

**A CVSALTS Subcommittee Discussion
of Knowledge Gained through the
Salt and Nitrate Sources Pilot Implementation Study
and a
Report Back to the CVSALTS Technical Advisory
Committee
July 2010**

Deleted: Lessons Learned

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DRAFT VERSION 6
**DRAFT VERSION 6B Revised by Daniel Cozad and Lisa Holm
with comments from Joe DiGiorgio and John Dickey
-further revised significantly by Lisa Holm and Joe DiGiorgio**

ADD A GRAPHIC FOR THE COVER

Table of Contents

A CVSALTS Subcommittee Discussion	1
Salt and Nitrate Sources Pilot Implementation Study.....	1
and a	1
Report Back to the CVSALTS Technical Advisory Committee.....	1
Table of Contents.....	0
1 CV-SALTS	1
2 Background	1
3 Arrangement.....	1
4 Objectives	2
5 Process.....	2
5.1 Scope of Work	2
5.2 Contracting.....	2
5.3 CV-SALTS Committee Management of Projects	3
5.4 Outreach	3
6 Technical	4
6.1 Approach.....	4
6.2 Identification of Critical Data	4
6.3 Data Collection Priorities	5
6.4 Assumptions.....	5
6.5 Reported Conclusions	5
6.6 Specific Concerns	6
6.7 Regional Summaries.....	6
6.8 Broader Applicability/Transferability.....	6
6.9 Peer Review.....	6
6.10 Next Steps.....	6
7 Policy.....	6
7.1 Questions Raised (from original report outline, perhaps as a way to jog some new thoughts to add to Policy section).....	6
8 References	6
9 Appendices	7
9.1 Appendix A – Comments and Responses on the Draft Report.....	7
10 Subcommittee Notes	8
10.1 Lessons Learned Subcommittee members	8
10.2 Overview and General Discussion Items.....	8
10.3 Cost and Duration Implications for Rest of the Central Valley	8
10.4 Three Levels of Detail to the Scope of Information for Regions.....	9
10.5 Development of a Conceptual Model of Assessment.....	9
10.5.1 Higher Level of Complexity and Impact.....	9
10.5.2 Highest Level Complexity and Impact (Subcommittee Work Assignment).....	9

1 CV-SALTS

In 2006, the Central Valley Water Board, the State Water Board, and stakeholders began a joint effort to address salinity and nitrate problems in California's Central Valley and adopt long-term solutions that will lead to enhanced water quality and economic sustainability. Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a collaborative basin planning effort aimed at developing and implementing a comprehensive salinity and nitrate management program. In July 2008, the Central Valley Salinity Coalition (CVSC) was formed. CVSC represents stakeholder groups working with the Board in the CV-SALTS effort. The CV-SALTS effort is managed through appointed-membership voluntary committees, primarily the Executive Committee and the Technical Advisory Committee. The Technical Advisory Committee solicited volunteers to form subcommittees to manage three steps of the Salt and Nitrate Sources Pilot Implementation Study report: development of the scope of work, selection of a consultant, and analysis of the final report in the context of informing future steps of the salt and nitrate management planning process.

2 Background

The Technical Advisory Committee (TAC) of CV-SALTS contracted for the Salt and Nitrate Sources Pilot Implementation Study (SNPS) to help assess the potential for rapid implementation of data collection and analysis methods for salt and nitrate mass loadings in representative (diverse) areas the Central Valley, and to help identify issues that may generally apply in other areas of the Central Valley. The SNPS scope was developed by a subcommittee of the TAC, then reviewed and approved by the CV-SALTS TAC, Executive Committee, and Central Valley Salinity Coalition (CVSC). CVSC received eight proposals and a selection subcommittee was established to review the proposals and recommend a consultant to CVSC. The selection committee chose to recommend a consultant whose proposal went slightly beyond the original scope of work to provide quantitative modeling, using significant amounts of data that had already been collected (Larry Walker and Associates and its subcontractors).

At the beginning of the SNPS, CV-SALTS stakeholders participated in the selection of three pilot areas - Yolo County, Modesto area and the Tule River area - based on a combination of selection criteria specified in the Request for Proposals and additional criteria identified in the winning proposal. The contractor developed a work plan to outline the approach, tools, and expected product, which was reviewed and approved by the CV-SALTS TAC and Executive Committee. The work itself was completed in seven months and is described in the Salt and Nitrate Sources Pilot Implementation Study Report. The consultants made periodic reports to the Technical Committee and Executive Committee on their progress. A draft report was submitted in late December 2009 for committee review. **XXX comments received, nature of comments, and how addressed...(list of unanswered questions at end of this document)**. Stakeholder Comments on the Draft Report are shown in Appendix A. A final report was submitted in February 2010.

