CV-SALTS Executive Committee Meeting
Thursday, June 20, 2019 – 10:00 AM to 4:00 PM - Sunset Maple Room
Sacramento Regional Sanitation District
10060 Goethe Rd, Sacramento 95827

Teleconference (712) 770-5505  Code: 279295#
Go-To-Meeting Link:  https://global.gotomeeting.com/join/545551597
Posted 6-11-19 – Revised 06-19-19

1) Welcome and Introductions – Chair – (15 mins)
a) Committee Roll Call and Membership Roster
b) Review and Approve May 23, 2019 Meeting Notes

2) Basin Plan Amendments – State Board Consideration Schedule – Patrick, Anne (45 mins)
   – State Board adoption update

3) Update on Management Zones – Richard Meyerhoff, Parry Klassen, Charlotte Gallock (60 mins)
   – Preliminary Draft of Early Action Plan
   – Upcoming Steering Committee Meetings
     ▪ Turlock MZ: July 29, 1:30-4:00, Turlock Irrigation District
     ▪ Kings River East GSA/AID Area MZ: July 30, 1:00-4:00, Dinuba Parks & Recreation Multi-Purpose Room

12:00 am to 1:30 pm - Lunch

4) P&O Study Work Plan Update and Revisions – Richard Meyerhoff, Joe LeClaire, Tom Grovhoug (1hr 30 mins.)
   – Review and Discuss Sections 1 – 4
     o Provide written comments no later than COB Monday, July 8, 2019

5) State Board Workshop Presentation – All (20 mins.)
   – Presentation Outline, Workgroup & Panel Participants

6) P&O Study Implementation Fees – Daniel Cozad (15 mins.)
   – Presentation of the approved fee structure

7) PEOC Update – Nicole Bell (15 mins.)
   – Update on Outreach Matrix - Outreach Tracking <- Link Only
   – Draft Press Release
   – Approve P&O Fact Sheet - “Central Valley Salinity Management: De-Designated Areas”
   – Revised CV-Salts PowerPoint Presentation <- Link Only

8) Review Meeting Schedule/Location – (10 mins)
   – SWRCB CV-Salts Public Workshop: July 2, 2019, 9:30 a.m. – CalEPA Bldg. 1001 I Street
   – No Executive Committee Meeting Scheduled for July
   – Policy Meeting: August 15, 2019, 9:00 – 3:00 @ Regional San

CV-SALTS meetings are held in compliance with the Bagley-Keene Open Meeting Act set forth in Government Code sections 11120-11132 (§ 11121(d). The public is entitled to have access to the records of the body which are posted at http://www.cvsalinity.org

One or more Central Valley Regional Water Quality Board members may attend.
## CV-SALTS Committee Rosters

### Executive Committee Membership

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**CV Salinity Coalition**

| 1      | So. San Joaquin WQC                         | Nicole Bell       | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 2      | City of Stockton                            | Deedee Antypas    | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 3      | California Cotton Growers                   | Chris McGlothlin  | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 4      | City of Fresno                              | Rosa Lau-Stagg    | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 5      | CA Leaque of Food Processors                | Trudi Hughes      | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| Alt    | CA Leaque of Food Processors                | Rob Neenan        | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 6      | NCWA/SVWQC                                 | Bruce Houdesheldt | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 7      | City of Tracy                               | Stephanie Hiestand| ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| Alt    | City of Tracy                               | Dale Klever       | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 8      | Sacramento Regional CSD                     | Rebecca Franklin  | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| Alt    | Sacramento Regional CSD                     | Sam Safi          | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 9      | San Joaquin Tributaries Authority           | Dennis Westcot    | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 10     | Valley Water Management                     | Melissa Thorne    | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| Alt    | Valley Water Management                     | Jason Meadors     | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 11     | California Rice Commission                  | Tim Johnson       | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 12     | City of Davis                              | Josie Tellers     | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 13     | Tulare Lake Drainage District              | Mike Nordstrom    | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 14     | Western Plant Health Assoc.                 | Renee Pinel       | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 15     | City of Vacaville                          | Mindy Boele       | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| Alt    | City of Vacaville                          | Justen Cole       | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 16     | Dairy Cares                                | J.P. Cativiela    | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| Alt    | Dairy Cares                                |                  | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 17     | Westlands Water District                   | Debra Dunn        | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| Alt    | Westlands Water District                   | Kit Campbell      | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |

### Comm. Chairs/Co-chairs

<p>| 1      | Chair Executive Committee                  | Parry Klassen, ESJWQC | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 2      | Vice Chair Executive Committee             | Debbie Webster CVWA  | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 3      | Technical Advisory Committee               | Roger Reynolds, S Engr. | ✔   | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
|        | Technical Advisory Committee               | Nigel Quinn, LBL     | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 4      | Public Education and Outreach              | Nicole Bell          | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |
| 5      | Economic and Social Cost Committee         | David Cory, SJVDA    | ✔     | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      | ✔      |</p>
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ADDITIONAL PARTICIPANTS:
DISCUSSION ITEMS

1) Welcome and Introductions
   a) Executive Committee Chair, Parry Klassen, brought the meeting to order, and roll call was completed.
   b) David Cory moved, and Rob Neenan seconded, and by general acclamation the April 25, 2019, Meeting Action Notes were approved.

2) Basin Plan Amendments – State Board Consideration Schedule
   - Patrick Pulupa provided an update on the CV-SALTS Amendment. The State Board has set tentative dates for the CV-SALTS Amendment. The Public Workshop is tentatively scheduled for July 3, 2019, followed by a Hearing on August 20, 2019. Briefings for Board members have gone extremely well. The final two briefings are scheduled for Tuesday, May 28th. The Notice of Public Workshop should be out by Friday, May 31, 2019.

3) State Board Presentation Outline
   - Tess Dunham presented a draft outline for the Public Workshop presentation. Tess will work further with Patrick Pulupa and Anne Littlejohn to refine the structure and details of the presentation. Some of the suggestions from the committee:
     • Keep the overview/introduction very brief, 3-5 minutes.
     • Concentrate on areas of controversy.
     • Two key points to add to the presentation:
       o Early Action Plans – what are they, what do they look like, expectations for...
       o Enforceability – how will the Regional Board ensure commitments are met?
     • Under Other Policies & Actions – mention only SMCLs and Drought and Conservation, move Conditional Discharge Prohibition and Offsets to the Nitrate Control Program section.

