

**STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING SESSION – CENTRAL VALLEY WATER BOARD
February 16, 2016**

SUBJECT

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

DISCUSSION

CV-SALTS is a stakeholder lead initiative developing a Central Valley-wide salt and nitrate management plan. The goals of CV-SALTS are to provide for an environmentally and economically sustainable future within the Central Valley and to address legacy groundwater nitrate concentrations that are impacting drinking water supplies. 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.

During this information item stakeholders will present the overall status and direction of the effort. The following required information is included in the attached staff report.

- Expenditures for services and contributions from Stakeholders
- Work accomplishments to date, both contract supported and stakeholder driven
- Work in progress
- Timelines for completion

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.

Policy Review _____

Fiscal Review _____

Legal Review _____

Exec Review _____

STAFF REPORT
CV-SALTS ANNUAL PROGRESS REPORT— FEBRUARY 2016

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 goals of CV-SALTS are to provide for an environmentally and economically sustainable future within the Central Valley and to address legacy groundwater nitrate concentrations that are impacting drinking water supplies. The initiative was formally recognized under a signed Memorandum of Agreement (MOA) between the State Water Resources Control Board, Central Valley Water Board and Central Valley Salinity Coalition (non-profit stakeholder group) in March 2010 and an extension of the MOA was signed in December 2014. 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 Resources Control Board (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 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 \$19,039,579. Of this total, \$3,593,557 (19%) has been provided from the authorized CAA funds, while \$15,436,023 (81%) has

been expended by CV-SALTS Stakeholders, which include CVSC members, other organizations, and agencies. As of November 2015, \$1,169,335 of the CAA funding provided through Resolution No. 2009-003 and \$2,424,222 of the funding provided through Resolution No. 2010-0042 had been expended. Workplan elements totaling an additional \$1,375,773 are either in progress or 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 \$2,092,543 to date. Additional stakeholder contributions directly supporting workplan elements including additional match for some CAA funded projects, total \$3,326,938. Additional contributions related to the workplan include compilation of water quality information (\$6,204,328) and pilot studies evaluating treatment alternatives (\$8,465,542). 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 \$63 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/hour per person. Based on the number of meetings and attendance, between July 2009 and November, CV-SALTS Committee Members contributed more than 16,918 hours participating in Committee and subcommittee meetings supporting CV-SALTS. This participation represents an approximate additional expenditure by the stakeholders of \$1,691,800 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 developed a revised strategy and workplan in February 2012 to help prioritize and focus activities of participating stakeholders. CV-SALTS has completed several of the workplan items, is in-progress on many more and has identified a timeline to ensure thorough economic and environmental review of proposed alternatives for the 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;
 - 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
 - New CVSC Members and continued recruitment
 - 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;
- ✓ Technical support for development of a site-specific boron objective for City of Dixon;
- ✓ June 2012, December 2013, June 2014, and April 2015 Central Valley Water Board Workshop;
- ✓ Co-sponsor of and participant in the Groundwater Resources Association Salinity and Nitrate June 2012 Conference in Fresno;
- ✓ International Salinity Expert Panel convened in Riverside (June 2014)
- ✓ Draft revised Chapter 19 (Salt and Salinity Management) for the California Water Plan 2013 update; and,
- ✓ Coordination, oversight, and cost share of case studies identified below.

Contract Supported:

- ✓ Updated Strategic Framework and Workplan (February 2012);
- ✓ Salinity water quality criteria review for aquatic life (January 2014);
- ✓ White paper on salinity and nitrate impacts on municipal and domestic supply (MUN) (August 2012);
- ✓ White paper on salinity impacts on irrigated agriculture (August 2012);
- ✓ GIS database and beneficial use maps for the Central Valley and Delta (coordinated with State Water Board effort) (October 2013);
- ✓ Initial salinity/nitrate conceptual model (ICM) compiled data; source/fate; initial background and trend analysis for 22 analysis zones (December 2013);

- ✓ Phase 1 of the Strategic Salt Accumulation Land and Transport Study (SSALTS) implementation alternatives study completed (December 2013);
- ✓ SSALTS Phase 2: Development of a range of salt disposal/treatment alternatives for in-valley, out-of-valley, and combination salt management strategies completed (September 2014);
- ✓ Central Valley Salinity brochure available at: http://cvsalinity.org/index.php/document-listing/doc_download/984-salt-story-brochure;
- ✓ Improved functionality of the CV-SALTS website;
- ✓ Four California Environmental Quality Act (CEQA) Scoping meetings were held during October 2013;
- ✓ Phase 1 of the Management zone based evaluation of appropriate salinity water quality objectives to protect irrigated agriculture (April 2014); Lower San Joaquin River salinity and boron water quality objectives and implementation program; and,
- ✓ 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);

In Progress:

- ✓ Phase II Conceptual Model: Updated CV-SALTS project database, develop calculation methods for background water quality and determination of available assimilative capacity in groundwater; development of preliminary draft SNMP that incorporates outcomes of completed technical studies;
- ✓ SSALTS Phase 3: Developing salt management implementation measures and a phased implementation strategy for inclusion in the SNMP that will be finalized in coordination with Nitrate Implementation Measures Study (NIMS);
- ✓ NIMS: Developing technical basis for nitrate implementation measures and a phased implementation strategy for inclusion in the SNMP that will be finalized in coordination with SSALTS;
 - Coordination to identify and refine projects to provide safe drinking water for disadvantaged communities.
- ✓ Drafting of SNMP implementation section that includes implementation measures framework for salt and nitrate management, policies to support implementation, and implementation milestones;
- ✓ Surveillance and Monitoring Plan (SAMP): Development of the surveillance and monitoring approach that will be used to evaluate effectiveness of the program of implementation in the SNMP;
- ✓ SNMP Document development that includes outcome of technical and policy work.
- ✓ Case studies to ground-truth policy and implementation recommendations:
 - Appropriate application and protection of municipal and domestic supply and agricultural beneficial uses in a portion of the unconfined aquifer within the Tulare Lake Bed;
 - Alta Irrigation District Management Zone Archetype study and Implementation assessment; and

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 2015, 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, in order to support preparation of the Salt/Nitrate Management Plan (SNMP), significant work was completed on refining and expanding the Conceptual Model that identified source and fate as well as current and trending concentration of salt and nitrate. Phase 2 of this project builds off the findings of the Initial Conceptual Model which was a high level review of overall source and fate of salinity and nitrate in the Central Valley. Scope of work elements for Phase 2 include targeted refinements to the project database, 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.

Phases 1 and 2 of the Strategic Salt Accumulation Land and Transportation Study (SSALTS) that evaluates alternative salt containment and disposal options were completed. Project reports on Phase 1, which focused on an evaluation of current salt disposal/treatment practices at selected study areas and Phase 2, which concentrates on the development of potential future salt disposal and treatment alternatives for the Central Valley, were completed in 2014. SSALTS developed salt management implementation measures and a phased implementation strategy (based on the findings of earlier phases of the study) for feedback and approval by CV-SALTS for inclusion in the SNMP. To allow for consideration of potential relationships between salt and nitrate implementation strategies, this project was extended to allow the project results for SSALTS to be coordinated with the findings from the Nitrate Implementation Measures Study. A coordinated salt/nitrate implementation approach has been presented to the Executive Committee and is nearing completion.

In addition, specific case studies are ongoing with contributions from the stakeholders that evaluate: (a) appropriate application and reasonable protection of Municipal and Domestic Supply beneficial uses in surface water (Sacramento Valley POTW receiving waters, which was approved by the State Water Board); (b) appropriate application and reasonable protection of the Municipal and Domestic Supply and Agricultural beneficial uses in Tulare Lake Bed groundwater (CEQA/economic analyses and Basin Plan Staff Report are in preparation); and (c) appropriate salt and boron water quality objectives to protect beneficial uses and implementation alternatives (the Lower San Joaquin River) which will be developing a Basin Plan Amendment based on the policy and technical agreement developed.

As the technical efforts and case studies proceeded, the Executive Committee continued focused policy discussions in several areas. Listed below are policy issues that have had significant progress and on-going discussions. Recommendations generated from these policy discussions are being incorporated into the implementation section of the draft SNMP.

Significant Progress

- ✓ Clarify application of Secondary MCLs to protect MUN
- ✓ Establishment of a procedure to translate narrative salinity objectives when developing WDRs for AGR uses

- ✓ Establishment of a proposed permitting strategy for nitrate discharges to groundwater
- ✓ Identification of acceptable methods to characterize trends in assimilative capacity and assess effect of discharge on available assimilative capacity
- ✓ Requirements for establishing a Management Zone
- ✓ Potential alternative compliance strategies (alternate water supplies, offsets, etc.)
- ✓ Factors to be considered when evaluating Best Practicable Treatment or Control (BPTC), Best Management Practices (BMPs), and “best efforts”
- ✓ Factors to consider during “maximum benefit” evaluations

Ongoing

- Developing long-term restoration and compliance schedules for salt and nitrate in groundwaters
- Integrating SNMP with other state policies to facilitate conservation, stormwater harvesting, recycled water reuse, groundwater recharge and drought management

With the Alta Irrigation District Management Zone the group closely coordinates with work being conducted by stakeholders in the Tulare Lake Basin to identify safe drinking water pilot projects. The Alta Irrigation District is participating in the development of a pilot archetype to address Disadvantaged Communities and Nitrate issues.

The first of several 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 has heard informational items on policy discussions in July 2013, and April 2015. In December 2013, the board approved a resolution to extend the end date of the SNMP by two years to May 2016.

The various committees completed additional key tasks as noted below.

During 2015, the Lower San Joaquin River Committee (LSJRC) and its subcontractors, completed technical work needed to support the development of the staff report for a basin plan amendment for salinity along Reach 83 of the Lower San Joaquin River. Draft objectives for electrical conductivity, measured at the San Joaquin River at Crows Landing Road, have been developed and include adjustments to account for extended dry periods. Potential impacts on water releases and storage at New Melones were also evaluated to insure that the proposed salinity objectives would not result in increased water being released from New Melones to meet the Vernalis electrical conductivity objectives. The primary management option that allows compliance with the proposed objectives is the completion of the Grasslands Bypass Project with monitoring and surveillance incorporated under the Real-Time Salinity Management Program. Regional Water Board personnel are currently working on the Staff Report which is expected to be completed in the first half of 2016.