3 Arrangement

This report documents the discussion of the subcommittee regarding the analysis of the final report in the context of informing future steps of the salt and nitrate management planning process. This report was repaired to inform the broader TAC and to highlight needed technical and policy decisions. The results of these discussions are arranged into the fairly broad topic areas of process, technical and policy. The objectives of this exercise, lists of the participants, and

broader framing guidelines for future work are also included. A separate document was prepared by the subcommittee that summarizes its specific recommendations for moving forward in the planning process.

4 Objectives

The objectives of this document, and the subcommittee who volunteered to develop it, is to review the SNPS and determine how it informs the CV-SALTS process. In some respects, the SNPS provides technical direction on how CV-SALTS should develop the technical documentation to support basin-wide salt and nitrate planning. On the other hand, the process of developing the SNPS and the report itself also affords CV-SALTS an opportunity to improve some processes, better define the technical documentation it needs, and elucidate some critical policy questions that require resolution.

The stated purpose of the SNPS was to develop and test a methodology for examining salt sources within a region (perhaps by watershed), as a test case for developing uniform methodology for the development of this information for all regions within the Central Valley. However, the SNPS also served to inform CV-SALTS as to whether this information would be enough to fully inform salinity and nitrate management planning.

5 Process

CV-SALTS and the CVSC are exploring new arrangements and institutions for managing, funding, and contracting for technical work in support of a Basin Plan Amendment and associated salinity and nitrate management plan(s). In this respect, it is valuable to examine the process that was employed in this first contracting exercise and the value of the experience and product that resulted. The process examination and recommendations are divided into process stages. The following recommendations are intended to improve the CV-SALTS process for contracting out work.

5.1 Scope of Work

- a) Spelling out Expectations: CV-SALTS subcommittees' development of Scopes of Work should include discussions on the expected format and intended uses for all deliverables of the project, and spell them out in the scope of work. This both helps CV-SALTS to focus on what it is looking for and how it fits with other products, and helps to direct constructive criticism towards the substantive portions of finished the products as opposed to the scope and format.
- b) Peer Review: CV-SALTS should discuss whether it is appropriate to include peer review requirements within a task scope of work, or whether separate budget should be identified to perform peer reviews. CV-SALTS should consider reviewing its list of expected deliverables (from the work plan) and determine the importance of accompanying peer reviews. If peer review is to become an embedded process, CV-SALTS should develop general scope and expectations of peer review processes.
- c) Work Plan: Once a scope of work is finalized, CV-SALTS should reintegrate the scope into the CV-SALTS work plan, and review the work plan to see if additional adaptations are warranted.

5.2 Contracting

- a) Contracting Schedule: The contracting schedule should more accurately consider the amount of time needed by volunteers to review proposals, to schedule meetings (discussion of proposals,

interview of candidate firms), and for the CVSC to consider and approve. This would be a more practical approach than just trying to do a better job of sticking to unrealistic schedules.

b) Allocate project funding ahead of time to facilitate timely payment of contractors

c) Schedule should proceed as quickly as possible without affecting quality

5.3 CV-SALTS Committee Management of Projects

- a) Communication: Currently, consultants have no guidelines or established expectations for their presentations to CV-SALTS. Most organizations have project managers who work with consultants during presentation development to advise on audience expectations and to review presentations for tight communication of key points. Because CV-SALTS attendance is uneven, consultants also struggle with the issue of repeating previous information, or building on previous information which leads to long presentations with little new information or where key points become lost. CV-SALTS should consider either developing standard presentation expectations or consider soliciting a volunteer to work with the consultant on presentations. This should result in greater efficiencies on both sides. For executive committee presentations, this same volunteer could represent the TAC and present part of the presentation as a presentation from the TAC (on the decision points, recommendation, and key issues).
- b) Project Reviewers: There was no pre-established review panel or process for the SNPS. Thus, the review was completed by interested parties according to their own schedules and priorities. This approach left the TAC unable to address key questions from some members (such as “What do we want out of this?”) and unable to efficiently guide the production of a final draft. For each project, CV-SALTS should establish the project review process up front. Also, this particular work is representative of three geographic areas and it is possible that this work will be portrayed as accurately representative of those three areas in the salt and nitrate management planning effort. However, CV-SALTS made no specific process accommodation for outreach to or engagement of representatives of those geographic areas. CV-SALTS should discuss the question of what level of effort it will commit to local engagement in technical information development, and what resulting local support of the ultimate plan it expects to gain.
- c) Role of RWQCB: CV-SALTS is a stakeholder effort convened by the RWQCB. The SNPS had a great deal of local data to collect, and recommended that in the future the RWQCB appoint a person to assist with outreach for data collection, to add weight to requests. The RWQCB also has the ability to issue formal data requests. The role of the RWQCB should be explicitly considered and described in future Scopes of Work that include data collection.

