STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING SESSION – CENTRAL VALLEY WATER BOARD
January 21, 2014

SUBJECT

CENTRAL VALLEY SALINITY ALTERNATIVES FOR LONG-TERM SUSTAINABILITY (CV-SALTS): ANNUAL PROGRESS REPORT

BACKGROUND

CV-SALTS is a stakeholder lead initiative developing a Central Valley-wide salt and nitrate management plan. Cleanup and Abatement (CAA) funds were authorized in two separate resolutions to provide seed money for the initiative. Resolution No. 2009-0023 authorized $1.2-million and Resolution No. 2010-0042 authorized $3.8-million. The $3.8-million was allocated in two phases with $2.0-million available upon adoption of the resolution and the final $1.8-million authorized in December 2012. To track progress, Resolution No. 2010-0042 included a requirement that the Central Valley Water Board report annual progress on the initiative at a publicly noticed State Water Board meeting. The progress report is to include a detailed accounting of expenditures, services received, a line item report of in-kind and contract services contributions from Central Valley Salinity Coalition (CVSC) members and/or additional public and private entities, a summary of work accomplishments to date and timeline for completion of work.

Details of the required information are included in the attached staff report. A brief summary is provided.

Expenditures and Cost Share: Since 2008, total expenditures related to development of a Salt and Nitrate Management Plan (SNMP) for the CV-SALTS initiative are $15,932,476. Of this total, $2,285,436 (14%) has been provided from the authorized CAA funds, while $13,647,040 (86%) has been expended by CV-SALTS Stakeholders, which include CVSC members, other organizations, and agencies. As of September 2013, $971,650 of the CAA funding provided through Resolution No. 2009-003 and $1,313,789 of the funding provided through Resolution No. 2010-0042 had been expended. Workplan elements totaling an additional $1,777,431 are in progress.

CVSC members have provided over $1,318,145 in cash contributions through membership fees. CVSC members and other stakeholders have also provided $1,291,744 in direct match for workplan items and $11,037,151 for efforts related to the work plan such as basin planning efforts, monitoring activities and pilot studies that provide foundational support for the development of a final SNMP. In addition, CVSC members and other organizations have initiated implementation activities for salinity and nitrate reduction. A sampling of these efforts combined with workplan related activities, identified projects totaling over $55 million. The projects are being evaluated as the implementation program is developed.

Services Provided: The amounts listed above do not account for the time spent by stakeholders to participate on policy and technical committees that identify tasks, scope the work, conduct and oversee work, and review and approve final products (approximately monthly policy meetings and two meetings per month for various technical subcommittees). Stakeholder produced products are discussed under accomplishments. In addition, stakeholders provided services for program

management, meeting and website management and cost-shared a number of the contracted items listed below. Contracted services include a Technical Project Management team that provides Basin Plan and technical and facilitation support to assist with the accomplishments listed below.

Accomplishments to Date:

Stakeholder Driven:

- ✓ Pilot salt source identification/ interaction studies covering 14% of the Central Valley;
  - o Evaluation of completeness of the three studies conducted in the Sacramento, San Joaquin, and Tulare Basins;
- ✓ Preliminary framework for standardizing future salt source studies;
- ✓ February 2011 Leadership Team meeting to review progress;
- ✓ Interim and Subsequent Salinity Project Funding Plan;
- ✓ Pilot studies for desalinization and containment alternatives;
- ✓ Screening mechanism for management practices in order to develop a validated "toolbox" to support industry in reducing salt and nitrate impacts;
- ✓ Technical recommendations regarding use of modeling tools to develop site specific salinity objectives to protect irrigated agriculture;
- ✓ Technical review of salinity and nitrate water quality criteria and recommendations to protect stock watering;
- ✓ June 2012 and December 2013 Central Valley Water Board Workshops;
- ✓ Co-sponsor of and participant in the Groundwater Resources Association Salinity and Nitrate Conference in Fresno (June 2012);
- ✓ Drafted revised Chapter 18 (Salt and Salinity Management) for the California Water Plan; and;
- ✓ Policy recommendations related to:
  - o Application of Secondary MCLs to protect MUN beneficial uses;
  - o Conceptual regulatory framework for protection of AGR beneficial uses;
  - o Principles for calculating background water quality and assimilative capacity; and,
  - o Management zone concept and alternative compliance strategies;
- ✓ Coordination, oversight and cost share of case studies and technical projects identified below.

Contract Supported:

- ✓ Updated 2012 Strategic Plan, Framework and Workplan
- ✓ Salinity water quality criteria review for aquatic life;
- ✓ White paper on salinity and nitrate impacts on municipal and domestic supply;
- ✓ White paper on salinity impacts on irrigated agriculture;
- ✓ GIS database and beneficial use maps for the Central Valley and Delta (coordinated with State Water Board effort);
- ✓ Initial salinity/nitrate conceptual model (ICM)--data compilation; source/fate; initial background and trend analysis for 22 analyses zones;
- ✓ Phase 1 Strategic Salt Accumulation Land and Transport Study (SSALTS) evaluation of salt disposal options;
- ✓ Central Valley Salinity brochure;
- ✓ Improved functionality of the CV-SALTS website; and,
- ✓ Support for Regional Board CEQA Scoping meetings in Modesto, Rancho Cordova, Colusa and Fresno.

In Progress:

- ✓ Management zone based evaluation of appropriate salinity water quality objectives to protect irrigated agriculture;
- ✓ Phase II Conceptual Model: refine calculations for background, assimilative capacity and trend; focused management zone study;
- ✓ SSALTS Phase 2: Development of alternatives for in-valley, out-of-valley, and combination salt management strategies; and,
- ✓ Case studies to ground-truth policy and implementation recommendations (in progress):
    - o Appropriate application and protection of municipal and domestic supply in agriculturally dominated surface water bodies (Publicly Owned Treatment Works receiving waters in the Sacramento River Basin);
    - o Appropriate application and protection of municipal and domestic supply in a portion of the unconfined aquifer within the Tulare Lake Bed;
    - o Lower San Joaquin River salinity and boron water quality objectives and implementation program.

Timeline for Completion of Work: The timeline for completion of a draft Central Valley Salt and Nutrient Management Plan was extended by Resolution 2013-0149 of the Central Valley Regional Water Quality Control Board to May 14, 2016 based on demonstration of substantial progress made by CV-SALTS and the need for additional time to insure thorough environmental and economic review of proposed alternatives before submitting a final plan. This two year time extension is consistent with requirements of the State Water Board's Recycled Water Policy.

DISCUSSION

Summaries of the expenditures and accomplishments to date as well as future activities and timelines will be presented.

POLICY ISSUE

None

FISCAL IMPACT

None

ENVIRONMENTAL IMPACT

None

REGIONAL BOARD IMPACT

None

STAFF RECOMMENDATION

None

This information item assists the Water Boards in reaching Goal 5 of the Strategic Plan Update: 2008-2012 to improve transparency and accountability.

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STAFF REPORT
CV-SALTS ANNUAL PROGRESS REPORT—JANUARY 2014

The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) initiative is a stakeholder-led process to develop a Salt and Nitrate Management Plan (SNMP) for the Central Valley and basin plan amendment recommendations to support implementation of the SNMP. The initiative was formally recognized under a signed Memorandum of Agreement between the State Water Board, Central Valley Water Board and Central Valley Salinity Coalition (non-profit stakeholder group) in March 2010. Several committees and subcommittees have been formed to work on both policy and technical issues with meetings held on a monthly basis. The Executive Committee is the primary decision making body and is comprised of members of the stakeholder coalition as well as state and federal agencies and members of disadvantaged communities and the public.

On September 7, 2010, the State Water Resources Control Board approved Resolution No. 2010-0042 authorizing $3.8-million from the Cleanup and Abatement Account (CAA) to augment funding for the development of the Central Valley Salinity and Nitrate Management Plan (SNMP or Project). The funding augments $1.2-million provided through Resolution No. 2009-0023.

Resolution No. 2010-0042, allocated the $3.8-million in two phases with $2.0-million available upon adoption of the resolution and $1.8-million approved by the State Water Board in December 2012. To track progress, the resolution included a requirement that the Central Valley Water Board report annual progress on the initiative at a publicly noticed State Water Board meeting. The progress report is to include a detailed accounting of expenditures, services received, a line item report of in-kind and contract services contributions from Central Valley Salinity Coalition (CVSC) members and/or additional public and private entities, a summary of work accomplishments to date and timeline for completion of work. The following document provides the required information. Expanded discussion of the project is provided at annual Central Valley Water Board workshops.