4) Update on Management Zones
   - Parry Klassen and Charlotte Gallock provided an update on the Management Zone Pilot projects for Turlock and Kings River. Both Management Zone Pilots are drafting Early Action Plans and conducting active outreach to dischargers. Efforts to resolve issues related to the placement of drinking water kiosks/fill stations are ongoing. Both projects are scheduled to meet the second week of June, (Turlock 6/12, AID/Kings 6/13).
     • The committee requested Daniel Cozad develop a pre-notification letter to permit holders. The letter would be distributed after adoption, but before the January implementation date. The letter/postcard would advise the permit holders they will be receiving the formal Notice to Comply in January.

5) P&O Study Work Plan Update and Revisions
   - Tom Grovhoug provided the anticipated timeline for completion of the work plan. A discussion on the draft of the four main tasks in the work plan is scheduled for the June Meeting. Cost and schedule information will be discussed in August, followed by a finalization of the whole package in the Fall of 2019. The committee discussed the latest draft piece of the workplan, Establishment of Appropriate Numeric Salt Management Targets – Targets to Protect AGR use.
6) **PEOC Update**
   - Nicole Bell provided an update on Outreach activities. The committee was asked to review and provide comments within one week on the following Outreach items:
     - The latest version of the general CV-SALTS PowerPoint presentation used at the recent ACWA Conference and Almond Board meeting.

7) **Review Next Meetings - Schedule/Location**
   - Policy Meeting: June 20, 2019, 9:00 – 3:00 @ Regional San
   - **No Executive Committee Meeting Scheduled for July**
   - Policy Meeting: August 15, 2019, 9:00 – 3:00 @ Regional San
1. Background and Purpose

The Nitrate Control Program established by the Central Valley Water Quality Control Board (Central Valley Water Board) provides two pathways for compliance for permitted discharges to groundwater. Pathway A is for individual permittees and sets conservative limitations for source control. Pathway B is for permittees proposing to be regulated under a Management Zone. Both Pathways require the development of an Early Action Plan (EAP) defined as a plan that identifies specific activities, and a schedule for implementing those activities, that will be undertaken to ensure immediate access to safe drinking water for those who are dependent on groundwater from wells that exceed the primary maximum contaminant level (MCL) for nitrate (10 mg/L nitrate as nitrogen). While these wells are primarily domestic wells, this EAP also addresses areas where public water supply wells have nitrate levels exceeding the water quality objective.

1.1 Early Action Plan Requirements

An EAP must include the following, unless otherwise approved by the Central Valley Water Board’s Executive Officer:

i. A process to identify affected residents and the outreach utilized to ensure that impacted groundwater users are informed of and given the opportunity to participate in the development of proposed solutions;

ii. A process for coordinating with others that are not dischargers to address drinking water issues, which must include consideration of coordinating with affected communities, domestic well users and their representatives, the State Water Board’s Division of Drinking Water, Local Planning Departments, Local County Health Officials, Sustainable Groundwater Management Agencies and others as appropriate;

iii. Specific actions and a schedule of implementation that is as short as practicable to address the immediate drinking water needs of those initially identified within the management zone, or area of contribution for a Path A discharger, that are drinking groundwater that exceeds nitrate standards and that do not otherwise have interim replacement water that meets drinking water standards; and

iv. A funding mechanism for implementing the Early Action Plan, which may include seeking funding from Management Zone participants, and/or local, state and federal funds that are available for such purposes;

For participants in a Management Zone, the EAP is submitted to the Central Valley Water Board with the submittal of a Preliminary Management Zone Proposal. Implementation of
the EAP shall begin as soon as is reasonably feasible, but no later than 60 days after submittal, unless the Central Valley Water Board deems the EAP to be incomplete.

1.2 EAP Framework

1.2.1 Workflow

Figure 1-1 provides an overview of the key work elements included in this EAP: Identification of residents potentially impacted by nitrates in their drinking water source (see Section 4), outreach activities to the general public in the Management Zone and identified residents within the area covered by the EAP (see Section 6) and development of temporary alternative drinking water sources (see Section 6). These work elements will be coordinated with non-dischargers within the Management Zone (see Section 3) and activities will be documented through data management and reporting activities.

1.2.2 Area of Applicability

This EAP applies to the area within Turlock Management Zone boundary where nitrate in the upper zone of the underlying groundwater is expected to exceed the nitrate water quality objective (Figure 1-2 – Figure showing MZ Boundary and area within the boundary to which the EAP applies). Section 2 provides the basis for how this area was determined.

1.2.3 Participants

This EAP will be implemented by all declared participants of the Turlock Management Zone. A participant is an individual discharger subject to Waste Discharge Requirements or dischargers that are part of a third-party group subject to a General Order that have filed a Notice of Intent to the Central Valley Water Board documenting that they have opted to comply with the Nitrate Control Program through Path B, i.e., participation in a Management Zone. The participants of this Management Zone are named in the Preliminary Management Zone Proposal.

1.3 Community Outreach to Develop EAP Approach

Placeholder - To be developed, expected content to include:

- Process to develop EAP, including stakeholder participation
- Community outreach activities to receive public comments
- Summary of how community comments were addressed
1.4 EAP Effective Date

The effective date of this EAP is *within 60 days of submittal date for Preliminary Management Proposal*, unless the Central Valley Water Board issues a formal objection. This EAP will remain in effect until it is superseded by the requirements established in the approved Management Zone Implementation Plan established for this Management Zone.
Figure 1-1. Workflow Elements of Early Action Plan
2. Identification of Potentially Impacted Groundwater Users

Placeholder – This information is being developed by Luhdorff & Scalmanini and will be inserted before June 12 meeting.