Based on the Committee timeline, a Basin Plan Amendment proposing salinity water quality objectives and an implementation program for the LSJR is planned for Board consideration in late 2016.

The Technical Committee continues to provide technical review of CV-SALTS work products and technical recommendations where appropriate to support policy discussions or provide guidance on proposed approaches to projects. Three TAC Meetings were held in 2015, and addressed the following topics:

- Review draft SSALTS Phase 3 Report – Evaluate Potential Salt Disposal Alternatives to Identify Acceptable Alternatives for Implementation
- Draft Nitrate Implementation Measures Scope of Work
- Proposal to refine groundwater quality analysis for the Central Valley

Additionally, numerous Technical Project Committees, containing a subset of the Technical Advisory Committee members, were created to provide more detailed oversight of certain technical projects. Numerous meetings were held to support and provide direction on specific projects including SNMP development, Alta Irrigation District Management Zone project, and the NIMS project.

The Funding and Fundraising Committee worked intermittently on its two phase plan for fundraising. Phase 1 continues the addition of members and the increase in annual membership dues to support ongoing planning efforts and the development of matching funding for the planning efforts. During 2015, new members joined but offset members that did not renew, leaving the total membership at 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 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 and bond programs, the group continues to evaluate opportunities to develop new funding programs for salt and nitrate management at the State and Federal level.

Support from CVSC Members to apply for grants from existing programs at the State and federal levels continued. Efforts to plan to engage the help of legislators and agencies to develop new funding sources for the implementation plan that will be required for CV-SALTS will begin in 2016. CVSC Funding committee did not identify workable new funding areas in 2015, but expects to develop federal and other strategies as implementation plans are completed in 2016.

The main CV-SALTS web page was updated to clarify content and improve usability in 2013. Through 2015 updates and website maintenance have continued. The site is located at: <http://www.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 ensure technical information needed to support the initiative and a final basin plan amendment are completed on time and on budget. Beginning in summer 2014, the CVSC took over and continues to fund the Administrative Program Coordinator and the Technical Project Manager.

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 2016 – May 2016

- ✓ Complete Phase 2 Conceptual Model work, including technical sections of the SNMP and Alta Irrigation District Management Zone Project
- ✓ Complete updated groundwater quality analysis for the Central Valley
- ✓ Complete the Surveillance and Monitoring Program
- ✓ Complete the NIMS/SSALTS Projects with an implementation program for incorporation into the implementation section of the SNMP
- ✓ Initiate development of antidegradation analysis to support SNMP preparation
- ✓ Initiate economic review of alternatives for the SNMP
- ✓ Initiate CEQA Equivalent Documentation preparation for the SNMP
- ✓ Drafted CEQA and economic analyses for Phase 2 of the Ag Drain MUN Evaluation Archetype, specifically development of a process whereby the Board could evaluate and de-designate or refine where appropriate the MUN beneficial use in certain agriculturally-dominated waterbodies
- ✓ Complete draft Basin Plan Staff Report for the Tulare Lake Bed Groundwater MUN Evaluation Archetype
- ✓ Complete policy discussions and incorporation of these policies into the implementation section of the SNMP

June 2016 – December 2016

- ✓ Informational Workshop for Central Valley Board
- ✓ Complete economic review of alternatives
- ✓ Complete preparation of CEQA Equivalent Documentation
- ✓ Complete antidegradation analysis to support SNMP
- ✓ Finalize SNMP
- ✓ Tulare Lake Bed Groundwater MUN/AGR Evaluation Archetype Basin Plan Amendment for public comment and Central Valley Water Board consideration
- ✓ Phase 2 of the Ag Drain MUN evaluation archetype for Central Valley Water Board consideration
- ✓ Lower San Joaquin River Salt and Boron Water Quality Objectives

January 2017 – December 2017

- ✓ Develop Basin Plan Amendment to incorporate Central Valley SNMP

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.

In order to meet the activities and timelines identified above and in Figure 2, a contract modification will soon be submitted to update the contract budget.

CAA Funding	Resolution 2009-0023 (\$1.2-mil)				Total
	Obligated	Expended	Remaining	Projected FY15/16	
SJVDA Contract #09-076-150 (\$1.2-million)					
a. SJVDA Mgt. Services	\$82,262	\$81,003	\$1,259	\$1,259	\$82,262
b. BUOS Phase I	\$49,982	\$49,982			\$49,982
c. Program Mgt/Facilitation	\$742,756	\$742,747	\$9	\$9	\$742,756
<input type="checkbox"/> Strategy/Framework/Workplan Feb 2012					
<input type="checkbox"/> Facilitation of Policy Discussions					
<input type="checkbox"/> Outreach (website, brochure, workshops)					
d. Technical Support					
• Technical Project Management	\$111,915	\$111,915	\$0		\$111,915
<input type="checkbox"/> Framing Conceptual Model; finalize Salt Source guidance; Initial budget reviews					
• Long Term LSJR Committee Manager	\$213,085	\$183,688	\$29,397	\$29,397	\$213,085
Total :	\$1,200,000	\$1,169,335	\$30,664	\$30,664	\$1,200,000
Percent of \$1.2-million:	100%	97%	3%	100%	100%