Expenditures for Services and Contributions from Stakeholders

Table 1 provides a detailed accounting of the expenditures for services received utilizing Clean-up and Abatement (CAA) funds. Table 2 summarizes the Stakeholder Contributions, both those directly supporting workplan tasks identified in Table 1 as well as additional efforts related to the workplan such as basin planning efforts, monitoring activities and pilot studies that provide foundational support for the development of a final SNMP. Tables 1 and 2 track funding and expenditures from July 2008, which is when the CVSC formed.

Table 3 and Figure 1 summarize the cumulative available funding, encumbered funding (funding allocated to specific tasks), and actual expenditures by year that are related to developing the final SNMP. Based on the summary information, total expenditures for the CV-SALTS initiative since July 2008, were $15,932,476. Of this total, $2,285,436 (14%) has been provided from the authorized CAA funds, while $13,647,040 (86%) has been expended by CV-SALTS Stakeholders, which include CVSC members, other organizations, and agencies. As of September 2013, $971,650 of the CAA funding provided through Resolution No. 2009-003 and $1,313,789 of the funding provided

through Resolution No. 2010-0042 had been expended. Workplan elements totaling an additional $1,777,431 are in progress with remaining funding slated for fine tuning implementation alternatives and conducting environmental and economic analyses.

Stakeholder cash contributions from CVSC membership fees and a consultant's contribution toward workplan elements total $1,318,145 to date. Additional stakeholder contributions directly supporting workplan elements including additional match for some CAA funded projects, total $1,291,744. Additional contributions related to the workplan include compilation of water quality information ($3,401,777) and pilot studies evaluating treatment alternatives ($7,635,374). Specific activities are listed in Table 2 with additional detail in Table 4.

In addition to these contributions, CVSC members and other organizations have initiated implementation activities for salinity and nitrate reduction, both voluntarily and through current regulation. A sampling of these efforts identified projects totaling over $55 million (Table 4). Table 4 includes detail on several projects and reflects a broad array of activities including: investigating various treatment alternatives for agricultural, urban and industrial drainage and wastewater; supporting basin planning activities; gathering water quality information to feed the decision processes; and implementing on the ground practices to control salt and nitrate. The permit required costs noted in the table (over $7.25-million) include just a sampling of the types of costs faced by dischargers to quantify salt sources, develop salt minimization plans, and monitor/evaluate management practices. Some key efforts identified include the San Joaquin River Real-time Water Quality Monitoring by the CA Department of Water Resources, Wine Institute Practice Manuals, the Representative Monitoring Program by Dairy Cares and Western United Dairymen, and programs for control and management of subsurface agricultural drainage being implemented by Tulare Lake Bed interest and the Grassland Area Farmers. The projects are being evaluated as the implementation program is developed.

Tables 2 and 3 and Figure 1, do not account for the time spent by stakeholders to participate on policy and technical committees that identify tasks, scope work, conduct and oversee work, and review and approve final products (approximately monthly policy and administrative meetings and two meetings per month for various technical committees and subcommittees). A rough estimate of stakeholder participation can be determined by assuming a standard rate of $100/hr. per person. Based on the number of meetings and attendance, between July 2009 and October 2013, CV-SALTS Committee Members contributed more than 11,952 hours participating in Committee and subcommittee meetings supporting CV-SALTS. This participation represents an approximate additional expenditure by the stakeholders of $1,159,200 for the period.

Services provided to date have ranged from coordinating administrative, technical and facilitation support to developing screening tools and technical review and recommendations to completing technical studies. Results of the stakeholder oversight and efforts are listed under stakeholder driven accomplishments below.

Work Accomplishments to Date

CV-SALTS has completed several of the workplan items, is in-progress on many more and has identified a timeline to insure thorough economic and environmental review of proposed alternatives. Four California Environmental Quality Act (CEQA) Scoping meetings were held during October 2013, to solicit comments on potential components

of a Central Valley SNMP. Accomplishments can be summarized by those completed by the stakeholders as committee projects and those completed as contracted elements as follows:

Stakeholder Driven:

- ✓ Pilot salt source identification/interaction studies covering 14% of the Central Valley;
  - o Evaluation of completeness of the three studies conducted in the Sacramento, San Joaquin, and Tulare Basins;
- ✓ Knowledge Gained Subcommittee Guidance for Salt Source Identification Studies
- ✓ Interim and Subsequent Salinity Project Funding Plan
  - o New CVSC Members and forthcoming Expansion Plans
  - o Contributions in Direct and Indirect studies as well as support for CV-SALTS and implementation of projects to control salinity and nitrates (Tables 2 and 4)
- ✓ Management Practices Subcommittee Guidance for Development of a Salt and Nitrate BMP Toolbox;
- ✓ Technical recommendations regarding use of modeling tools to develop site specific salinity objectives to protect irrigated agriculture;
- ✓ Technical review of salinity and nitrate water quality criteria and recommendations to protect stock watering;
- ✓ Technical review of salinity and nitrate issues relating to studies by the City of Dixon, City of Davis, City of Live Oak and others;
- ✓ June 2012 and December 2013 Central Valley Water Board Workshop;
- ✓ Co-sponsor of and participant in the Groundwater Resources Association Salinity and Nitrate June 2012 Conference in Fresno;
- ✓ Draft revised Chapter 18 (Salt and Salinity Management) for the California Water Plan; and,
- ✓ Coordination, oversight and cost share of case studies identified below.

Contract Supported:

- ✓ Update 2012 Strategic Framework and Workplan;
- ✓ Salinity water quality criteria review for aquatic life;
- ✓ Working white paper on salinity and nitrate impacts on municipal and domestic supply (MUN);
- ✓ Working white paper on salinity impacts on irrigated agriculture;
- ✓ GIS database and beneficial use maps for the Central Valley and Delta (coordinated with State Water Board effort)
- ✓ Initial salinity/nitrate conceptual model (ICM) compiled data; source/fate; initial background and trend analysis for 22 analysis zones;
- ✓ Phase 1 of the Strategic Salt Accumulation Land and Transport Study (SSALTS) implementation alternatives study completed;
- ✓ Central Valley Salinity brochure; and,
- ✓ Improved functionality of the CV-SALTS website.

<u>In Progress:</u>

- ✓ Management zone based evaluation of appropriate salinity water quality objectives to protect irrigated agriculture;
- ✓ Phase II Conceptual Model: refine calculations for background, assimilative capacity and trend; focused management zone studies;

- ✓ SSALTS Phase 2: Development of alternatives for in-valley, out-of-valley, and combination salt management strategies; and
- ✓ Case studies to ground-truth policy and implementation recommendations:
    - o Appropriate application and protection of municipal and domestic supply in agriculturally dominated surface water bodies (Publicly Owned Treatment Works receiving waters in the Sacramento River Basin);
    - o Appropriate application and protection of municipal and domestic supply in a portion of the unconfined aquifer within the Tulare Lake Bed;
    - o Lower San Joaquin River salinity and boron water quality objectives and implementation program; and
    - o Planning and coordination for early implementation project to provide safe drinking water for disadvantaged community.

A Summary of Technical Projects Supporting a Central Valley-wide Salt and Nitrate Management Plan is included as Attachment A to provide additional information on the various projects.

Additional discussion of CV-SALTS activities is provided below.

During 2013, the Executive Committee continued working on the technical and policy elements of the workplan. The strategy envisions an overarching framework to provide consistency throughout the Central Valley with case studies conducted to ground-truth policy and technical recommendations. Therefore, significant work was completed to develop the salt and nitrate source and fate Initial Conceptual Model (ICM), enhance the GIS based beneficial use and objectives mapping tool, and accelerate the Strategic Salt Accumulation Land and Transportation Study (SSALTS) that evaluates alternative salt disposal options. In addition, specific case studies are ongoing with contributions from the stakeholders that evaluate: appropriate application and reasonable protection of Municipal and Domestic Supply beneficial uses in surface and ground water (Sacramento Valley POTW receiving waters and Tulare Lake Bed perched groundwater, respectively); appropriate salt and boron water quality objectives to protect beneficial uses and implementation alternatives (the Lower San Joaquin River); and development of appropriate salinity water quality objectives to protect agricultural supply beneficial uses within broad management zones throughout the Central Valley.