2.1 Nitrate-impacted Areas

2.2 Public Water Supply Sources

2.2.1 Public Water Supply Systems

2.2.2 State Small Water Systems

2.2.3 Local Small Water Systems

2.3 Potentially-Impacted Domestic Wells
3. **Existing Safe Drinking Water Programs Serving Management Zone Area**

*Placeholder - This section will describe existing programs/efforts to provide safe drinking water to residences within the area covered by the EAP.*
4. Process to Identify Potentially Affected Residents

Section 2 identified the geographic areas within the Management Zone that have the potential for the underlying upper zone groundwater to have nitrate levels exceeding the water quality objective. The EAP targets these areas for identification of potentially affected residents, i.e., residents that may be using this groundwater as a drinking water source. The sections below provide the methodology to identify these residents. Section 6 below describes how the EAP will conduct outreach to these residents.

The following process will be implemented to identify potential residences within the Management Zone that may have a domestic well, or be connected to a public water supply system, that is providing water that has nitrates that exceed the nitrate water quality objective. The process described only identifies residences that may be drinking contaminated water. This information will be used to conduct outreach to ensure that residents are aware of the options within this Management Zone for obtaining non-contaminated water.

Step 1: Data Development

*Figure 2-X [map illustrating area with nitrate exceeding the water quality objective]* above serves as the baseline map for the use of mapping tools to develop a preliminary list of residences within the Management Zone boundary. In general, the water quality data and water system boundaries will be overlaid on Google Earth images to begin the process of identifying residences within the area. The resulting mapped area will be subdivided and analyzed at an appropriate scale using a grid overlay (grid size will depend on the resolution needed to identify residences; but no greater than a 2 x 3-mile grid is anticipated).

Within each grid, residential properties will be located using Google Earth satellite images. County parcel shapefile data (with assessor parcel numbers [APN]) will be requested from Stanislaus and Merced Counties. This shapefile will be overlaid on the gridded Google Earth image to associate land parcels with each residential property.

Step 2: Establish List of Potentially Affected Residences

The location of public water supply systems (public water systems, local small water systems, state small water systems) will be identified within the area of analysis. Each of these systems will be evaluated for compliance with the nitrate water quality objective. Residences served by a compliant water system will be removed from the list of potential residences. If any system is determined to be non-compliant with the nitrate water quality objective, those residents within that water system will remain on the list.
Using the data developed in Step 1, a grid by grid analysis will be completed to identify parcels with potentially affected residences. All parcels and associated property ownership and addresses will be compiled in a spreadsheet for subsequent analysis. The spreadsheet will be screened to identify residences that are identified as members of a Coalition under the Irrigated Lands Regulatory Program (ILRP). These residences will be removed from the spreadsheet because outreach to these residents regarding the EAP will occur through the ILRP program.

The final list of potentially affected residents (mailing list) will be divided into owner-occupied and tenant-occupied residences. Owner-occupied residences are those that have the same physical and mailing address, whereas tenant-occupied residences have different physical and mailing addresses. The resulting mailing list will be used as described below in Section 6.
5. Process to Coordinate with Non-Dischargers

Placeholder to address the following EAP requirement: A process for coordinating with others that are not dischargers to address drinking water issues, which must include consideration of coordinating with affected communities, domestic well users and their representatives, the State Water Board’s Division of Drinking Water, Local Planning Departments, Local County Health Officials, Sustainable Groundwater Management Agencies and others as appropriate.

5.1 Identification of Non-Dischargers

Placeholder for list

5.2 Coordination Activities

Placeholder to discuss: (a) current participation by non-dischargers; and (b) future outreach and coordination under this EAP.

This section of the EAP describes the specific actions planned within the Management Zone to provide access to sources of safe drinking water for residents who are dependent on groundwater from wells that supply water that exceeds the nitrate water quality objective. These actions are considered temporary but will remain available until permanent sources of safe drinking water become available within the Management Zone area. The specifics actions that will be implemented to provide permanent sources of drinking water will be identified in the Management Zone Implementation Plan that will be developed within six months after the Central Valley Water Board issues its formal approval of the formation of this Management Zone (after submittal of the Final Management Zone Proposal).

6.1 Temporary Sources of Drinking Water

Both primary and secondary sources of safe drinking water will be provided to residents within the area of the Management Zone that the EAP applies (see Section 1.2.2 for area of applicability). Primary sources are those that are available to all residents in the area. A secondary source of drinking water is provided to residents who are unable to access the primary drinking water source; this source is only available to residents that meet specific applicability criteria.

6.1.1 Primary Source: Water Kiosks

Water kiosks will serve as the primary source of safe drinking water for residents in the area covered by this EAP. A water kiosk is an independent water-dispensing facility connected directly to a water source that meets safe drinking water standards and is constructed and operated as required by state and federal regulations. The facility will be made available to area residents at no cost. The following sections describe the Water Kiosk Program that will be implemented under this EAP.

6.1.1.1 Initial Criteria to Identify Areas for Water Kiosk Development

The Turlock Management Zone will establish up to eight water kiosks within the Management Zone. The actual number depends on where it is possible to establish an operational kiosk, especially given that the installation and operation of a kiosk depends on the cooperation and agreement with a land or property owner.

The initial basis for selection of these targeted locations was to establish kiosks with minimal non-overlapping areas that are no greater than 10 miles in diameter. Figure 6-1 illustrates the initial areas, showing the centroid of each of the areas targeted for installation of a kiosk.
(example to be illustrated during Management Zone meeting). Each of the targeted locations is in general: (a) relatively rural; and (b) in areas not served by an existing public water supply or state/local small water system. In addition, the targeted areas also encompass all disadvantaged communities (DAC) or unincorporated communities (DUC) within the Management Zone.

Based on this initial evaluation and using the ten-mile diameter criterion, the areas within the Management Zone impacted by high nitrate concentrations can be covered by as few as seven kiosks. However, the actual number of kiosks established in the area will depend on the Management Zone’s ability to find locations that meet the selection criteria below, especially securing permission from land/property owners to install a water kiosk and having the ability to connect the kiosk to viable safe drinking water source. It is known that finding acceptable locations for installation of a kiosk will be challenging due to concerns regarding liability and safety issues. Therefore, it may be necessary to reconfigure the targeted locations and/or modify the diameter of the areas served as currently shown in Figure 6-1.