*Work Products

% of Remaining

CAA Funding	Resolution 2010-0042 (\$3.8-mil)				Total
	Obligated	Expended	Remaining	Projected FY15/16	
SJVDA Contract #11-123-555 (\$3.8-million)					
a. SJVDA Mgt. Services	\$319,000	\$106,664	\$212,336	\$212,336	\$319,000
b. Technical Support					
• Technical Project Manager	\$296,086	\$296,086	\$0	\$0	\$296,086
*Scopes of work: Concept Model; BUOS II; AGR Zone; Groundwater MUN; LSJR wkpln					
• Basin Planning Support	\$104,776	\$104,776	\$0		\$104,776
<input type="checkbox"/> White Paper-Salinity Effects on MUN-Related Uses					
<input type="checkbox"/> White Paper-Salinity Effects on AGR-Related Uses					
• Interim LSJR Committee Manager	\$31,413	\$31,413	\$0	\$0	\$31,413
• LSJR Committee Manager (unallocated \$65,615)			\$0	\$0	\$0
c. Refine BUOS Phase II					
• Additional GIS Work	\$98,630	\$98,630	\$0		\$98,630
d. Conceptual Model (Three Phases)					
• Initial Conceptual Model Phase 1	\$472,007	\$472,007	\$0		\$472,007
Additional Data Support	\$22,000	\$22,000	\$0		\$22,000
e. Technical Studies					
<input type="checkbox"/> Aquatic Life Criteria Review	\$31,150	\$31,150	\$0		\$31,150
<input type="checkbox"/> Tulare Lake Bed GW MUN Archetype	\$100,000	\$51,246	\$48,754	\$48,754	\$100,000
<input type="checkbox"/> MUN POTW Archetype	\$199,868	\$45,620	\$154,248	\$154,248	\$199,868
*MUN POTW Water Analysis	\$43,535	\$43,535	\$0	\$0	\$43,535
<input type="checkbox"/> AGR Water Quality Zones	\$119,897	\$119,897	\$0		\$119,897
<input type="checkbox"/> Strategic Salt Accumulation Land and Transportation Study (SSALTS)	\$345,000	\$340,396	\$4,604	\$4,604	\$345,000
f. Technical Studies					
• Conceptual Model Phase 2:SNMP	\$575,000	\$526,550	\$48,450	\$48,450	\$575,000
* Work Plan					
* Assess sustainable salt/nitrate balanced					
* ID large scale MP's for evaluation					
* Incorporate Changes from Archetypes					
* Prepare CV SNMP Assessment					
* Review and Prepare Draft SNMP Document					
• Conceptual Model Phase 3:refine SNMP					
* Surveillance and Monitoring Plan	\$99,857	\$78,514	\$21,343	\$21,343	\$99,857
* Conduct Economic Analyses	\$271,169	\$0	\$271,169	\$271,169	\$271,169
* Perform Antidegradation Analysis	\$100,000	\$0	\$100,000	\$100,000	\$100,000
• Completion SSALTS Implementation Study					
* Nitrate Implementation Measures Study	\$99,995	\$55,737	\$44,258	\$44,258	\$99,995
g. CEQA Documentation	\$300,000	\$0	\$300,000	\$300,000	\$300,000
h. CV SNMP	\$104,997	\$0	\$104,997	\$104,997	\$104,997
Obligated to finalize Conceptual Model Phase 3 and CEQA Documentation	\$65,620		\$65,620	\$65,620	\$65,620
Total	\$3,800,000	\$2,424,222	\$1,375,778	\$1,375,778	\$3,800,000
Percent of 3.8 million:	100%	64%	36%	100%	100%