As the technical efforts and case studies proceeded, the Executive Committee continued focused policy discussions in several areas. Listed below are completed and ongoing policy issues:

<u>Completed</u>

- ✓ Application of Secondary MCLs to protect MUN
- ✓ Conceptual regulatory framework for protection of AGR
- ✓ Initial principals for calculating background water quality and assimilative capacity
- ✓ Management Zone Concept
- ✓ Potential alternative compliance strategies
- ✓ Description of existing regulations and policies that determine salt and nitrate management—benefits and limitations

Ongoing

- Further delineation of surface water bodies and/or groundwater basins to increase regulatory flexibility and facilitate management zone implementation
- Decision tree for interpreting narrative AGR water quality objective
- Surface water and groundwater distinctions related to protection of AGR
- Appropriate application of Sources of Drinking Water Policy (88-63)
- Water recycling and stormwater recharge/use goals and objectives
- Maximum benefit guidance
- Drought considerations

The group continues to closely coordinate with work being conducted by stakeholders in the Tulare Lake Basin to identify safe drinking water pilot projects.

The first of annual Central Valley Water Board workshops on the initiative was conducted in June 2012, with discussion of state resources spent to date, match contribution by participating stakeholders, products produced, updated project timeline and focus on the developing case studies and how they fit into the broader valley-wide framework. The Central Valley Water Board heard an informational item on policy discussions in July 2013, and held another workshop in December 2013, to receive an update on CV-SALTS and consider approval of a resolution to extend the end date of the project by two years.

The various committees completed additional key tasks as noted below.

Members of the Executive Committee participated in the development and provided presentations for the Groundwater Resources Association Salt and Nitrate Conference held in Fresno in June 2012. CVSC presented at the Biannual Groundwater Resources Association meeting in Sacramento in October 2013.

The Lower San Joaquin River (LSJR) Committee hired a committee manager; entered into a contract with East Stanislaus Resource Conservation District for technical contracting services, updated its project workplan, drafted language for a problem statement, basin background and beneficial use evaluation; entered into negotiations with the Department of Water Resources and U.S. Bureau of Reclamation for in kind support of water quality data compilation, modeling and outreach; and initiated development of a Scope of Work for additional technical needs such as the evaluation of alternatives and development of the Substitute Environmental Document for the project. A separate Basin Plan Amendment proposing salt and boron water quality objectives and an implementation program for the LSJR is anticipated in 2015, based on the current committee timeline.

The Technical Committee continued to provide technical recommendations to the Central Valley Water Board NPDES and WDR Program Managers on the use of various models (e.g. Hoffman and Grattan) to calculate site specific electrical conductivity objectives for the protection of irrigated agriculture, based on reviews of the cities of Dixon, Live Oak, Roseville, Manteca, Colusa and Vacaville. The recommendations included default leaching fractions and comparison of key model inputs. The committee also highlighted and deferred to the Executive Committee key policy recommendations including:

- Reasonable yield protections;
- Special considerations during seasons or under drought conditions;
- Selection of most sensitive crop within an area; and
- Role of management and grower input in determining appropriate objectives.

The Technical Committee oversaw projects evaluating current salinity criteria utilized to protect stock watering, current criteria to protect aquatic life, and the majority of the projects listed in Attachment A.

The Funding and Fundraising Committee continued work on its two phase plan for fundraising. Phase 1 continues the addition of members to the CVSC to support ongoing planning efforts and the development of matching funding for the planning efforts. During 2013, two new members joined bringing the total membership to 28, covering most of the irrigated agriculture within the Central Valley in addition to representatives for most of the urban areas, food processors, and dairy industry, with some representation from water supply entities and other industry. In addition to new members, CVSC also received more than $60,000 in project specific contributions. CVSC members also agreed to significantly increase their annual dues to support the critical project being undertaken in CV-SALTS.

Phase 2 of the funding plan, targets grant support of salinity management and nitrate projects, which has resulted in USDA funding of a specialty crop grant for nitrogen management. Although current efforts have focused on funding within existing programs, the group continues to evaluate opportunities to develop new funding programs for salt and nitrate management. Support for CVSC Members and CV-SALTS participants in securing grants from existing programs at the State and federal levels will continue as will efforts to engage the help of legislators and agencies to develop new funding sources for the implementation plan that will be required for CV-SALTS. CVSC has groups engaged in discussions related to funding at all levels.

Based on recommendations from the Education and Outreach subcommittee, funding was directed to develop a brochure on salinity impacts on the Central Valley. The Brochure is available at: http://cvsalinity.org/index.php/document-listing/doc_download/984-salt-story-brochure.

The main CV-SALTS webpage was updated to clarify content and improve usability. The site is located at: http://cvsalinity.org

To support and provide consistency for the stakeholder driven effort, the Executive Committee hired full-time program coordinators. An Administrative Program Coordinator was hired in January 2011, to facilitate policy meetings, update the existing workplan and initiate contracts for the needed technical work. A Technical Project Manager was hired in September 2011 and replaced in August 2012, to insure technical information needed to support the initiative and a final basin plan amendment are completed on time and on budget.

Timeline for Completion of Work

In early 2012, the Executive Committee updated the existing scope and timeline of the project so that the updated workplan better reflects resource and time constraints. The

development of a draft Central Valley Salt and Nitrate Management Plan for review by the Central Valley Water Board was slated for May 2014, with ultimate project completion in May 2016. The revised timeline provides additional time for detailed environmental and economic review of the alternatives identified and is consistent with requirements of the State Water Board's Recycled Water Policy.

On December 6, 2013, the Regional Water Board approved an extension to the Schedule for CV-SALTS through Resolution R5 2013-0149. The updated timeline includes the following activities:

January 2014 – June 2014

- ✓ Complete draft evaluation of water quality objectives protective of agriculture irrigation supply within Central Valley management zones
- ✓ Continue work on archetypes and evaluation of implementation alternatives
- ✓ Complete policy discussions on beneficial uses and appropriate water quality objectives, including:
    - o Criteria for "incidental" MUN
    - o Default values for crop protection and leaching fractions for use with salinity models;
    - o Recommendation for determining the most limiting crop within a sub-basin
- ✓ Complete initial implementation analyses (SSALTS)

June 2014 – December 2014

- ✓ Complete Phase 2 Conceptual Model
- ✓ Tulare Lake Bed Groundwater MUN Evaluation Archetype
- ✓ Sacramento Valley Ag Dominated Surface Water MUN Evaluation Archetype

January 2015 – May 2015

- ✓ Initiate Phase 3 of Conceptual Model
- ✓ Refine and identify additional management alternatives
- ✓ Initiate economic review of alternatives
- ✓ Initiate CEQA Equivalent Documentation

June 2015 – December 2015

- ✓ Continue economic review of alternatives
- ✓ Continue CEQA Equivalent Documentation
- ✓ Lower San Joaquin River Salt and Boron Water Quality Objectives
- ✓ Prepare SNMP

January 2016 – May 2016

- ✓ Submit Central Valley Salt and Nitrate Management Plan for Central Valley Water Board review

Annual updates to the State Water Board and annual workshops for the Central Valley Water Board are included within the workplan to evaluate progress and keep the public apprised of activities. Figure 2 provides a brief summary of the overall project timeline, while Figure 3 provides a more detailed timeline for the technical projects.
In order to meet the activities and timelines identified above and in Figures 2 and 3, availability of the existing CAA funding must be extended to 2016. An extension request is pending.

Table 1. Cleanup and Abatement Account Funding Allocated to CV-SALTS **Figures as of 30 September 2013**

CAA Funding	Resolution 2009-0023 ($1.2-mil) Obligated	Expended	Remaining	Projected FY13/14	Projected FY14/15/16	Total
SJVDA Contract #09-076-150 $1.2-million						
a. SJVDA Mgt. Services	$82,262	$77,447	$4,815	$4,815		$82,262
b. BUOS Phase I	$49,982	$49,982				$49,982
c. Program Mgt/Facilitation	$742,756	$674,927	$67,828	$67,828		$742,756
□Strategy/Framework/Workplan Feb 2012						
□Facilitation of Policy Discussions						
□Outreach (website, brochure, workshops)						
d. Technical Support						
●Technical Project Management	$111,915	$111,915	$0			$111,915
□Framing Conceptual Model; finalize Salt Source guidance; Initial budget reviews						
●Long Term LSJR Committee Manager ($288,008)	$213,085	$57,379	$155,706	$155,706		
Total :	**$1,200,000**	**$971,650**	**$228,349**	**$228,349**	**$0**	**$1,200,000**
Percent of $1.2-million:	**100%**	**81%**	**19%**	**100%**	**0%**	**100%**
***Work Products**				% of Remaining $228K		