### 6.1.1.2 Final Criteria to Establish Water Kiosk Locations

The following criteria will be applied to the maximum extent possible to each of the targeted areas to identify a final location for water kiosk installation:

- Permission to install and operate a kiosk on land or property owned by a third party can be secured.
- Source of water to the kiosk meets safe drinking water regulations.
- Source of water to the kiosk has sufficient capacity to dispense water at a reasonable rate to fill up multiple containers (up to five-gallons) within a short period of time (target of 1.5-2 gallons/minute, consistent with California regulations for faucets in new residential construction).
- Establishment of kiosk is not expected to create any safety issues.
- Vehicle access/parking is available, sufficient to not cause any unnecessary congestion.
- Location is available for public access at least six days/week, except during state-observed holidays.
- Operational hours are at least 8 am until 7 pm.
- INSERT Other...?

### 6.1.1.3 Facility Requirements

Kiosk design, construction and operation and maintenance (O&M) requirements will be consistent with state and federal regulations. If available, the Management Zone may use the specifications from other approved water kiosks in the Central Valley Region as a template for

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1 The potential targeted locations for kiosks described or illustrated in this document are conceptual for planning purposes. Actual locations as well as the size of the diameter of the area to be served may be modified as further information regarding water supplies and available properties for siting a kiosk are identified.
the design and implementation of kiosks established under this EAP [INSERT example if available]. The water kiosk will be metered in to track usage.

6.1.1.4 Water Kiosk Implementation Approach

Once implementation of the EAP begins, the following process will be implemented to finalize locations for kiosks and implement the process to install and operate the kiosks (see Section 7 for schedule of implementation):

- Identify final locations for installation of a water kiosk:
  - Identify potential landowners/property owners (any entity with a proprietary interest in the land upon which the kiosk will be installed) within each targeted area consistent with the selection criteria. This list will be prioritized for implementation and land/property owners will be contacted to initiate discussions regarding installation of a kiosk with the goal of identifying a land/property owner willing to enter into an agreement to install a kiosk on their property.
  - Establish any necessary agreements to formalize use of the land as location for installation of a water kiosk.
  - If no land/property owner can be identified in the targeted location, an alternative location for the water kiosk will be developed taking into account the locations of other established or planned kiosks within the EAP area.

- Prepare the appropriate documentation (e.g., kiosk design, installation/construction documents, operational procedures, O&M requirements, approvals/agreements, etc.) for the water kiosk.

- Submit the water kiosk documentation to the California Division of Drinking Water (DDW) for approval.

- Construct/install the water kiosk, as approved by DDW.

- Establish agreements/contracts as needed to ensure appropriate O&M occurs at the facility

- Provide notice to the community within the Management Zone and the Central Valley Water Board that the kiosk is operational.

Throughout the kiosk development and installation process, status updates and outreach on the progress of the water kiosk program will continue through regular Management Zone activities.

6.1.2 Secondary Source: Alternative Water Delivery

For residents that are unable to use one of the water kiosks established within the Management Zone area, alternative water delivery will be provided if specific criteria are met. The Alternative Water Delivery Program within this Management Zone will consist of providing bottled water to residences approved to receive delivery per the requirements below (Note: this text may be modified to include Point of Use (POU) systems as well as there may be a need to identify more...
than one alternative water delivery option. Therefore, keep in mind during review that references to bottled water as an alternative water source may also include a POU system).

6.1.2.1 Qualifications

Bottled water may be delivered to residences that are unable to access a kiosk. Acceptable reasons may include medical disability, age-related conditions, lack of mobility or lack of transportation. Any resident located within the area covered by this EAP within the Turlock Management Zone may apply to receive bottled water. A request to participate in an Alternative Water Delivery Program may be made by submitting a completed application to the Management Zone governing body (see Attachment A – to be developed). The Management Zone reserves the right to confirm that obtaining water from a water kiosk is not a viable option for the applicant; however, no personal or medical information is required to be submitted as part of the application. All applicants must meet the following minimum criteria:

- Applicant does not receive drinking water from a public water supply system where state- and/or county-mandated testing indicates the public water supply system complies with nitrate standards.

- Current drinking water source at the applicant’s residence contains nitrate concentrations above the drinking water standard of 10 mg/L (nitrate measured as nitrogen). If appropriate data to assess this criterion are not available, the applicant will request that their water source be tested at no cost to them.

- Applicant is not receiving or is not eligible for alternative water delivery through another existing program.

- If bottled water delivery is provided by a third-party bottled water provider and the provider requires the applicant to sign an agreement to receive the bottled water, the applicant must be willing to sign the agreement and meet the bottled water provider agreement’s terms and conditions.

Along with a completed application, the applicant for bottled water delivery will include the following supporting documentation:

- Proof of residency within the area encompassed by this EAP. Proof of residency requires two different documents consistent with the requirements to provide proof of California’s Real ID program. Visit https://www.dmv.ca.gov/portal/dmv/detail/realid to see requirements to demonstrate California residency. See the fact sheet provided on the website linked below for a list of acceptable documents to demonstrate residency.

- Recent (within last 2 years) water quality test data from the drinking water source at the applicant’s residence. If the drinking water source has not been tested or the data are not

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2 https://www.dmv.ca.gov/portal/wcm/connect/2db22455-e270-47a3-819c-d7c7716d5194/List_of_Docs_REALID.pdf?MOD=AIPERES&CVID=
recent, the applicant may request that the Management Zone test the water at no cost to the applicant. In this instance, the applicant will check the appropriate box on the application and the Management Zone will contact the resident to arrange to have the water tested.

6.1.2.2 Implementation Approach

The sections below provide information on how the Management Zone will implement the Alternative Water Delivery Program.

General Public Outreach to the Management Zone

The Management Zone will provide public notice of the availability of safe drinking water for residents within the area covered by the EAP within 30 days after the following events:

- When the first water kiosk is operational within the area;
- When 33% or more of the kiosks are operational within the area;
- When 67% or more of the kiosks are operational within the area; and
- When all water kiosks planned for implementation under this EAP are operational within the Management Zone.