cent of Remaining

Obligated = subcontract approved and/or in progress

\$0

Table 2 CV-SALTS Stakeholder Contributions: 2008 - 2015 with Projections

As of 11/30/15

Stakeholder Contributions	Calendar Year							Projected 2016-17**	Projected Total
	2008-2009	2010	2011	2012	2013	2014	2015		
Contracted by CVSC									
Project Support	\$228,491	\$206,942	\$120,000	\$48,000	\$220,000	\$373,500	\$400,898	\$1,626,500	\$3,224,331
Technical Studies									
a. Salt Source Pilot Study	\$170,228	\$100,000	\$100,000	\$68,896					\$439,124
b. LWA Consultant Contribution		\$55,588							\$55,588
c. SNMP Section 8 unscoped							\$40,000	\$200,000	
Subtotal:	\$398,719	\$362,530	\$220,000	\$116,896	\$220,000	\$373,500	\$440,898	\$1,826,500	\$3,959,043
Specific Stakeholder Funded Projects									
Stock Watering Study				\$29,000					\$29,000
Ag Zone Water Quality Mapping									\$0
Tulare Groundwater Archetype				\$50,000	\$100,000	\$10,000	\$10,000	\$80,000	\$250,000
MUN POTW Archetype						\$33,000	\$33,000	\$33,000	\$99,000
AID Archetype Support								\$116,000	\$116,000
LSJRC Manager Support								\$20,400	\$20,400
Subtotal:	\$0	\$0	\$0	\$79,000	\$100,000	\$43,000	\$43,000	\$249,400	\$514,400
Treatment Alternatives									\$8,465,542
Support for Basin Planning Activities									\$3,400,386
Gathering Water Quality Information									\$6,204,328
Implementation Activities to Manage Salt and Nitrate									\$40,720,390
Ongoing Agency Efforts That Parallel and are Linked to CV-SALTS									\$13,200,000
Other Related Expenditures and efforts	\$7,139,265	\$7,104,000	\$7,104,000	\$11,617,606	\$4,737,500	\$4,737,500	\$4,737,500	\$4,737,500	\$51,914,871
Subtotal:	\$7,446,869	\$7,615,611	\$11,660,307	\$14,032,770	\$9,275,709	\$5,283,895	\$5,205,689	\$5,031,500	\$60,520,851
Total:	\$7,845,588	\$7,978,141	\$11,880,307	\$14,149,666	\$9,495,709	\$5,657,395	\$5,646,587	\$6,858,000	\$64,479,894

* Project details included in Table 4, Summary of 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	\$398,719	\$362,530	\$220,000	\$116,896	\$220,000	\$373,500
Other Stakeholder*	\$307,604	\$511,611	\$4,556,307	\$2,415,164	\$4,538,209	\$546,395
CAA Expended	\$0	\$63,706	\$389,129	\$930,774	\$1,076,543	\$441,722
CAA Projected						
Expended To Date	\$706,323	\$937,847	\$5,165,436	\$3,462,834	\$5,834,752	\$1,361,617
Cumulative	2009	2010	2011	2012	2013	2014
CVSC Funds	\$398,719	\$761,249	\$981,249	\$1,098,145	\$1,421,249	\$1,691,645
Other Stakeholder*	\$307,604	\$819,216	\$5,375,523	\$7,790,687	\$12,328,896	\$12,875,291
Total Stakeholder Expenditures	\$706,323	\$1,580,465	\$6,356,772	\$8,888,832	\$13,750,145	\$14,566,936
CAA Uncontracted	\$1,054,070	\$745,294	\$976,766	\$2,083,852	\$0.00	\$0.00
CAA Committed to Contracts	\$145,930	\$454,706	\$2,223,224	\$2,916,148	\$5,000,000	\$5,000,000
Expended To Date	\$706,323	\$1,644,171	\$6,809,607	\$10,272,441	\$16,107,193	\$17,468,810
Projected Expenditures						
% Stakeholder Expended Funds	100%	96%	93%	87%	85%	83%

* Other Stakeholder expenditures for this chart do not include Implementation Costs of \$38,764,871

