandum.

## **Task 2 Review Procedures, Policies, and Guidance Used by Other California Agencies**

The objective of this task is to establish whether the California Department of Fish and Game (CDFG) and the University of California (UC) have developed guidelines for salinity, boron or nutrients for protection of wildlife and aquatic life beneficial uses. CDFG is responsible for protecting wildlife and aquatic life in California and UC conducts innovative research leading to the development of criteria needed for protecting wildlife and aquatic life beneficial uses.

***Procedure Review*** - The consultant will conduct a review of all guidelines on salinity, boron and nutrients used by CDFG and UC for protecting wildlife and aquatic life beneficial uses.

***Deliverables*** – The consultant will prepare a memorandum summarizing the information obtained in this task; present the results at a CV-SALTS Technical Work Group meeting; respond to Work Group comments on the memorandum; and prepare a final memorandum.

**Task 3 Review Procedures, Policies, and Guidance Used by the U. S. Environmental Protection Agency (US EPA), U. S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS) and the U. S. Geological Survey (USGS)**

The objective of this task is to gain an understanding of methodologies used by US EPA to establish ambient water quality criteria for the protection of wildlife and aquatic life beneficial uses and procedures and guidelines used by the USFWS, NMFS and USGS for water quality protection for wildlife and aquatic life beneficial uses for the constituents listed in Table 1.

*Water Quality Criteria for Wildlife and Aquatic Life Beneficial Uses* – The consultant will conduct research and interviews to identify if US EPA, USFWS, NMFS or the USGS have published salinity, boron or nutrient source water guidance or water quality criteria for the protection of wildlife and aquatic life beneficial uses. Document the references used in this review including source books such as the Blue Book, Red Book or Gold Book.

*Deliverables* – The consultant will prepare a memorandum summarizing the information obtained in this task; present the results at a CV-SALTS Technical Work Group meeting; respond to Work Group comments on the memorandum; and prepare a final memorandum.

**Task 4 Conduct a Review of Water Quality Criteria Available in Peer Reviewed Articles**

The objective of this task is to review the peer-reviewed literature to determine if scientific information is available for the constituents listed in Table 1 upon which criteria for protection for wildlife and aquatic life beneficial uses can be established.

*Conduct an Extensive Literature Search* – The consultant will conduct internet and other database searches for information on water quality impacts to wildlife and aquatic life beneficial uses for constituents listed in Table 1. Focus in this task is to be on peer-reviewed journal articles, other published research and reviews conducted by organizations such as the National Academy of Science.

*Deliverable* – The consultant will prepare a memorandum summarizing the information found in the literature search along with an extensive reference list. The reference list should include all articles reviewed, even those not used or cited in the summary; present the results at a CV-SALTS Technical Work Group meeting; respond to Work Group comments on the memorandum; and prepare a final memorandum.

### **Task 5 Prepare a Complete Reference List of All Documents Considered**

The objective of this task is to prepare for the Basin Plan Administrative Record all documents reviewed or considered even when not used in the final analysis.

**Develop an Exhaustive Reference List** – The consultant will develop an extensive reference list of any and all documents used in this review even when the documents were not used in the final analysis.

**Deliverables** – The consultant will prepare a list of all references considered or reviewed. The list will be prepared in a format used for scientific articles and include the author (s), article title, cited source or location of the article, publication date and other information that would enable a reviewer to locate the document in a scientific journal, library or internet site. The consultant will make available copies of all documents reviewed during the course of this study in the order that they are shown in the reference listing.

### **Task 6 Develop a Range of Potential Water Quality Goals and Policies**

The objective of this task is to analyze the information obtained in Tasks 1 through 5 to develop a range of water quality criteria that are potentially applicable to the Central Valley. This task will be defined in more detail after completion of Tasks 1 through 5 but will likely include development of a range of potential water quality criteria and their relevance to the Central Valley for each of the constituents listed in Table 1.

### **Schedule**

Tasks 1 through 5 are to be completed within three months of the date of authorization to proceed. The Consultant should provide a schedule showing completion dates for each task. The schedule should take into consideration that the CV-SALTS Technical Work Group meets monthly and will require two weeks for review of Consultant draft submittals. The schedule for completion of Task 6 will be determined in conjunction with the CV-SALTS Technical Work Group.