Comment [d1]: Do you mean for a particular work task consultant working on a particular task, or more general ...ie someone to screen all presentations? I think this point is valid for both cases.

Comment [BOR2]: I think for each project we could develop a management subcommittee, whose members could take turns (or the entire subcommittee could do this) in advising consultants as to the key communication points and appropriate level of detail.

Comment [d3]: Are we ready to conclude from the pilot study that the regional board should begin issuing formal data requests of certain agencies...with particular format and content??? If so what??

Comment [BOR4]: I have no specific ideas, but I do think this is a route that we should discuss.

5.4 Outreach

- a) Local government: CV-SALTS must determine the role of local governments in the development of regional information upon which the salinity and nitrate management plan will be based. Outreach to local government under the SNPS was primarily conducted by the consultant for the express purpose of collecting specific data. This misses an opportunity to educate local governments on the purpose of CV-SALTS. CV-SALTS outreach to local government could be done on a case by case basis as regional information is developed, or it could be done through a broad mailing/emailing to inform local governments of key developments during the planning process, accompanied by invitations to participate in CV-SALTS. As the cost and scope of developing this information is better defined, CV-SALTS should also discuss whether it should pursue a matching grant program to encourage local entities to lead the development of regional information.

- b) Local stakeholders: Stakeholders in the area should be noticed formally, potentially by the Regional and State Boards as part of the process whether initiated by CV-SALTS or by an independent regional group. This could facilitate broader understanding of, engagement in, and support of the salinity and nitrate management planning process.

6 Technical

The reviewing subcommittee analyzed the SNPS for technical “Lessons Learned” in the context of the broader CV-SALTS goals to highlight specific technical issues and to document conclusions that are supported by the effort.

6.1 Approach

The selection of this particular project approach – quantification through detailed data and modeling - immediately raised additional issues that, now that the process is complete, warrant review and discussion.

- a) Scale/Level of Detail: CV-SALTS selected an approach that was very detailed and based on scales set by previous modeling efforts. Therefore, this is an opportunity to evaluate, with a real example, whether this is the appropriate scale and the appropriate level of detail for the CV-SALTS effort. The CV-SALTS TAC should establish a team to evaluate this question. The SNPS based its scale and level of detail on models and data that were essentially readily available. This will not be the case in every region throughout the Central Valley. It is recommended that the CV-SALTS TAC team use the detailed information in the SNPS report to determine how a) a region should be defined and b) what minimum/critical level of detail is needed to support the (integrated) basin planning effort. The subcommittee

6.2 Identification of Critical Data

- a) Focus on Beneficial Use Objectives: The SNPS was not scoped to include consideration of beneficial uses or established water quality objectives. The goal of CV-SALTS is ultimately a management framework that achieves compliance with concentration based objectives set to protect beneficial uses. These objectives vary by constituent, beneficial use being protected, type of permitted discharge, and in some cases are relative to the quality of the water source. Identifying established or potential objectives for surface and ground waters would help to focus future studies on the fundamental objectives of salt and nutrient planning that are not apparent by quantifying sources alone.
- b) Definition/Prioritization of Critical Elements: The SNPS evaluated all sources and sinks that are included in the WARMF model. Presumably, the EPA considered all potential sources when it originally developed the model. However, from a practical standpoint, sources will vary in their degree of manageability. Given more funding, the SNPS suggests that sensitivity analyses could be used to determine how sensitive the outputs are to the input variables. CV-SALTS should determine whether it wishes to focus on accurate quantification of all sources of salts/nitrates, or whether it wishes to focus on controllable sources of salts/nitrates and shift non-controllable sources into a generic “background” category. Then, the SNPS could also be evaluated to determine if there are critical data that is needed for every region or if CV-SALTS should fund some additional sensitivity studies for the existing model studies. Prioritization of sources and sensitivity studies can also inform the need for improving accuracy of data.