Costs above do not include efforts required by RWQCB Permits

** Projected

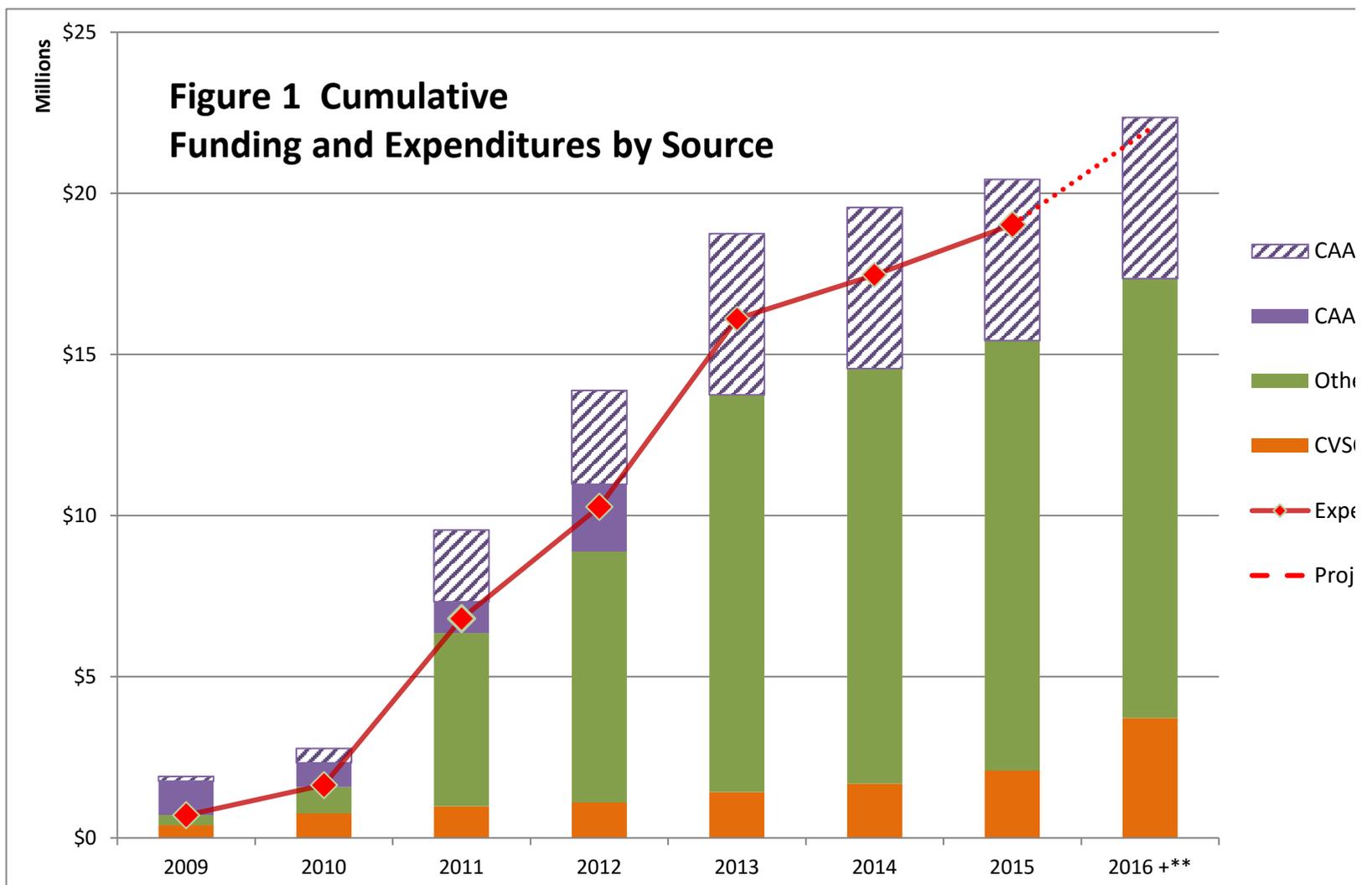


Table 4. Detailed Selected Stakeholder Contributions to Manage Central Valley Salt and Nitrate

11/30/2015

Table 4 Expands and provides further detail for the categories listed in Table 2

Type of Contribution	Agency	Project/Effort Name	Cost to Date		Total Projected 2015/16 +	Total Voluntary	Total All
			Voluntary	Permit Required			
Contributes to CV-SALTS by:							
Treatment Alternatives			\$7,564,913	\$206,440	\$694,189	\$8,259,102	\$8,465,542
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			\$62,588	\$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		\$240,000	\$280,800
	Receiving Water Study	Characterize Receiving water follow-on work from the WQM Study		\$57,988		\$0	\$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			\$150,000	\$150,000
	Pearl H2O 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			\$1,692,000	\$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			\$186,131	\$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			\$731,941	\$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			\$350,000	\$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			\$10,000	\$10,000
	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			\$30,000	\$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			\$115,000	\$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		\$500,000	\$1,700,000	\$1,700,000
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		\$0	\$63,064

Table 4. Detailed Selected Stakeholder Contributions to Manage Central Valley Salt and Nitrate

11/30/2015

Table 4 Expands and provides further detail for the categories listed in Table 2

Type of Contribution	Agency	Project/Effort Name	Cost to Date		Total Projected 2015/16 +	Total Voluntary	Total All
			Voluntary	Permit Required			
			Contributes to CV-SALTS by:				
		Source Evaluation Study		\$44,588		\$0	\$44,588
		Facilities and Staff Support for CV-SALTS	\$100,000		\$20,000	\$120,000	\$120,000
		Central Valley Clean Water Association					
		Salinity Toolbox for POTWs					
			\$44,050			\$44,050	\$44,050
		Food Processors/Wine					
		Low Salt Peeling Research and Development (FREP Grant)					
			\$900,000			\$900,000	\$900,000
		Wine Institute					
		Land application Study for Wineries					
			\$1,050,000			\$1,050,000	\$1,050,000
		Salinity and Energy Reduction Manual					
			\$250,000			\$250,000	\$250,000
		Coalition Urban Rural Environmental Stewardship (CURES)					
		Cost Efficient Nitrate BMP Development for Irrigated Agriculture (FREP Grant)					
			\$174,189		\$174,189	\$348,378	\$348,378
		Dairy Cares/Western United Dairymen					
		Animal Waste Pond Studies					
			\$279,014			\$279,014	\$279,014
		Support for Basin Planning Activities	\$1,953,500	\$13,886	\$1,433,000	\$3,386,500	\$3,400,386
		City of Vacaville					
		General Salinity Public Education and Outreach		\$13,886		\$0	\$13,886
		Central Valley Clean Water Association					
		Variance Basin Plan Amendment Assistance					
			\$129,744			\$129,744	\$129,744
		CV-SALTS Committee and Engagement Support					
			\$53,200		\$50,000	\$103,200	\$103,200
		Central Valley Salinity Coalition					
		Support for Administration Facilitation					
			\$1,082,844		\$1,308,000	\$2,390,844	\$2,390,844

Table 4. Detailed Selected Stakeholder Contributions to Manage Central Valley Salt and Nitrate