CAA Funding	Resolution 2010-0042 ($3.8-mil) Obligated	Expended	Remaining	Projected FY13/14	Projected FY14/15/16	Total
SJVDA Contract #11-123-555 - $3.8-million						
a-1. SJVDA Mgt. Services	$176,500	$51,753	$124,747	$93,560	$31,187	$176,500
a-2. SJVDA Mgt. Services allocation 2	$142,500	$0	$142,500	$71,250	$71,250	$142,500
b. Technical Support						
●Technical Project Manager	$296,098	$201,935	$94,163	$94,163		$296,098
*Scopes of work: Concept Model; BUOS II; AGR Zone; Groundwater MUN; LSJR wkpln						
●Basin Planning Support	$104,789	$104,776	$13	$13		$104,789
□White Paper-Salinity Effects on MUN-Related Uses						
□White Paper-Salinity Effects on AGR-Related Uses						
●Interim LSJR Committee Manager	$50,000	$31,413	$18,587	$18,587		$50,000
● LSJR Committee Manager contract	$65,615		$65,615	$65,615		$65,615
*Final wkpln; problem statement; background; beneficial use review; RFQ for technical work						
c. Refine BUOS Phase II						
●Additional GIS Work	$100,004	$98,631	$1,373	$1,373		$100,004
d. Conceptual Model (Three Phases)						
●Initial Conceptual Model Phase 1	$473,864	$472,007	$1,857			$473,864
Additional Data Support	$22,000	$22,000	$0			$22,000
●Conceptual Model Phase 2:SNMP	$575,000		$575,000	$287,500	$287,500	$575,000
* Work Plan			$0	$0		$0
*Source Loading						
*background Water Quality						
*Amimative Capacit Analysis						
*Management Zone Study						
*Analysis and Prepare SNMP Document						
●Conceptual Model Phase 3:refine SNMP			$500,000		$500,000	$500,000
*Monitoring Planning						
*Conduct Economic Analyses						
*Perform Antidegradation Analysis						
●Completion SSALTS Implementation Study			$100,000	$100,000		$100,000
e. Technical Studies						
□Aquatic Life Criteria Review	$31,500	$22,050	$9,450	$9,450		$31,500
□Tulare Lake Bed GW MUN Archetype	$100,000	$0	$100,000	$100,000		$100,000
□MUN POTW Archetype	$200,000	$0	$200,000	$150,000	$50,000	$200,000
*MUN POTW Water Analysis	$60,000	$35,573	$24,427	$24,427		$60,000
□AGR Water Quality Zones	$120,000	$113,912	$6,088	$6,088		$120,000
□Strategic Salt Accumulation Land and Transportation Study (SSALTS)	$345,000	$159,740	$185,260	$138,945	$46,315	$345,000
g. CEQA Documentation			$300,000		$300,000	$300,000
h. CV SNMP			$37,076		$37,076	$37,076
Total	**$2,862,870**	**$1,313,789**	**$2,486,156**	**$1,160,971**	**$1,323,328**	**$3,799,946**
Percent of 3.8 million:	**75%**	**35%**	**65%**	**47%**	**53%**	**100%**
				% of Remaining $2.5M		

Obligated = subcontract approved and/or in progress Total CAA $2,285,440

Table 2 Summarized CV-SALTS Stakeholder Contributions: 2008 - 2013 with Projections

As of 11/1/12

Stakeholder Contributions*	Calendar Year 2008-2009	2010	2011	2012	2013	Projected 2014-16 **	Projected Total
Direct Workplan Support							
CVSC CV-SALTS Support							
CVSC Mgt. and Support for CV-SALTS	$228,491	$206,942	$120,000	$48,000	$220,000	$1,326,297	$2,149,730
CVSC Technical Studies							
a. Salt Source Pilot Study	$170,228	$100,000	$100,000	$68,896	$0	$0	$439,124
b. Consultant Contribution		$55,588					$55,588
Subtotal:	**$398,719**	**$362,530**	**$220,000**	**$116,896**	**$220,000**	**$1,326,297**	**$2,644,442**
Stakeholder Direct Workplan Support							
CVCWA Variance BPA			$40,000	$89,744	$22,000		$151,744
Animal Drinking Water Criteria				$29,000			$29,000
Tulare Lake Planning Support				$50,000	$50,000	$50,000	$150,000
CA Rice Commission Planning Support				$54,000	$54,000	$54,000	$162,000
City of Dixon Planning Support			$18,000	$17,000			$35,000
Sac Regional Planning Support			$15,000	$15,000	$10,000	$10,000	$50,000
Groundwater Archetype (Tulare)				$100,000	$100,000		$200,000
MUN POTW Archetype				$30,000	$30,000	$30,000	$90,000
LWA Team ICM Value Added					$568,000		$568,000
Subtotal:	**$0**	**$0**	**$73,000**	**$384,744**	**$834,000**	**$144,000**	**$1,435,744**
Total Direct Workplan Support	**$398,719**	**$362,530**	**$293,000**	**$501,640**	**$1,054,000**	**$1,470,297**	**$4,080,186**
Additional Stakholder Contributions Related to the Workplan							
Gathering Water Quality Information							
USBR West Side Study	$100,000	$100,000	$200,000	$25,000			$425,000
USBR Real Time Mgt Support	$100,000	$200,000	$200,000	$225,000	$150,000	$150,000	$1,025,000
Dairy Representative Monitoring	50,604	50,604	809,670	910,879	230,020	78,207	$2,129,985
EKI Turlock Basin Study		$50,000					$50,000
Subtotal:	**$250,604**	**$400,604**	**$1,209,670**	**$1,160,879**	**$380,020**	**$228,207**	**$3,629,985**
Treatment Alternative Studies							
City of Vacaville			$302,558				$302,558
Tulare Lake Drainage District			$2,760,072	$725,491	$1,200,000		$4,685,563
FREP Low Salt Processes			$100,000	$100,000	$900,000		$1,100,000
Wine Institute Salinity/Land App Studies					$1,050,000		$1,050,000
Cures Nitrate BMP Study Grant					$174,189	$174,189	$348,377
Dairy Waste Pond Studies	$57,000	$111,007	$111,007				$279,014
CVCWA Controls Toolbox				$44,050			$44,050
Subtotal:	**$57,000**	**$111,007**	**$3,273,637**	**$869,541**	**$3,324,189**	**$174,189**	**$7,809,562**
Total Additional Stakeholder Contributions	**$307,604**	**$511,611**	**$4,483,307**	**$2,030,420**	**$3,704,209**	**$402,395**	**$11,439,547**
Total:	**$706,323**	**$874,141**	**$4,776,307**	**$2,532,060**	**$4,758,209**	**$1,872,692**	**$15,519,733**

*** Project details shown in Table 4, Detailed Stakeholder Contributions**
**** Projected totals based on past efforts not agency commitments**
Ongoing multi-year projects may be averaged over years presented
Costs above do not include efforts required by RWQCB Permits

Table 3 CV-SALTS Annual Resources: Available Funding, Expenditures & Projections

Annual	Year					
	2009	**2010**	**2011**	**2012**	**2013**	**2014 +****
CVSC Workplan	$398,719	$362,530	$220,000	$116,896	$220,000	$1,326,297
Stakeholder Direct Workplan	$0	$0	$73,000	$384,744	$834,000	$144,000
CAA Expended	$0	$387,764	$433,527	$562,317	$901,828	
CAA Projected						$2,714,564
Workplan Expended to Date	**$398,719**	**$750,294**	**$726,527**	**$1,063,957**	**$1,955,828**	**$1,470,297**
Stakeholder Related to Workplan*	$307,604	$511,611	$4,483,307	$2,030,420	$3,704,209	$402,395
Cumulative						
	2009	**2010**	**2011**	**2012**	**2013**	**2014 +****
CVSC Funds	$398,719	$761,249	$981,249	$1,098,145	$1,318,145	$2,644,442
Total Stakeholder Direct Workplan	$0	$0	$73,000	$457,744	$1,291,744	$1,435,744
Stakeholder Related to Workplan*	$307,604	$819,215	$5,302,522	$7,332,942	$11,037,151	$11,439,546
Total Stakeholder Expenditures	$706,323	$1,580,464	$6,356,771	$8,888,831	$13,647,040	$15,519,732
CAA Uncontracted	$1,054,070	$745,294	$976,766	$2,083,852	$937,131	$0
CAA Committed to Contracts	$145,930	$454,706	$2,223,224	$2,916,148	$4,062,869	$5,000,000
CAA Expended to Date	$0	$387,764	$821,291	$1,383,608	$2,285,436	
Total Expended to Date	$706,323	$1,968,228	$7,178,062	$10,272,439	$15,932,476	
Total Projected Expenditures			$7,000,000	$10,000,000	$16,000,000	**$20,000,000**
% Stakeholder Expended Funds	100%	80%	89%	87%	86%	