Also, regions will likely want to develop a prioritization exercise in order to inform management strategies. It may also be possible to use the extensive land cover tables in the SNPS, with associated loading rates, and conduct a literature search to determine to

what degree sources are known to be controllable and associated costs, and develop a suggested basin-wide prioritization of control activities.

c) **Importance of Shallow Groundwater:**

Comment [d5]: Is this for CV_SALTS to attempt or just leave to local group???

6.3 Data Collection Priorities

6.4 Assumptions

- a) Time Period: The SNPS evaluated a particular ten-year (average) of salt and nitrate sources and sinks. Knowledge of the basis for certain water quality objectives would help to identify the appropriate averaging scale for salt and nitrate evaluations, which would then help focus regulation, measurement, and management on appropriate time scales.

Comment [BOR6]: A point Lisa hasn't verified yet. I've highlighted a lot of things when I write in order to go back and research/verify. Just FYI.

6.5 Reported Conclusions

- a) Findings of SNPS: The findings of the SNPS reflect the approach of the SNPS, the use of broad loading categories to define sources. However, finding that "irrigation water" and "fertilizer/land use" are major sources of load masks the relative effects that different uses of these "loadings" produce from a receiving water concentration perspective. Also, broad categories such as these do not add any particular value when identifying and prioritizing solutions, although they do reinforce conclusions that certain uses must be controlled to ensure any level of success.
- b) Focus of SNPS Recommendations: The focus of the reported conclusions and recommendations are more focused on improving the modeling tools then on answering the fundamental questions of CV-SALTS. The key sentence of the SNPS is that "None of these recommended actions would likely impact the basic results or conclusions derived from this study." It is unclear whether any of these recommendations are based on a prioritization of controllable salts or nitrates, prioritization of the accuracy of the analysis, or sensitivity analysis. This subcommittee finds that CV-SALTS should consider and discuss other suggestions in this report in order to formulate what the CV-SALTS "product" should look like, before using the same approach and methodology in other regions, or before pursuing any of the suggestions in the SNPS. These suggestions should be considered by any regions that independently pursue a similar study, however.
- c) Format of Results: In addition to defining expectations as to regions and level of details, CV-SALTS should also evaluate how data should be compiled into a graphic or data table that will be appropriately representative of a region, and form a digestible communication tool. In order to do this, CV-SALTS should consider starting with the outcomes it hopes to achieve, and a sense of how regional evaluations will be integrated. For example, SNPS presents pie charts to compare the three regions salt loads, but these pie charts do not represent the same total volume, thus they are not comparable.
- d) Completeness of Results: The SNPS was envisioned as a salt sources study. This was then translated into a load analysis. Straight load analyses hide the role of water volume, and thus make it impossible to compare results on the variable that is meaningful to meeting objectives: concentration. With a straight load analysis alone, it is difficult to compare regional results and, unless the water volumes remain fixed, impossible to develop or regulate to concentration based WQOs. . The SNPS cannot be faulted for this, but CV-SALTS should consider developing information that includes all critical factors relative to concentration based salinity and nitrate management.

Comment [d7]: It can reinforce the conclusion that certain uses **must** be controlled or mitigated if management is to be ultimately successful.....that would take quantification of the amount of management needed to achieve a particular WQO though.

6.6 *Specific Concerns*

Atmospheric Deposition data.

6.7 *Regional Summaries*

- b) Integration of Regions: Regions are linked naturally by surface and ground waters, artificially through infrastructure. If CV-SALTS continues to pursue a region-by-region approach it will need to immediately define how it expects to link regions together, most likely through describing how linking elements must be analyzed and how CV-SALTS will then fit them all together. This will become critically important to inform regulation strategies such as allocation of responsibilities throughout a river and its tributaries.

6.8 *Broader Applicability/Transferability*

- a) Develop Guidelines: Based on the SNPS and these “Lessons Learned”, this CV-SALTS subcommittee recommends that guidelines or a framework be developed to guide future work. The SNPS, aside from being informative for what it contains, is also informative as to what it does not contain. This subcommittee has developed an initial list of what it believes a regional technical salt and nitrate evaluation should contain. The SNPS can also be reviewed to determine where assumptions are universally applicable and should be adopted throughout the basin.

6.9 *Peer Review*

6.10 *Next Steps*

7 Policy

7.1 *Questions Raised (from original report outline, perhaps as a way to jog some new thoughts to add to Policy section)*

The stakeholder reviewers and Executive Committee identified the following process and policy issues based on the results of the SNPS.