Public notice may be accomplished through direct mail, notices in the newspaper, on relevant websites (e.g., Management Zone, Water Quality Coalitions, County, Central Valley Water Board, or others as appropriate). Each public notice will be prepared in English and Spanish and include direct information or links to information about the following:

- Management Zone and EAP, including why the elevated nitrate is a potential health concern;
- Locations of operational kiosks (at the time the public notice is released) and information regarding use;
- Alternative Water Delivery Program, including criteria to participate and how to apply; and
- Program representatives or website to contact to obtain more information.

Direct Outreach to Residents in Areas with Nitrate Exceeding the Water Quality Objective

The Management Zone will develop a packet of materials for mailout to the residences identified under Section 4. This packet, which will provide information in both English and Spanish, will only be mailed once. This mailed packet will include the following:

- Cover letter that explains the EAP and how its implementation may apply to their residence;
- Educational pamphlet regarding nitrate in drinking water as a potential health concern;
- Identify locations of water kiosks within the area covered by the EAP;
- Describe the Alternative Water Delivery Program: (a) criteria to participate; (b) information regarding how to apply and what the resident needs to do to have their well tested, if that is
necessary to complete the application; and (c) an application that may be mailed or submitted online; and

- Program representatives or website to contact to obtain more information.

The outreach packet will be sent via regular mail to each residence on the final mailing list. The process to develop this mailing list is discussed above in Section 4.

Responding to Applicants for Alternative Water Delivery Program

Once an application is received, the Management Zone will complete the following processing activities:

- Review the application for completeness and confirm that the applicant qualifies for the Program (contact with the applicant will be made in English or Spanish, as appropriate):
  - If the application indicates that the applicant’s drinking water source needs to be tested for nitrate, the resident will be contacted to schedule sampling of the well by a representative of the Management Zone. Sample collection and laboratory analysis will follow standard State-approved methods.
  - If necessary based on the information in the application, the Management Zone may contact the applicant to confirm that obtaining water from a water kiosk is not a viable option for the applicant.

- Prepare a response to each applicant:
  - Approved applicants for the Alternative Water Delivery Program will receive a letter of confirmation from the Management Zone that includes: (a) statement that they are approved for alternative water delivery; (b) information regarding how alternative water service will be initiated, and (c) the amount of water delivery approved for the residence (based on the information provided in the application regarding the number of people in the household at the applicant’s address). If the Management Zone tested the applicant’s water for nitrate, the letter will also include a copy and explanation of the sample results.
  - If a resident’s application to participate in the Alternative Water Delivery Program is denied, the applicant will receive a letter of denial from the Management Zone that states the reason for why the application was denied. If the reason for denial is because the applicant’s drinking water has nitrate concentration below the water quality objective, the letter will include a copy and explanation of the sample results. The letter will include steps that may be taken by the applicant to appeal the decision, if it is believed that an error has been made in the decision.

Establish Alternative Water Delivery Provider

The Management Zone will select one or more vendors to provide bottled water to approved applicants. Agreements will be established as needed to ensure that bottle-water delivery service remains uninterrupted either until the EAP is no longer being implemented or the applicant
begins to receive drinking water from a source that complies with the nitrate water quality objective.

**Long-term Management**
Approximately three months after initiation of an Alternative Water Delivery Program to a residence, the Management Zone will contact the recipient to ensure the amount of water being provided is sufficient or is not in excess of the needs of the household. Throughout EAP implementation, the Management Zone will have staff available to answer questions or address concerns from residents participating in the program.

**Data Management**
The Management Zone will maintain records that document the following information:

- Master list of residences to which an outreach packet was mailed to and the number of packets returned as undeliverable.
- For applications received, the number of drinking water testing requests received, number of drinking water sources tested and associated test results, and numbers of letters of confirmation or denial sent out.
- For letters of confirmation, the number of residents that established agreements with the selected bottled water provider.
- For letters of denial, the number of residences that appealed the denial and the resolution of each appeal.

**6.2 Reporting**
As provided for in the implementation schedule (Section 7), the Management Zone will prepare periodic reports to document progress and status of implementation of the Water Kiosk and Alternative Water Delivery Programs. At a minimum, these reports will include information regarding participation in each program, water quality sample results, total number of gallons received from each water kiosk, volume of water delivered by alternative mechanism, expenditures during the reporting period and anticipated costs for the next reporting period.
7. Early Action Plan Implementation

7.1 Schedule/Milestones

Table 7-1 provides the schedule and milestones for the implementation of the EAP. This schedule is based on the implementation approach provided in the above sections. If it is necessary to modify the schedule or milestones, the Management Zone will submit a letter to the Executive Officer of the Central Valley Water Board documenting the requested modification, the reason(s) for the request and a proposed new schedule and/or milestones.