Costs above do not include efforts required by RWQCB Permits
* Other Stakeholder expenditures for this chart do not include Implementation Costs of $38,764,871
** Projected

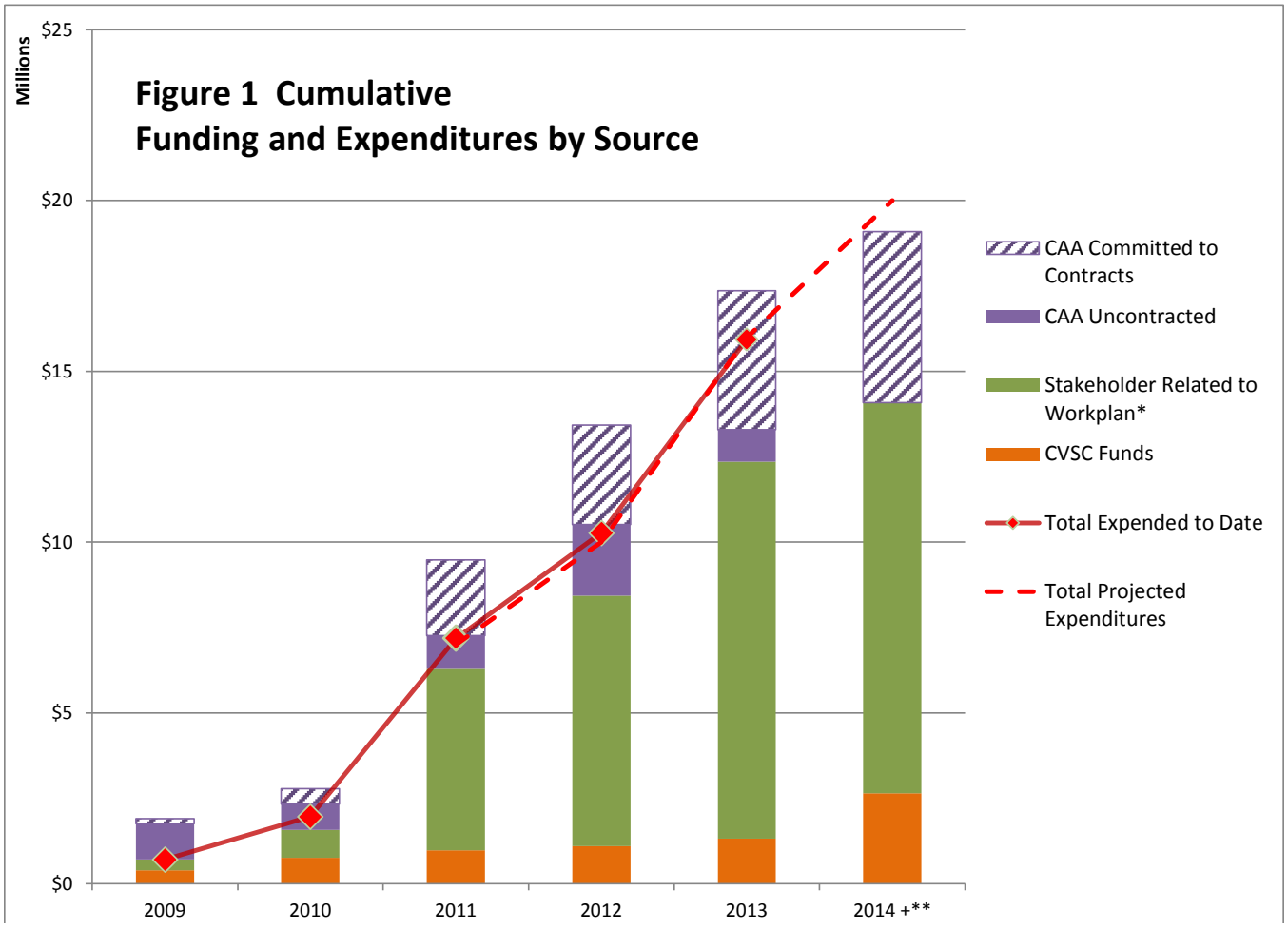

Table 4. Detailed Selected Stakeholder Contributions to Manage Central Valley Salt and Nitrate 11/9/2013

Type of Contribution Agency Project/Effort Name	Contributes to CV-SALTS by:	Cost to Date Voluntary	 Permit Required
Treatment Alternatives		$7,504,913	$206,440
City of Vacaville			
Alternate Water Supply and Source Water Treatment Feasibility Cost Analysis	Alternate Water Supply and Source Water Treatment Feasibility Cost Analysis	$62,588	
Major permitted industrial users conduct Salinity Treatment Feasibility Cost Analysis.	Determine feasibility and costs of treating major salinity waste streams, identified from Source Identification Studies, to achieve a specified reduction in salinity mass loading.	$240,000	$40,800
Receiving Water Study	Characterize Receiving water follow-on work from the WQM Study		$57,988
Tulare Lake Drainage District (TLDD)			
Metropolitan Water District (MWD) Drainage Water Treatment Feasibility Study	TLDD and MWD evaluated the feasibility of using agricultural drainage water to secure additional water supplies by processing the drainage water through reverse osmosis	$150,000	
Pearl H20 Pilot Drainage Water Treatment Trial	Engineering designed and tested a lab scale pilot that treated TLDD's drainage water utilizing an anaerobic selenium bioreactor and reverse osmosis	$1,692,000	
Combined Solar Technologies Drainage Water Treatment Pilot	Pilot plant treating TLDD's drainage water with local bio-fuel, thermal reactors, and boilers to convert drainage water into product water and zero-liquid discharge	$186,131	
Renewable Energy and Water Drainage Water Pilot	Evaluated the feasibility of treating TLDD's drainage water with an on-site pilot plant utilizing a polymer based resin and reverse osmosis	$731,941	
UCLA Water Technology Research for Reverse Osmosis advances	UCLA researchers testing new class of reverse-osmosis membranes for desalination that resists the clogging from drainage water desalination.	$350,000	
New Sky Energy Ag Water Treatment Pilot	Developing technology to treat agricultural drainage water with reverse osmosis and convert the waste concentrate into useable products	$10,000	

Table 4. Detailed Selected Stakeholder Contributions to Manage Central Valley Salt and Nitrate 11/9/2013

Type of Contribution Agency Project/Effort Name	Contributes to CV-SALTS by:	Cost to Date Voluntary	 Permit Required
Merlin Bird Radar and Deterrent Technology	Merlin tested the bird deterrent effectiveness of their radar controlled automated tracking and long range acoustical sound devise on TLDD's evaporation basins	$30,000	
Enhanced Evaporation Trial with Large Impact Sprinklers	Tested the effectiveness of enhancing evaporation over an evaporation basin cell utilizing large volume impact sprinkler heads	$115,000	
Spray Field (Enhanced Evaporation) Pilot Trial with Small Micron Nozzles (1 Acre)	Testing the effectiveness of "enhanced evaporation" over ponded water in a basin cell employing closely spaced small micron spray heads for drainage water disposal	$1,200,000	
Sac Regional CSD			
Salinity Minimization Plan	Sac Regional has completed a Salinity Minimization Plan under their NPDES Permit to manage salts identifying salt sources for CV-SALTS.		$63,064
Source Evaluation Study	Analyzing salinity in the metropolitan Sacramento Area		$44,588
Facilities and Staff Support for CV-SALTS	Meeting Location and support service provided for three plus years.	$40,000	
Central Valley Clean Water Association			
Salinity Toolbox for POTWs	CV-SALTS, POTWs, and RWB staff with effective management tools to control salts at POTWs. The toolbox will be vetted through CV-SALTS and streamline future efforts by all parties involved.	$44,050	
Food Processors/Wine			
Low Salt Peeling Research and Development (FREP Grant)	Implementation study by UC and CSU facilities under FREP into the source reduction options for food processing by low salt or steam peeling while maintaining product quality.	$900,000	
Wine Institute			
Land application Study for Wineries	Improving land application practices for wineries and reducing nitrate and salt contributions	$1,050,000	
Salinity and Energy Reduction Manual	Reducing Salt Contribution in process water discharges and energy reduction across the organizations in Central Valley.	$250,000	
Coalition Urban Rural Environmental Stewardship (CURES)			

Table 4. Detailed Selected Stakeholder Contributions to Manage Central Valley Salt and Nitrate 11/9/2013