### **Funding Needed (est.)**

<b>Task 1: \$2,000</b>
<b>Task 2: \$2,000</b>
<b>Task 3: \$10,000</b>
<b>Task 4: \$25,000</b>
<b>Task 5: \$3,000</b>
<b><u>Task 6: \$10,000</u></b>
<b>Total: \$52,000</b>

**Central Valley Salinity Coalition (CVSC)  
Evaluation of Animal Drinking Water Quality Criteria for  
Salinity and Boron  
Exhibit 1  
Scope of Work  
10 December 2010**

The objective of this project is for the CVSC to hire an entity (herein referred to as Consultant) to identify 1) water quality criteria that could be used to establish water quality objectives and 2) water quality objectives, standards, goals, and policies that have been established to protect animal<sup>1</sup> drinking water supplies. The Consultant will accomplish these objectives through literature and internet searches and through interviews with regulatory agency staff, animal extension specialists and university researchers in California, other states, and if needed, other countries. Once Tasks 1 - 5 are completed, the consultant will present the results to a CV-SALTS Technical Work Group before work is initiated on Tasks 6 and 7. For each of the tasks, a reference list will be prepared and provide to the CVSC along with a copy of each reference listed. Task 8 will be further defined in conjunction with the Technical Work Group after completion of Tasks 1 through 7.

**Task 1 Review California Regional Water Board Basin  
Plans and Policies**

The objective of this task is to determine if any of the nine Regional Water Boards has adopted numerical or narrative objectives with translators for protection of animal drinking water for the constituents listed in Table 1. The consultant will review each of the Water Quality Control Plans (Basin Plans) prepared by the nine Regional Water Boards for the constituents listed below. The consultant will develop a standard format for summarizing the information from each Basin Plan.

**Table 1. Constituents of Concern for Animal Drinking Water**

<b>Constituent Class</b>	<b>Specific Constituents</b>
Dissolved Minerals	Total Dissolved Solids (TDS), Specific Conductance (EC), Sodium (Na), Chloride (Cl), Sulfate (SO <sub>4</sub> ), Calcium (Ca), Magnesium (Mg)
Trace Elements	Boron (B) <sup>2</sup>
Nutrients	Nitrogen species (total, total Kjeldahl, organic, nitrate, nitrite, ammonia) Phosphorus species (total, dissolved)

<sup>1</sup> Throughout this document, animal will refer to all classes of animals including cattle, dairy cattle, sheep, swine, goats, horses, poultry and other types of domestic livestock.

<sup>2</sup> Molybdenum (Mo) has already been reviewed by the Regional Board and a full report is available.

***Numerical Objectives or Criteria*** – The consultant will conduct a review of each Basin Plan to determine if numerical water quality objectives for protection of animal drinking water have been established for any of the constituents listed in Table 1. If numerical objectives have been established, the consultant will conduct interviews or research to identify the scientific findings upon which the objectives were based.

***Narrative Objectives*** – The consultant will conduct a review of each of the Basin Plans to determine if water quality criteria are being used to translate narrative objectives into numerical effluent limitations or objectives to protect animal drinking water supplies. If needed, the consultant will conduct interviews or research to identify the scientific basis used to translate narrative objectives into numerical effluent limitations or objectives.

***Nutrient Criteria*** – The consultant will research whether nutrient criteria have been developed in any of the Basin Plans for protection of animal drinking water sources.

***Deliverable*** – The consultant will prepare a memorandum summarizing the information obtained in this task; present the results at a CV-SALTS Technical Work Group meeting; respond to Work Group comments on the memorandum; and prepare a final memorandum.

## **Task 2 Review Procedures, Policies, and Guidance Used by Other California Agencies**

The objective of this task is to gain an understanding of the procedures used by the California Department of Food and Agriculture (CDFA) and the University of California Cooperative Extension Service (UC Coop Ext) when developing guidelines to maintain the safety of an animal drinking water supply. CDFA is responsible for protecting animal health and the UC Coop Ext is responsible for researching and establishing guidelines for protecting animal health and animal drinking water.

***Procedure Review*** - The consultant will conduct a review of guidelines or procedures used by CDFA and UC Coop Ext for protecting the quality of animal drinking water supplies.

***Deliverables*** – The consultant will prepare a memorandum summarizing the information obtained in this task; present the results at a CV-SALTS Technical Work Group meeting; respond to Work Group comments on the memorandum; and prepare a final memorandum.

### **Task 3 Review Procedures, Policies, and Guidance Used by the U.S. Environmental Protection Agency (US EPA)**

The objective of this task is to gain an understanding of methodologies used by US EPA to establish ambient water quality criteria for the protection of animal drinking water supplies.

*Water Quality Criteria for Animal Drinking Water* – The consultant will conduct research and interviews to identify if US EPA has published source water or water quality criteria for the protection of animal drinking water supplies. Document the references used in this review including source books such as the Blue Book, Red Book or Gold Book.

*Deliverables* – The consultant will prepare a memorandum summarizing the information obtained in this task; present the results at a CV-SALTS Technical Work Group meeting; respond to Work Group comments on the memorandum; and prepare a final memorandum.