11/30/2015

Table 4 Expands and provides further detail for the categories listed in Table 2

Type of Contribution	Agency	Project/Effort Name	Cost to Date		Total Projected 2015/16 +	Total Voluntary	Total All
			Voluntary	Permit Required			
			Contributes to CV-SALTS by:				
		Pilot Salt and Nutrient Source Identification Study	\$519,712			\$519,712	\$519,712
		Dairy Cares/Western United Dairymen					
		Stock Water Quality Criteria Study (FREP Grant)	\$29,000			\$29,000	\$29,000
		Tulare Lake Drainage District					
		Committee Chair Support	\$50,000		\$25,000	\$75,000	\$75,000
		California Rice Commission					
		Consultant Participation and Support	\$54,000		\$50,000	\$104,000	\$104,000
		City of Dixon					
		Committee Chair Support	\$35,000			\$35,000	\$35,000
		Gathering Water Quality Information	\$3,173,000	\$2,803,121	\$228,207	\$3,401,207	\$6,204,328
		City of Vacaville					
		Household Self Regenerating Water Softener Study		\$61,391		\$0	\$61,391
		Conduct Electrical Conductivity Monitoring in Sanitary Sewer System		\$28,678		\$0	\$28,678
		Conduct Citywide Water Softener Survey		\$37,886		\$0	\$37,886
		Industrial User Monitoring of Source Water and Wastewater		\$17,856		\$0	\$17,856
		Major industrial users conduct Salinity Source Identification Studies		\$120,000		\$0	\$120,000
		US Bureau of Reclamation					
		West Side SJR Salt and Nutrient Source Study	\$425,000		\$150,000	\$575,000	\$575,000
		Ironhouse Sanitary District					
		Salinity Management Plan		\$37,310		\$0	\$37,310
		EKI Consultants					

Table 4. Detailed Selected Stakeholder Contributions to Manage Central Valley Salt and Nitrate

11/30/2015

Table 4 Expands and provides further detail for the categories listed in Table 2

Type of Contribution	Agency	Project/Effort Name	Cost to Date		Total Projected 2015/16 +	Total Voluntary	Total All
			Voluntary	Permit Required			
		Contributes to CV-SALTS by:					
		Turlock Salt Management Study	\$50,000			\$50,000	\$50,000
	LWA Team of Consultants						
		Value Added ICM Report Contribution	\$568,000			\$568,000	\$568,000
	Dairy Cares/Western United Dairymen						
		Representative Monitoring Program	\$2,130,000	\$2,500,000	\$78,207	\$2,208,207	\$4,708,207
		Implementation Activities to Manage Salt and Nitrate	\$32,490,086	\$4,230,304	\$4,000,000	\$36,490,086	\$40,720,390
	Grassland Area Farmers						
		San Joaquin River Improvement Project	\$16,921,215	\$4,230,304	\$4,000,000	\$20,921,215	\$25,151,519
		Grasslands Area Firebaugh Canal WD salinity reduction projects	\$9,545,000			\$9,545,000	\$9,545,000
	US Bureau of Reclamation						\$0
		Real Time Management Studies and efforts	\$725,000			\$725,000	\$725,000
	Tulare Lake Drainage District (TLDD)						\$0
		Spray Field (Enhanced Evaporation) project with Small Micron Nozzles (120) Acres	\$5,263,606			\$5,263,606	\$5,263,606
	Dairy Cares/Western United Dairymen						\$0
		California dairy industry-wide study of salinity sources and management practices	\$35,265			\$35,265	\$35,265
	Ongoing Agency Efforts That Parallel and are Linked to CV-SALTS		\$11,000,000	\$0	\$2,200,000	\$13,200,000	\$13,200,000
	CA Department of Water Resources						
		Agricultural Drainage Program	\$9,750,000		\$1,950,000	\$11,700,000	\$11,700,000
		San Joaquin River Real-time Water Quality Monitoring	\$1,250,000		\$250,000	\$1,500,000	\$1,500,000

Table 4. Detailed Selected Stakeholder Contributions to Manage Central Valley Salt and Nitrate

11/30/2015

Table 4 Expands and provides further detail for the categories listed in Table 2

Type of Contribution	Agency	Project/Effort Name	Cost to Date		Total	Total Voluntary	Total All
			Voluntary	Permit Required	Projected 2015/16 +		
Contributes to CV-SALTS by:							
Total Voluntary Contributions, Regulatory Required and Agency Efforts:			\$56,181,499	\$7,253,751	\$8,555,396	\$64,736,895	\$71,990,646

Figure 2 - Summarized CV-SALTS Workplan Schedule

Revised 1/15/16

Draft SNMP To Regional Board → → Final SNMP → BPA →

CV-SALTS Program Element	2011	2012	2013	2014	2015	2016	2017	2018	+
Program Management									
Technical Studies									
Archetypes/Case Studies									
Groundwater MUN (Tulare)									
Surface Water MUN (Sac Valley POTWs)									
Management Practice Development									
Lower San Joaquin River Salt and Boron Objectives									
Implementation Planning									
Documentation for Approval									
CEQA Equivalent Documentation									
BPA Documentation Process Support									
Initial Implementation									
Monitoring and Reporting									
Phase II SNMP									

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 and completed in December 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 (completed in January 2014). This project builds off the findings of the ICM to begin development of a draft SNMP for the Central Valley. Scope of work elements include targeted refinements to the project database, 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 was initiated in April 2014; completion expected in spring of 2016.