Type of Contribution Agency Project/Effort Name	Contributes to CV-SALTS by:	Cost to Date Voluntary	 Permit Required
Cost Efficient Nitrate BMP Development for Irrigated Agriculture (FREP Grant)	Study, identify, and pilot test methods for measuring movement of nitrates beyond the root zone of irrigated crops by a nutrient management plans via Specialty Crop Block Grant.	$174,189	
Dairy Cares/Western United Dairymen			
Animal Waste Pond Studies	2007 and 2012 studies reviewed literature on pond performance as salinity and nutrient sources to groundwater and recommendation pond characterization method	$279,014	
Support for Basin Planning Activities		$1,637,089	$13,886
City of Vacaville			
General Salinity Public Education and Outreach	To increase awareness of salinity impacts to the wastewater treatment plant effluent and environment.		$13,886
Central Valley Clean Water Association			
Variance Basin Plan Amendment Assistance	Provides the regulatory option while CV-SALTS is developed to participate in CV-SALTS and ultimate long term solutions rather than immediate low benefit projects.	$129,744	
CV-SALTS Committee and Engagement Support	Supports CV-SALTS and CVCWA Members by engagement on work of CV-SALTS meetings, committees, for technical & regulatory support towards a long-term sustainable solution.	$53,200	
Central Valley Salinity Coalition			
Support for Administration Facilitation	CVSC provides support for CV-SALTS Committees, Committee meetings, website, logistics and for Coalition Building supporting SNMP. Providing support for TAC Chair and specialty consultants.	$766,433	
Pilot Salt and Nutrient Source Identification Study	The Salinity Coalition funded and managed study as a predecessor to SNMP, covering approximately 10% of the Central Valley. The consultants performed work in addition to the scope paid	$519,712	
Dairy Cares/Western United Dairymen			
Stock Water Quality Criteria Study (FREP Grant)	Study to document the water quality criteria of stock animals for salt and nitrates to support CV-SALTS standard setting processes and planning	$29,000	

Table 4. Detailed Selected Stakeholder Contributions to Manage Central Valley Salt and Nitrate 11/9/2013

Type of Contribution Agency Project/Effort Name	Contributes to CV-SALTS by:	Cost to Date Voluntary	 Permit Required
Tulare Lake Drainage District			
Committee Chair Support	Tulare Lake interests authorized a consultant familiar with the Central Valley needs and Ag interests to participate in CV-SALTS as the TAC Chair.	$50,000	
California Rice Commission			
Consultant Participation and Support	Agricultural Coalitions and interested funded consultants to participate on their behalf in CV-SALTS committees and assist in outreach development and in meetings.	$54,000	
City of Dixon			
Committee Chair Support	The City of Dixon authorized a consultant familiar with the Central Valley needs and wastewater issues to participate in CV-SALTS as the Education and Outreach Chair.	$35,000	
Gathering Water Quality Information		$3,173,000	$2,803,121
City of Vacaville			
Household Self Regenerating Water Softener Study	Determines contribution of salinity, if any, from residential water softeners relative to baseline levels from homes without water softeners.		$61,391
Conduct Electrical Conductivity Monitoring in Sanitary Sewer System	Quantify contribution of salinity from sanitary sewer service areas based on continuous measurement of electrical conductivity.		$28,678
Conduct Citywide Water Softener Survey	To obtain an estimate of the number, location, age, type, and status of water softeners installed at residential, commercial, and industrial addresses.		$37,886
Industrial User Monitoring of Source Water and Wastewater	Determine maximum salinity mass loading reduction by determining change in salinity from source water to wastewater.		$17,856
Major industrial users conduct Salinity Source Identification Studies	To quantify salinity sources of various waste streams generated within major industrial permitted industries.		$120,000
US Bureau of Reclamation			
West Side SJR Salt and Nutrient Source Study	Provides information on the sources of salts and nitrated focused on the West side of the San Joaquin River and coordinated with data needed for CV-SALTS.	$425,000	

Table 4. Detailed Selected Stakeholder Contributions to Manage Central Valley Salt and Nitrate 11/9/2013

Type of Contribution Agency Project/Effort Name	Contributes to CV-SALTS by:	Cost to Date Voluntary	 Permit Required
Ironhouse Sanitary District			
Salinity Management Plan	Determining sources of salinity from a 95% domestic system		$37,310
EKI Consultants			
Turlock Salt Management Study	Independent Study of the Turlock basin for Salt Balance contributed to CV-SALTS.	$50,000	
LWA Team of Consultants			
Value Added ICM Report Contribution	Ensuring that the innovative work that was completed for CV-SALTS met the original scope of work and provided a solid foundation for the Phase II Conceptual Model. Costs in excess of amount billed.	$568,000	
Dairy Cares/Western United Dairymen			
Representative Monitoring Program	Conducts groundwater monitoring on 45 dairies/300 monitoring wells plus dairy operating and physical conditions to assess management practices. Provides info to CV-SALTS	$2,130,000	$2,500,000
Implementation Activities to Manage Salt and Nitrate		$32,490,086	$4,230,304
Grassland Area Farmers			
San Joaquin River Improvement Project	The SJRIP has many project components some of the elements that are most related to salinity management and CV-SALTS are included. Only Local districts and federal funds shown.	$16,921,215	$4,230,304
Grasslands Area Firebaugh Canal WD salinity reduction projects	Many projects which reduce salinity through reduction of seepage from canals which result in problematic saline waters in the environment. Only local funding share shown.	$9,545,000	
US Bureau of Reclamation			
Real Time Management Studies and efforts	Research and coordination on an alternative for management of salt in the San Joaquin River to improve water quality and more efficiently use dilution waters.	$725,000	
Tulare Lake Drainage District (TLDD)			
Spray Field (Enhanced Evaporation) project with Small Micron Nozzles (120) Acres	Full Scale trial project utilizing "enhanced evaporation" over ponded water in a basin cell employing closely spaced small micron spray heads for drainage water disposal	$5,263,606	

Table 4. Detailed Selected Stakeholder Contributions to Manage Central Valley Salt and Nitrate 11/9/2013

Type of Contribution Agency Project/Effort Name	Contributes to CV-SALTS by:	Cost to Date Voluntary	Cost to Date Permit Required
Dairy Cares/Western United Dairymen			
California dairy industry-wide study of salinity sources and management practices	Study identified main salinity sources on dairies, irrigation water/feeds and identified management practices used to reduce or minimize salinity	$35,265	
Ongoing Agency Efforts That Parallel and are Linked to CV-SALTS		$11,000,000	$0
CA Department of Water Resources			
Agricultural Drainage Program	Participating in the CV-SALTS program and conducting the Ag. Drainage Program which activities are compatible with the goals of the CV-SALTS.	$9,750,000	
San Joaquin River Real-time Water Quality Monitoring	Meeting SJR water quality objectives for salinity near Vernalis and preserving high quality New Melons water while lowering salt concentrations entering the Delta.	$1,250,000	
Total Voluntary Contributions, Regulatory Required and Agency Efforts:		**$55,805,088**	**$7,253,751**