7.2 Roles and Responsibilities

Placeholder - to be determined

7.3 Funding

7.3.1 Program Cost

Preliminary assessment planned for meeting

7.3.2 Program Allocation

Placeholder - to be determined

7.3.3 Funding Mechanism

Placeholder - to be determined
## Table 7-1. EAP Implementation Schedule

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<tr>
<th>EAP Element</th>
<th>Task</th>
<th>Schedule/Milestones</th>
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<tr>
<td>Resident Identification</td>
<td>Identify residences in area covered by EAP and develop mailing list</td>
<td>Within 120 days of EAP effective date</td>
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<td>to support outreach</td>
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<td>Outreach General Public</td>
<td>Develop public notice mechanisms and materials</td>
<td>Within 120 days of EAP effective date</td>
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<td>Deliver public notice of EAP Implementation</td>
<td>Within 30 days of the following milestones:</td>
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<td>• When the first water kiosk is operational within the area</td>
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<td>• When 33% or more of the kiosks are operational within the area</td>
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<td>• When 67% or more of the kiosks are operational within the area</td>
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<td>• When all water kiosks planned for implementation in this EAP are operational</td>
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<td>within the area</td>
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<td>Targeted to Specific Residents</td>
<td>Develop outreach packet for residential delivery</td>
<td>Within 120 days of EAP effective date</td>
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<td>Mail outreach packet</td>
<td>Within 30 days prior to first kiosk becoming operational</td>
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<td>Drinking water tests</td>
<td>Conduct tests within 30 days of request</td>
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<td>Issue all letters of confirmation or denial</td>
<td>Issue letter within 30 days of application if no water test required; within 60 days</td>
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<td></td>
<td>Resolve all appeals to letters of denial</td>
<td>Complete review within 60 days of receipt of communication requesting review of</td>
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<td>Temporary Water Delivery</td>
<td>Establish list of potential land/properties for locating a kiosk</td>
<td>Within 30 days of EAP effective date</td>
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<td>Program Establish Kiosks</td>
<td>within targeted areas</td>
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<td>Establish final list of locations for kiosk development</td>
<td>Identify all kiosk locations within 90 days of EAP effective date</td>
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<td>Complete documentation necessary to seek approval to construct</td>
<td>Submit water kiosk documentation to DDW for approval per the following milestones:</td>
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<td></td>
<td>kiosk and submit to DDW for review</td>
<td>• Kiosks 1 &amp; 2: within 180 days of EAP effective date</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Kiosks 3, 4, 5 &amp; 6: within 1 year of EAP effective date</td>
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<td></td>
<td></td>
<td>• Kiosks 7 &amp; 8 (if needed) within 1.25 years of EAP effective date</td>
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<td></td>
<td></td>
<td>• If more than 8 kiosks are needed, documentation for remaining kiosks will be</td>
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<td></td>
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<td>submitted within 1.5 years of EAP effective date</td>
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<td></td>
<td>Construct kiosks</td>
<td>Initiate installation of each DDW-approved kiosk within 90 days of approval</td>
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<td>Establish agreements to operate/maintain kiosks</td>
<td>Complete for each kiosk prior to the date kiosk becomes operational</td>
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<tr>
<td></td>
<td>Notify Central Valley Water Board when kiosks are operational</td>
<td>Within 30 days of kiosk becoming operational</td>
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<tr>
<td></td>
<td>Notify community of water kiosk operational status</td>
<td>See EAP public notice requirements above.</td>
</tr>
<tr>
<td>EAP Element</td>
<td>Task</td>
<td>Schedule/Milestones</td>
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<tr>
<td>Temporary Water Delivery Program</td>
<td>Establish agreement with alternative water provider</td>
<td>Within 30 days of mailout of outreach packet to residences</td>
</tr>
<tr>
<td></td>
<td>Follow-up with residents receiving delivery of water via alternative means</td>
<td>Check in with each residence within 90 days after initiation efforts to provide alternative water delivery to the residence</td>
</tr>
<tr>
<td>Data Management &amp; Reporting</td>
<td>Records management</td>
<td>Compile data in a timely manner to support preparation of EAP Reports</td>
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|                                 | Submit EAP Status Reports to Management Zone Participants and Central Valley | Submit status reports within 30 days of the following:  
  - Six-months after the EAP effective date  
  - 1 year after the EAP effective date  
  - Annually after the Year 1 report until the EAP is no longer effective |
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<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>1,2,3-TCP</td>
<td>1,2,3-trichloropropane</td>
</tr>
<tr>
<td>AC</td>
<td>Assimilative capacity</td>
</tr>
<tr>
<td>AFY</td>
<td>Acre feet per year</td>
</tr>
<tr>
<td>ASR</td>
<td>aquifer storage and recovery</td>
</tr>
<tr>
<td>AWQ</td>
<td>Ambient water quality</td>
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<td>Water Quality Control Plans for the Sacramento River and San Joaquin River Basins and the Tulare Lake Basin</td>
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<td>best management practices</td>
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<td>Basin Plan Amendment</td>
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<td>CECs</td>
<td>Constituents of Emerging Concern</td>
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<td>California Environmental Data Exchange Network</td>
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<td>Central Valley Salinity Alternatives for Long-term Sustainability</td>
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<td>California Water Code</td>
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<td>California Department of Water Resources</td>
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<td>EBMUD</td>
<td>East Bay Municipal Utilities District</td>
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<td>EC</td>
<td>electrical conductivity</td>
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<td>GAMA</td>
<td>Groundwater Ambient Monitoring and Assessment</td>
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<td>Initial Conceptual Model</td>
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<td>IEBL</td>
<td>Inland Empire Brine Line</td>
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<td>Irrigated Lands Regulatory Program</td>
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<td>LID</td>
<td>low-impact development</td>
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<td>Managed Aquifer Recharge</td>
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<tr>
<td>MEP</td>
<td>Maximum Extent Practicable</td>
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<td>MF</td>
<td>Membrane filtration</td>
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<td>million gallons per day</td>
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<td>mg/L</td>
<td>milligrams per liter</td>
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<td>Description</td>
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<td>MOA</td>
<td>Memorandum of Agreement</td>
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<td>Notice to Comply</td>
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<td>oil and gas</td>
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<td>Office of Administrative Law</td>
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<td>OWOW</td>
<td>One Water / One Watershed</td>
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<td>PFOA</td>
<td>perfluorooctanoic acid</td>
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<td>PFOS</td>
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<tr>
<td>RDBMS</td>
<td>relational database management system</td>
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<tr>
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<td>Reverse osmosis</td>
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<td>total dissolved solids</td>
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<td>Technical Program Manager</td>
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<td>Technical Review Panel</td>
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<td>UCI</td>
<td>Underground Injection Control</td>
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<td>Wastewater Treatment Plant</td>
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<td>ZLD</td>
<td>Zero liquid discharge</td>
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1.0 Background and Purpose

1.1 Central Valley Salt Control Program

The Central Valley Regional Water Quality Control Board (Central Valley Water Board) adopted Amendments to the Water Quality Control Plans for the Sacramento River and San Joaquin River Basins and the Tulare Lake Basin to Incorporate a Central Valley-wide Salt and Nitrate Control Program (Basin Plans) (Resolution R5-2018-0034) on May 31, 2018 (Central Valley Water Board 2018). The State Water Resources Control Board (State Water Board) and the Office of Administrative Law (OAL) approved these amendments to the Central Valley Water Board Basin Plans (Central Valley Water Board 2015, 2016a) on ________ (Resolution ____ ) and ________ (OAL Matter Number: __________), respectively. The groundwater elements of these Basin Plan amendments (BPA) became effective following OAL approval. Surface water elements will become effective upon approval by the United States Environmental Protection Agency (USEPA). The following sections, excerpted from the BPAs, provide a high-level summary of the Salt Control Program. Appendix A provides the complete Salt Control Program BPA language excerpted from R5-2018-0034.