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 (antidegradation and economics) and

preparation of documentation to support adoption of the SNMP into the Basin Plan. Status: Project is planned for initiation and completion in 2016.

Updated Groundwater Quality Analysis for the Central Valley – CV-SALTS has initiated a project to update the groundwater quality analysis originally conducted as part of the ICM. The project deliverables include (a) high resolution ambient groundwater quality maps (nitrate and TDS) for the Central Valley for three defined zones: upper, lower, and production zones; and (b) high resolution assimilative capacity maps (nitrate and TDS) for the Central Valley (upper, lower, and production zones). The deliverables will be incorporated into the technical sections of the developing SNMP. Status: Project initiated in December 2015 and scheduled for completion in March 2016.

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 and completed October 2013.

GIS Services – Agricultural Zone Mapping - CV-SALTS implemented 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 incorporated into the CV-SALTS geodatabase included agricultural-related jurisdictional boundaries, soil characteristics, irrigation supply sources, water quality, historic and current cropping patterns, as well as other relevant data. These data layers were 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 was originally planned to occur in two phases. Phase 1 was authorized in 2013, but Phase 2 authorization was deferred, pending the findings of the Phase 1 work. Phase 1 deliverables included (a) developing agricultural-related data and preparing appropriate GIS map layers; (b) identifying up to 25 CSZs for the Central Valley; and (c) conducting a workshop with the agricultural community to discuss project findings. The need for

a second phase for this project has not yet been determined by CV-SALTS. Status: Phase 1 project was implemented February 2013 and was completed in April 2014.

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. In portions of this same area the AGR use also may not be applicable. 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 and AGR 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 beneficial uses on a groundwater body. Status: Project initiated in September 2012; completion expected in 2016.

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. This project has two phases: (1) Phase 1 evaluated the appropriateness of the MUN beneficial use designation in four case study areas - the agriculturally dominated receiving waters of four Publically Owned Treatment Works (POTWs - Cities of Willows, Colusa, Biggs and Live Oak). The outcome was an approved Basin Plan amendment to remove MUN from the receiving waters of each POTW. (2) Under Phase 2, the Board is developing amendments to the Basin Plans that would specify a process whereby the Board could evaluate and de-designate or refine (where appropriate) the MUN beneficial use in certain agriculturally-dominated waterbodies. Status: Project initiated in the latter part of 2011; Phase 1 completed in 2015; Phase 2 planned for completion in 2016.

Water Quality Objectives Review

Aquatic Life Study - CV-SALTS implemented 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 researched 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 provided technical recommendations for adoption of salinity-related water quality objectives to protect aquatic life. Status: Project initiated in December 2012; completed in January 2014.

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 will be prepared as part of SNMP development.

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; A final White Paper will be prepared as part of SNMP development.

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. Phase 1, which focused on an evaluation of current salt disposal practices at selected study areas, was completed in December 2013. Phase 2, which concentrates on the development of potential future salt disposal/treatment alternatives for the Central Valley, was completed in September 2014. Phase 3 is evaluating the potential salt disposal/treatment alternatives identified in Phase 2 to develop implementation measures and a phased implementation strategy for inclusion in the SNMP. Status: A draft Phase 3 report was completed in spring 2015; the Phase 3 report will be finalized in coordination with the CV-SALTS Nitrate Implementation Measures Study in spring 2016.

Surveillance & Monitoring Program - The purpose of this project is to develop a Surveillance & Monitoring Program (SAMP) that will allow for statistically-defensible ambient water quality determinations and completion of trend analyses. The SAMP, which will be incorporated into the Central Valley Salt and Nitrate Management Plan, is being designed to fulfill the monitoring requirements of the planned Basin Plan amendments that will be adopted to support implementation of the SNMP. Status: Project was initiated in March 2015 and is planned for completion in spring 2016.

Nitrate Implementation Measures Study (NIMS) - CV-SALTS is implementing a study to evaluate nitrate contamination in the groundwater basins of the Central Valley and develop

appropriate implementation measures to mitigate this contamination using a phased approach that includes providing safe drinking water, reducing or eliminating impacts to drinking water sources and implementing managed restoration activities where needed to restore beneficial uses in groundwater. The implementation measures, which will be incorporated into the SNMP, will be phased and a prioritization methodology will be used to rank groundwater basins in order of priority – where risk reduction from nitrate in groundwater is optimized to facilitate use of the limited resources available. Findings from NIMS will be evaluated along with SSALTS findings to develop a coordinated salt and nitrate management program for incorporation into the SNMP. Status: This project is planned for completion in spring 2016.

CEQA Substitute Environmental Document (SED) - CV-SALTS will prepare the SED and CEQA Checklist to support the SNMP and expected subsequent Basin Plan amendments. This project will be closely coordinated with the antidegradation and economic analyses to be developed to support the SNMP (see Phase 3 Conceptual Model). First step in all three projects is the establishment of a project description for analysis and identification of baseline conditions to be used as the basis for regulatory analyses. Once these elements are established, environmental and economic analyses will be completed. Status: Project is planned for initiation and completion in 2016.