1. What level of knowledge, data and certainty is needed for the development of a CV wide conceptual model that can be characterized as “accurate”
2. A framework for integration is needed for both policy and data
3. What is the date range of years where data is needed for “current” and for “pre-regulation”
4. Who can or should be responsible for salts and nitrates discharged or mobilized before regulation of salt and nitrate?
- 5.

8 References

1. Larry Walker Associates, under contract to Central Valley Salinity Coalition for CV-SALTS “Salt and Nitrate Source Pilot Implementation Study Report and Work Plan” February, 2010 available at http://intpln.com/Docs/Final_SNSPIS_Report_Submittal_02.22.10_rs.pdf Accessed 3/25/10

2. Central Valley Regional Water Quality Control Board
"Salinity in the Central Valley, an Overview" May 2006
Report Available at
http://www.waterboards.ca.gov/centralvalley/water_issues/salinity/initial_development/swrcb-02may06-ovrvw-rpt.pdf Accessed 2/29/08
3. University of California, Davis, Agricultural and Resource Economics
"Economic and Social Impact of Salinity in the Central Valley" (Draft) Dr. Richard Howitt,
April 2008
4. Department of Water Resources Division of Planning, **California's Groundwater: Bulletin 118**, 2003,
Available at <http://www.groundwater.water.ca.gov/bulletin118/> Accessed 2/29/08

9 Appendices

9.1 Appendix A – Comments and Responses on the Draft Report

10 Subcommittee Notes

10.1 Lessons Learned Subcommittee members

Technical Committee Subcommittees

Salt and Nitrate Source Pilot Implementation Study Lessons Learned Report

- Lisa Holm
- Robert Smith
- Mona Shulman
- Michael Nordstrom
- Nigel Quinn
- David Cory
- Joe DiGiorgio
- Rudy Schnagl
- John Dickey
- Linda Dorn
- Daniel Cozad

10.2 Overview and General Discussion Items

1. What do we need to know, where do we need to know it and what is the level of detail/accuracy needed?
2. Can a lower level of information on impact and complexity be used to complete triage?
3. What do regions need to do for and from CV-SALTS to plan for salinity and nitrate?
4. How do we integrate the pilot and other areas into the overall characterization of CV
5. How is #4 above harnessed for salt management for the CV?
6. Need for synthesis of data in the report
7. Need to determine a measure of [certainty] how sure are you that you are right
8. Identify problems and develop the information to fill the problems we are trying to manage
9. Need information to support regulatory and non-regulatory efforts including triggers and necessary commitment from areas.

Comment [JBD8]: By defining WQO's so ass cap and excess salt can be assessed and management/itigation can be quantified and monitored.

10.3 Cost and Duration Implications for Rest of the Central Valley

What can we say we learned about the cost and time needed for the "pilot level" scope of work for the rest of the Central Valley.

The pilot implementation study covered about 10% area coverage, cost approximately \$500K and took about 8 months. The Pilot areas were selected because they had considerable data and complexity. The other areas of the region may not be as complex or have as much data. That said, the assumptions will need more documentation.

Comment [JBD9]: Less cost??

Comment [JBD10]: More cost??

Study	Area Covered	Population	Cost	Duration
3 pilots	9% of CV	13% of CV	\$500,000	8 months
Rest of CV		87%	\$3,846,154	16 months
Rest of CV	91%		\$5,555,556	20 months
Average Cost			\$4,700,855	18 months

Comment [JBD11]: This needs to be jacked to complete study

Comment [JBD12]: ditto

10.4 Three Levels of Detail to the Scope of Information for Regions

- Conceptual for Triage
- What does an area need to provide to CV-SALTS to demonstrate an area has or is capable of managing salts and nitrates
- What would CV-SALTS need to develop a conservative “default” management plan for the region and
- What level of efforts would be required to revise and get it accepted in a new basin plan amendment?

Comment [JBD13]: agreement on appropriate WQO and affect of land covers.....mitigation plan.....funding source to implement mitigation plan

10.5 Development of a Conceptual Model of Assessment

The committee attempted to develop a model for the level of information needed for assessment shown below.

10.5.1 Higher Level of Complexity and Impact

What level of detail is needed between the low and highest levels of impact and complexity?
How many levels are needed?

Comment [JBD14]: If conservative assumptions serve as default values then individual area make as complex as needed to adequately characterize.

10.5.2 Highest Level Complexity and Impact (Subcommittee Work Assignment)

Committee members are to propose the level of information and verification needed for the CV-SALTS proves for Highest Tier areas.

Comment [JBD15]: Timeline, sequestering/ mitigation plans monitoring plan.....financial liabilities covered in case of default???

Highest Level Complexity and Salt Impact