1.1.1 Program Overview

Based on the Central Valley Salt and Nitrate Management Plan (SNMP) and its supporting studies (Central Valley Water Board 2017), salt concentrations in some surface waters and groundwaters continue to increase over time under existing water quality management programs and strategies to control salt. Given these findings, the SNMP identified the need for the implementation of a salt management strategy with the following goals:

■ Control the rate of degradation through a “managed degradation” program;

■ Protect beneficial uses by applying appropriate antidegradation requirements for high quality waters;

■ Implement salinity management activities to achieve long-term sustainability and prevent continued impacts to salt sensitive areas; and

■ Protect beneficial uses by maintaining water quality that meets applicable water quality objectives and pursuing long-term managed restoration where reasonable, feasible and practicable.

The SNMP’s supporting studies evaluated local salt management options in areas with significant salt concerns. These evaluations demonstrated that the volume and mass of

1 The Central Valley SNMP was accepted by Central Valley Water Board Resolution R5-2017-0031 on March 9, 2017.
unmanaged salt would remain high in those areas even under scenarios where existing salt management tools are widely adopted. It was determined that a comprehensive approach to the salinity issues in the Central Valley Region\(^2\) was required and additional studies were still needed to further define the range of cost-effective projects for surface water and groundwater that may be deployed within each hydrologic region within the Central Valley Region to prevent continued impacts to salt sensitive areas.

Given these findings, the Central Valley Water Board adopted a phased Salt Control Program consistent with the goals of the SNMP’s salt management strategy. This strategy requires all permitted salt discharges to comply with the provisions of the Salt Control Program through one of two compliance pathways in the near term:

1. **Conservative Salinity Permitting Approach** - Utilizes the existing regulatory structure of the Basin Plans and focuses on source control, use of conservative salinity limits, and limited use of assimilative capacity and/or compliance time schedules.

2. **Alternative Salinity Permitting Approach** – Establishes an alternative approach to compliance through implementation of specific requirements, rather than application of conservative salinity limits. Permittees that select this compliance pathway under the Salt Control Program must commit to supporting the Phase I Prioritization and Optimization Study (P&O Study).

The Salt Control Program will be initiated by the issuance of a Notice to Comply (NTC) to permitted dischargers in the region under the jurisdiction of the Central Valley Water Board. This NTC will be sent to permittees with permitted discharges within one year of the effective date of the Salt Control Program. Once this NTC is received, each permitted discharger must select one of the two permitting approaches.

### 1.1.2 Program Phases

The Salt Control Program will be implemented in three phases, with each of the phases having an estimated duration of ten to fifteen years. **Figure 1-1** illustrates the three-phased program and associated permitting approaches. As shown in this figure, (a) the activities under each phase are linked to the Alternative Salinity Permitting Approach; and (b) the findings from each phase inform the next phase, allowing for implementation of an adaptive approach to salt management in the entire Central Valley. The Executive Officer of the Central Valley Water Board has the discretion to modify or extend the completion date for any phase of the Salt Control Program without a basin plan amendment. **Figure 1-2** describes each of the Program phases as stated in the Salt Control Program regulation (R5-2018-0034, Attachment 1, pages 8 and 10).

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\(^2\) Central Valley Region refers to the entire area under the jurisdiction of the Central Valley Water Board.
Figure 1-1. Phased Salt Control Program Pathways to Compliance (Figure S-1 in Attachment 1 to Central Valley Water Board Resolution No. R5-2018-0034)
**Figure 1-2 Phased Salt Control Program (see pages 8 and 10, Central Valley Water Board Resolution No. R5-2018-0034)**

**Phase I – Prioritization and Optimization Study**

The P&O Study will facilitate the development of a long-term Salt Control Program to achieve the goals of the SNMP’s salinity management strategy by coordinating and completing tasks and securing funding. The P&O Study will:

- Develop groundwater and surface water-related salinity data and information for sensitive and non-sensitive areas for hydrologic regions within the entire Central Valley Region, including guidelines to protect salt-sensitive crops;
- Identify sources of salinity and actions that impact salinity in surface water and groundwater;
- Evaluate impacts of state and federal policies and programs;
- Identify and prioritize preferred physical projects for long-term salt management (e.g. regulated brine line(s), salt sinks, regional/sub-regional de-salters, recharge areas, deep well injection, etc.);
- Develop the conceptual design of preferred physical projects and assess the environmental permitting requirements and costs associated with each of these projects;
- Identify non-physical projects and plan for implementation;
- Develop a governance structure and funding plan;
- Identify funding programs, including federal and state funds, and opportunities for future phase implementation; and
- Identify recommendations for Phase II of the Salt Control Program.

The P&O Study will inform Phases II and III of the Salt Control Program. Based on the findings of the P&O Study, the Central Valley Water Board will review the Basin Plans and consider whether modifications to the Basin Plans are required to facilitate implementation of Phases II or III.

**Phase II – Project Development and Acquisition of Funds**

Phase II of this Salt Control Program will begin no later than at the end of Phase I, but some activities may be initiated during Phase I. Phase II includes the following key elements:

- Using available funding sources, complete the engineering design and environmental permitting of preferred physical projects identified in Phase I;
- Initiate or continue implementation of preferred non-physical projects identified during Phase I and, if appropriate, identify new preferred non-physical projects and the process or milestones for implementation; and
- Identify sources and secure the funding to implement the preferred physical projects.