Figure 2 - Summarized CV-SALTS Workplan Schedule

Revised 11/1/13

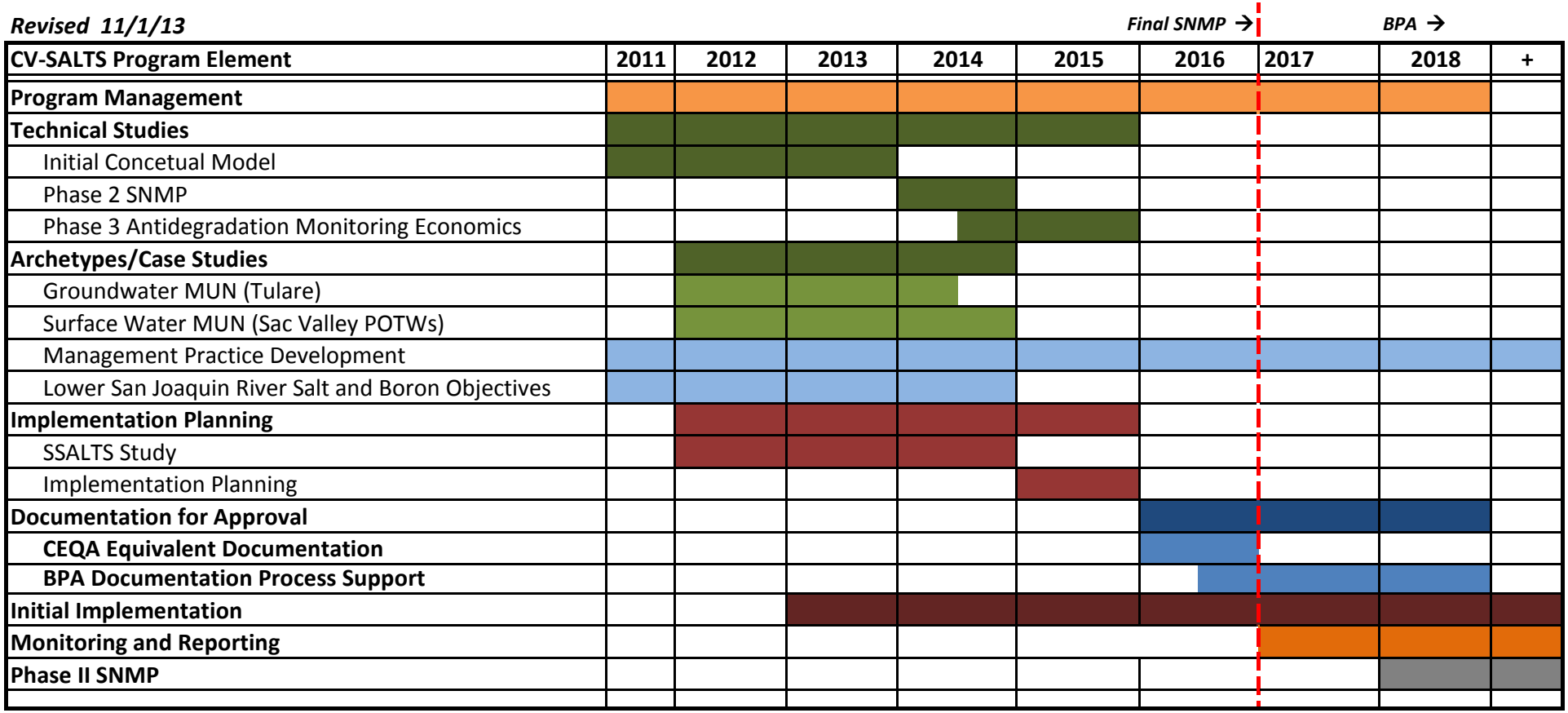

Figure 3. CV-SALTS Technical Project Timeline: 2012 - 2016

Technical Area	Primary Activities	SNMP Support	2012	2013	2014	2015	2016
Conceptual Model Development	Initial Conceptual Model	• Source identification • Assimilative capacity • Loading estimates					Prepare Final SNMP
	Phase 2	• Source and loading refinement • Background water quality/ assimilative capacity calculation methods • Management zone study					
	Phase 3	• Antidegradation analysis • Monitoring plan • Economics analysis					
Data Development	GIS – Phase 2	• Baseline database					
	Agriculture Zone Mapping	• AGR implementation tools					
Beneficial Use Studies	Tulare Lake Bed MUN Archetype	• MUN implementation tools					
	MUN Beneficial Use in Agriculturally Dominated Water Bodies Archetype	• MUN implementation tools					
Water Quality Objectives	Salinity-related Effects on Agricultural Irrigation Uses	• Evaluation of science behind establishment of salinity related objectives					
	Salinity Effects on MUN-related Uses of Water						
	Stock Watering Study						
	Aquatic Life Study						
Implementation Planning	Strategic Salt Accumulation Land and Transport Study (SSALTS)	• SNMP implementation measures to manage salt on a sustainable basis					
	Post- SSALTS Implementation Planning						
Lower San Joaquin River Committee	Technical Analyses (salt loading characterization, modeling)	• Coordination with CV-SALTS SNMP development activities to ensure consistency					
	Basin Planning Activities (WQOs, SED, economics, monitoring, implementation)						

Attachment A.
Technical Projects Supporting Central Valley-wide Salt and Nitrate Management Plan

Conceptual Model Development

Salt and Nitrate Sources Pilot Implementation Study - The *Salt and Nitrate Sources Pilot Implementation Study* ("Pilot Study) was the precursor to what is now described as the development of a Conceptual Model for the Central Valley. The primary objective of the Pilot Study was to develop a methodology and provide guidance for development of the Salt/Nutrient Management Plan for the Central Valley. Specifically, the project developed and documented methods to fairly and equitably quantify salt and nitrate sources. These methods were then pilot tested in selected Central Valley areas to evaluate their appropriateness for region-wide application. Following completion of the Pilot Study, CV-SALTS developed *A Framework for Salt/Nitrate Source Identification* Studies based on the findings from the Pilot Study. Status: Project was completed in February 2010.

Initial Conceptual Model (ICM) - Development of the ICM is the first phase of a planned three-phased effort to develop the technical and regulatory basis for adoption of a Salt/Nutrient Management Plan (SNMP) for the Central Valley. The purpose of this phase is to develop a conceptual level (or 30,000 foot level) analysis of water balance and associated salt and nutrient (nitrate) conditions in the Central Valley. This effort will rely on the establishment of Initial Analysis Zones (IAZs) to complete water quantity and quality analyses within smaller areas within the valley and detailed analyses in two selected subareas of the Central Valley. The IAZs provide the foundation for the eventual establishment of salt/nutrient management zones in the Basin Plan. The outcome of the ICM project will be an assessment of salt/nitrate conditions in the Central Valley, including identification of hotspots and long term trends for salt and nitrate concentrations. Subsequent phases will refine the findings from the ICM and develop the SNMP which includes preparation of a salt/nitrate program of implementation and completion of regulatory analyses to support adoption of the SNMP into the Basin Plan. Status: Project was initiated in September 2012 with completion of all tasks expected in October 2013.

Phase 2 Conceptual Model - Development of the Conceptual Model to support preparation of the Salt/Nitrate Management Plan (SNMP) was initiated under CV-SALTS' Initial Conceptual Model (ICM) Project (to be completed in October 2013). This project will build off the findings of the ICM to begin development of a draft SNMP for the Central Valley. Work on this phase is expected to be initiated in October 2013. Scope of work elements are expected to include refinements to the analyses completed under the ICM Project, development of salt and nitrate data analysis methods to support regulatory decisions, implementation of an archetype or pilot analysis to evaluate salt and/or nitrate management options at a management zone scale, and preparation of the first drafts of the technical elements of the SNMP. Status: Project is planned for initiation October 2013 with completion expected in June 2014.

Phase 3 Conceptual Model - Development of the Conceptual Model to support preparation of the Salt/Nitrate Management Plan (SNMP) was initiated under CV-SALTS' Initial Conceptual Model (ICM) Project (to be completed in October 2013) and refined under the CV-SALTS' Phase 2 Conceptual Model project. This project will build off the work completed under Phase 2 and focus on completion of regulatory-related analyses and preparation of documentation to support adoption of the SNMP into the Basin Plan. Status: Project is planned for initiation after June 2014.

Data Development Projects

GIS Services - Phase 1 Beneficial Use & Objectives Study (BUOS) - CV-SALTS began data gathering and Geographic Information System (GIS) development efforts through the implementation of the Phase 1 BUOS. This project included three tasks: (a) Identification of existing and potential beneficial uses in the Central Valley which included development of GIS mapping layers showing beneficial use categories assigned to surface water and groundwaters; (b) compilation of data for use in the development of the beneficial use map layers; and (c) completion of a literature review of criteria related to salt and nutrients and protection of various beneficial uses. Status: Project was completed in September 2010

GIS Services – Phase 2 - CV-SALTS continues to develop a Geographic Information System (GIS) to organize information pertaining to the beneficial uses, water quality objectives, water use infrastructure, and water quality of surface water and groundwater in the Central Valley. Development of this GIS supports ongoing efforts to develop a Salt/Nutrient Management Plan (SNMP) for the Central Valley by providing a centralized geodatabase for all matters pertaining to the development and implementation of the SNMP. This project builds off the CV-SALTS Phase 1 Beneficial Use Objectives Study (BUOS), which established baseline GIS-related data to support CV-SALTS. Phase 2 will update the existing geodatabase to incorporate the 2012 National Hydrography Dataset and incorporate new water infrastructure-related data, e.g., municipal surface water intakes, locations of wastewater facility discharges to surface water, agricultural water intakes, and groundwater wells. Status: Project initiated in September 2012; planned for completion in October 2013.