### **Task 4 Identify Water Quality Criteria, Goals, Guidelines or Policies Adopted by Other States**

The objective of this task is to determine if other states with conditions similar to California have adopted animal drinking water quality criteria, objectives, guidance, guidelines or goals for the constituents listed in Table 1 or have adopted policies to protect animal drinking water supplies. In addition this task will look at guidance or research results prepared by University or State Cooperative Extension Services in other states for protection of animal drinking water.

*Identify List of States to Contact* – In conjunction with the CV-SALTS Technical Work Group, the consultant will identify a list of states to be considered. This list will consist of states that are known to be progressive in the protection of source water quality based on the experience of the Work Group and the Consultant. Initial efforts will concentrate in the Western States.

*Conduct Research and Interviews* – The consultant will search state extension service or university websites for state regulations, guidelines or research findings on the impact of the constituents listed in Table 1 on animal drinking water or health. Where needed, the consultant will conduct interviews with researchers or extension advisors in the designated states to identify any objectives, criteria, guidelines or policies that have been adopted. The consultant will document the basis for the objectives, criteria or guidelines found.

*Deliverables* – The consultant will prepare a memorandum summarizing the information obtained in this task; present the results at a CV-SALTS Technical Work Group meeting;

respond to Work Group comments on the memorandum; and prepare a final memorandum.

### **Task 5 Identify Water Quality Goals or Policies Adopted by Other Countries or International Organizations**

The objective of this task is to determine if other countries with similar climatic conditions to California or organizations such as the Food and Agricultural Organization of the UN (FAO) have adopted water quality criteria, objectives, guidelines or goals for the animal drinking water constituents listed in Table 1 or have adopted policies to protect animal drinking water supplies.

*Identify Contact List* – In conjunction with the Technical Work Group, the consultant will identify a list of countries and organizations to contact. This list will consist of countries that are known to be progressive in the protection of source water quality based on the experience of the Work Group and the Consultant.

*Conduct Research and Interviews* – The consultant will conduct internet searches and if needed, interviews with agency staff or specialists in the designated countries and organizations to identify any objectives or criteria that have been adopted for protection of animal drinking water supplies.

*Deliverables* – The consultant will prepare a memorandum summarizing the information obtained in this task; present the results at a CV-SALTS Technical Work Group meeting; respond to Work Group comments on the memorandum; and prepare a final memorandum.

### **Task 6 Conduct a Review of Water Quality Criteria Available in Peer Reviewed Articles**

The objective of this task is to review the peer-reviewed literature to determine if scientific information is available for the constituents listed in Table 1 upon which criteria for animal drinking water quality can be established.

*Conduct an Extensive Literature Search* – The consultant will conduct internet and other database searches for information on water quality impacts to animals from the constituents listed in Table 1. Focus in this task is on peer-reviewed journal articles, other published research and reviews conducted by organizations such as the National Academy of Science.

*Deliverable* – The consultant will prepare a memorandum summarizing the information found in the literature search along with an extensive reference list. The reference list should include all articles reviewed, even those not used or cited in the summary; present the results at a CV-SALTS Technical Work Group meeting; respond to Work Group comments on the memorandum; and prepare a final memorandum.

### **Task 7 Prepare a Complete Reference List of All Documents Considered**

The objective of this task is to prepare for the Basin Plan Administrative Record any and all documents reviewed or considered even when the documents were not used in the final analysis.

**Develop an Exhaustive Reference List** – The consultant will develop an extensive reference list of any and all documents used in this review even when the documents were not used in the final analysis.

**Deliverables** – The consultant will prepare a list of all references considered or reviewed. The list will be prepared in a format used for scientific articles and include the author (s), article title, cited source or location of the article, publication date and other information that would enable a reviewer to locate the document in a scientific journal, library or internet site. The consultant will make available copies of all documents reviewed during the course of this study in the order that they are shown in the reference list.

### **Task 8 Develop a Range of Potential Water Quality Goals and Policies**

The objective of this task is to analyze the information obtained in Tasks 1 through 6 to develop a range of water quality criteria that are potentially applicable to the Central Valley. This task will be defined in more detail after completion of Tasks 1 through 6 but will likely include development of a range of potential water quality criteria and their relevance to the Central Valley for each of the constituents listed in Table 1.

### **Schedule**

Tasks 1 through 7 are to be completed within three months of the date of authorization to proceed. The Consultant should provide a schedule showing completion dates for each task. The schedule should take into consideration that the CV-SALTS Technical Work Group meets monthly and will require two weeks for review of Consultant draft submittals. The schedule for completion of Task 8 will be determined in conjunction with the CV-SALTS Technical Work Group.

### **Funding Needed (estimated)**

**Task 1: \$2,000**

**Task 2: \$2,000**

**Task 3: \$3,000**

**Task 4: \$3,000**

**Task 5: \$5,000**

**Task 6: \$9,000**

**Task 7: \$2,000**

**Task 8: \$3,000**

**Total: \$29,000**

DRAFT