GIS Services – Agricultural Zone Mapping - CV-SALTS has initiated a GIS project to develop map layers of agricultural-related data to support development and implementation of water quality objectives to protect waters used for agricultural irrigation. Data layers to be incorporated into the CV-SALTS geodatabase include agricultural-related jurisdictional boundaries, soil characteristics, irrigation supply sources, water quality, historic and current cropping patterns, and other data as appropriate. These data layers will be used to identify potential Crop Sensitivity Zones (CSZs) based on similar hydrologic and hydrogeologic conditions, cropping patterns, management practices, and other factors related to crop sensitivity to salinity. This project is currently planned to occur in two phases. Phase 1 deliverables include (a) data development and preparation of GIS map layers; (b) identification of up to 25 CSZs for the Central Valley; and (c) test of the proposed methodology to determine the applied water sensitivity threshold (AWST) in one of the CSZs. Phase 2 will be the continuation of the effort to determine AWSTs for the remaining delineated CSZs. Prior to initiation of Phase 2, the findings from Phase 1, including the proposed methodology to determine AWSTs, will be evaluated with stakeholders to ensure the procedures for defining CSZs and AWSTs are aligned with CV-SALTS policy development. Status: Project implemented February 2013; Phase 1 completion is expected in fall 2013; Phase 2 schedule is to be determined.

Beneficial Use Designation Studies

Tulare Lake Bed MUN Archetype - As part of its effort to develop a Salt/Nutrient Management Plan (SNMP) for the Central Valley, CV-SALTS is evaluating appropriate designations and level of protection for waterbodies currently designated with the MUN beneficial use, taking into account the requirements of the California Sources of Drinking Water Policy (SDWP) (Resolution 88-63) and other environmental characteristics. Through this activity, a portion of the Tulare Lake Bed

groundwater basin has been identified as an area that appears to meet the exemption criteria set forth in the SDWP. Accordingly, CV-SALTS initiated technical studies and basin planning activities in collaboration with the Tulare Lake Drainage District to develop the required documentation to support de-designation of MUN from a portion of groundwater body underlying the Tulare Lake Bed. The expected final outcome is a Basin Plan Amendment. In addition, the project deliverables will support development of the Central Valley SNMP by providing an archetype or template for other studies designed to evaluate the applicability of a MUN use on a groundwater body. Status: Project initiated in September 2012; completion expected in in fall 2014.

MUN Beneficial Use in Agriculturally Dominated Water Bodies Archetype - By way of the Sources of Drinking Water Policy (Resolution 88-63), the Central Valley Regional Water Quality Control Board Basin Plans (Basin Plans) designate MUN beneficial use to all surface and groundwater bodies unless they are specifically listed in a Basin Plan as water bodies that are not designated with MUN. Recent court findings have confirmed that to utilize exceptions identified in Resolution 88-63, for constructed and modified natural channels used to transport agricultural drainage, a basin plan amendment is required. . The CV-SALTS initiative has identified the need to evaluate the appropriate designation and level of protection of MUN beneficial uses in constructed agricultural drains as well as other agriculturally dominated water bodies. The receiving waters of four POTWs in the cities of Willows, Colusa, Biggs and Live Oak are serving as archetypes or case studies for the development of a framework to evaluate the appropriate level of MUN beneficial use protection in agriculturally-dominated water bodies throughout the Central Valley. Status: Project initiated in the latter part of 2011; completion expected in 2015.

Water Quality Objectives Review

Aquatic Life Study - CV-SALTS is implementing a study to identify potential water quality criteria that could be used to establish salinity-related water quality objectives to protect aquatic life in Central Valley surface waters. This study is researching the following information sources to fulfill the project purpose: (a) recent literature reviews conducted by selected states to establish water quality criteria for salinity-related constituents; (b) peer-reviewed published literature; (c) data and methodologies developed by federal agencies, including U.S. Environmental Protection and Department of Interior; (d) recommendations developed by selected international agencies; and (e) any information developed by other California agencies. The final report will provide technical recommendations for adoption of salinity-related water quality objectives to protect aquatic life. Status: Project initiated in December 2012; completion expected in Fall 2013

Stock Watering Study - CV-SALTS implemented this study to identify water quality criteria that may be used to establish salinity and nitrate-related water quality objectives to protect stock watering supplies in the Central Valley. This study was completed through the completion of research on the following information sources: (a) water quality objectives established in other regions of California or in other selected states; (b) review of U.S. Environmental Protection Agency recommendations; (c) university extension publications and specialists; (d) published peer-reviewed literature; and (e) selected international agencies. The final report provides recommendations for protection of stock watering sources which will be used to support development of a Salt/Nutrient Management Plan for the Central Valley. Status: Project was initiated in January 2012; completed May 2013.

Salinity-related Effects on Agricultural Irrigation Uses - CV-SALTS completed research to define what constitutes reasonable protection of existing and probable future use of water for agricultural irrigation. This research focused on the preparation of a summary of the current state of knowledge regarding the effects of elevated salinity concentrations on crop yields, wetland plants and vegetation commonly used for landscaping. In addition, the research effort reviewed water quality objectives established in other California regions, federal recommendations developed by the U.S. Environmental Protection Agency, water quality standards adopted by other states to protect water used for irrigation, and guidelines established by selected international entities. The resulting White Paper provides a summary of the key findings along with supporting data and references. to support development of a Salt/Nutrient Management Plan for the Central Valley and ensure that waters used for agricultural irrigation are appropriately protected. Status: Project was initiated in June 2012. A draft White Paper was submitted in July; a Final Draft White Paper was submitted in August 2012. A final document is in preparation.

Salinity Effects on MUN-related Uses of Water - CV-SALTS completed research to define what constitutes reasonable protection of existing and probable future MUN (Municipal and Domestic Supply) uses. This research focused on the preparation of a summary of the current state of knowledge regarding the effects of elevated salinity concentrations on drinking water supply, including human health concerns, and other domestic uses of water, including impacts of salinity on residential, commercial and industrial water-using devices. In addition, the research effort reviewed water quality objectives established in other California regions, federal recommendations developed by the U.S. Environmental Protection Agency, MUN-related water quality standards adopted by other states, and guidelines established by selected international entities. The resulting White Paper provides a summary of the key findings along with supporting data and references. CV-SALTS is using the findings of the White Paper to support development of a Salt/Nutrient Management Plan for the Central Valley and ensure that MUN-related uses of water are appropriately protected. Status: Project was initiated June 2012; draft White Paper was submitted in July 2012; Final Draft White Paper was submitted in August 2012; Document currently undergoing technical review; final White Paper will be prepared following completion of technical reviews.

Water Quality Objectives Review and Implementation Planning

Lower San Joaquin River Committee – The LSJR Committee was established in 2010 as a subcommittee of the CV-SALTS Initiative. Operating as a subcommittee of the CV-SALTS Executive Committee, the LSJR Committee is developing recommendations for updated salt and boron objectives, and an implementation plan to support those objectives. Members of the committee are stakeholders in the LSJR Watershed with an interest in the management of salt. Committee members represent municipalities, irrigated agriculture, food processors, irrigation districts, and state and federal agencies. The committee has completed a review of beneficial uses for the portion of the LSJR between the Merced River and Vernalis and is currently evaluating alternative water quality objectives that would be protective of municipal and domestic supply, irrigated agriculture, stock watering and aquatic life. The current workplan anticipates a proposed Basin Plan Amendment during 2015.

Implementation Planning

The Economic Impacts of Central Valley Salinity - The purpose of this study was to measure the economic impacts of increasing salinity in the Central Valley out to the year 2030. To conduct the analysis, the project team assumed that there would be no change in current salt management policies; as such, the findings from the analysis represented the economic impacts associated with taking no action. The study was conducted on an aggregate valley-wide basis that averaged salinity effects and costs. Based on estimates of increasing levels of salinity under existing conditions, the study estimated the direct economic effects on industry, residential, food processing, confined animal operations, and irrigated agricultural production in the Central Valley using different physical and economic models. Status: Project was completed in 2009.

Strategic Salt Accumulation Land and Transport Study (SSALTS) - CV-SALTS is implementing a study to identify the range of viable Central Valley alternatives for salt disposal (taking into account regulatory, institutional, economic, and technological issues) to provide input for consideration during development of the Salt/Nutrient Management Plan (SNMP) for the Central Valley. Potential alternatives for salt disposal range from expanded use of existing salt disposal areas, establishment of new salt disposal areas within the Central Valley, export or transport of salt out of the Central Valley, or some combination of the above. The findings from this study will provide input to policymakers regarding where opportunities exist to dispose of salt over the long term in a sustainable manner. In addition, the findings will provide important input to the development of the SNMP under Phases 2 and 3 of Conceptual Model, and provide information to support development of the Basin Plan Amendment to adopt a Central Valley SNMP. Status: Project was initiated in December 2012. Phases 1, 2 and 3 of the SSALTS Project are expected to be complete in October 2013, January 2013, and May 2014, respectively.

More Information on Projects and Current Activities at:

www.cvsalinity.org