**Phase III – Project Implementation**

Complete construction of preferred physical projects unless already completed during Phase II. For large-scale capital projects, such as construction of a regulated brine line, construction may occur over multiple phases and additional time may be required to complete full build-out of the project.
1.2 Phase I Salt Control Program

1.2.1 P&O Study Implementation

In 2006, the Central Valley Water Board established Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS), a collaborative stakeholder effort to develop the Central Valley SNMP. The Central Valley Salinity Coalition (CVSC) was formed in 2008 to integrate and augment the efforts of the CV-SALTS initiative, including governing and organizing the efforts needed to plan, develop and implement the SNMP for the Central Valley Region. In accordance with this role, the CVSC is the lead entity overseeing the implementation of the P&O Study. Permittees that select the Alternative Salinity Permitting Approach are required to support the P&O Study, including providing the minimum required level of financial support. The necessary level of participation to satisfy this requirement is determined by the CVSC.

Table 1-1 summarizes the key milestones to be completed during Phase I over a 10-year period. Figure 1-3 provides a general illustration of this schedule. The first milestone in the P&O Study schedule is the submittal of a Phase I Workplan to the Central Valley Water Board Executive Officer for approval within six months from the issuance of the NTC to permitted dischargers. The purpose of the Workplan is to provide a detailed description, estimated cost and specific schedule of P&O Study tasks to be completed over the 10-year duration of Phase I. Development of this Workplan was guided by the milestones described in the Salt Control Program.

1.2.2 Phase I Workplan Development

In 2017, the Kings River Watershed Coalition Authority (KRWCA) received a State Grant to facilitate salt and nitrate management (State Water Board Resolution No. 2017-0061). Implementation of the grant, which KWRCA implemented in partnership with CV-SALTS, supported early implementation of Central Valley Region salt and nitrate management strategies, including development of the P&O Study Workplan. Workplan development relied on the following key sources of information:

- CV-SALTS Executive Committee - input and discussion during regular committee meetings.
- Central Valley Region Salt Control Program incorporated into the Basin Plans (Central Valley Water Board 2018).
- Central Valley Region SNMP (Central Valley Water Board 2017), which was supported by numerous technical studies and findings from CV-SALTS policy discussions (see SNMP Section 4.2.5 for an overview and Table 4-3 for a list of supporting technical studies).
<table>
<thead>
<tr>
<th>Implementation Schedule</th>
<th>Milestone/ Deliverable</th>
<th>Minimum Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months from NTC</td>
<td>Phase I Workplan</td>
<td>Workplan to include:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Detailed P&amp;O Study task descriptions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cost estimate for each task</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Task completion schedule</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stakeholder participation elements</td>
</tr>
<tr>
<td>Within 12 months from NTC</td>
<td>Phase I Funding &amp; Governance Plan</td>
<td>Complete Phase I implementation planning:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Establish the entity and procedures for governance of the P&amp;O Study</td>
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<td></td>
<td>• Secure sufficient funding to complete the P&amp;O Study</td>
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<tr>
<td>Per Workplan</td>
<td>Special Studies</td>
<td>Special Studies to include:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Groundwater Quality Trace Constituent Study</td>
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<td></td>
<td></td>
<td>• Recycled Water Imports Study</td>
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<td></td>
<td></td>
<td>• Stormwater Recharge Master Plan Study</td>
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<tr>
<td></td>
<td></td>
<td>• Emerging Technical Updates (every 5 years)</td>
</tr>
<tr>
<td>12 months from Workplan approval and periodically thereafter</td>
<td>After Years 1, 5 and 10</td>
<td>Progress Report to summarize:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Progress on Workplan execution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Status of Phase I funding and expenditures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Stakeholder participation</td>
</tr>
<tr>
<td>5 years from NTC</td>
<td>Interim Project Report</td>
<td>By Central Valley Hydrologic Region, identify:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recommended preferred physical projects with recommended next steps for development</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Recommended non-physical projects and a schedule for implementation</td>
</tr>
<tr>
<td>9 years from NTC</td>
<td>Long-term Governance Plan for Phases II and III</td>
<td>Governance Plan that establishes:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Describes planned implementation approach for Phases II &amp; III</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Governance structure including: (a) stakeholder’s roles and responsibilities; and (b) committees responsible for development of policies, technical documents, BMPs and funding</td>
</tr>
<tr>
<td>9 years from NTC</td>
<td>Long-term Funding Plan for Phases II and III</td>
<td>Funding Plan that establishes:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Financial approach for long-term funding including sources and funding types (grants, bonds, loans, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Approach for the equitable management and funding of long-term, large-scale salinity management projects</td>
</tr>
<tr>
<td>9 years from NTC</td>
<td>Basin Plan Amendment Recommendations</td>
<td>As needed, recommended amendments to Basin Plans to:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Facilitate implementation of Phase II of the Salt Control Program</td>
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<tr>
<td></td>
<td></td>
<td>• Consider extension of salinity variance and revision of salinity exception policies</td>
</tr>
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<td></td>
<td></td>
<td>• As appropriate, modify the Salinity Permitting Approaches;</td>
</tr>
<tr>
<td>10 years from NTC</td>
<td>Final Phase I Report</td>
<td>• For preferred physical projects: (a) conceptual designs; and (b) assessment of environmental permitting requirements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Status of implementation of non-physical projects per Interim Project Report with recommendations for modifications, as needed</td>
</tr>
</tbody>
</table>
Figure 1-3. General Schedule of Key Phase I P&O Study Activities and Milestones (Figure S-2 in the Salt Control Program; see Attachment 1 to Central Valley Water Board Resolution No. R5-2018-0034)

<table>
<thead>
<tr>
<th>Category</th>
<th>Year of Implementation (From NTC)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Stakeholder Coordination</td>
<td></td>
</tr>
<tr>
<td>Stakeholder Coordination Meetings</td>
<td></td>
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<tr>
<td>Sustainable Groundwater Management Act (SGMA)</td>
<td></td>
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<tr>
<td>Groundwater Sustainability Agency (GSA)</td>
<td></td>
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<tr>
<td>Coordination Meetings (as needed frequency)</td>
<td></td>
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<tr>
<td>Phase I Workplan</td>
<td></td>
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<tr>
<td>Phase I Workplan</td>
<td></td>
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<tr>
<td>Governance</td>
<td></td>
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<tr>
<td>Phase I Governance Plan</td>
<td></td>
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<tr>
<td>Long-term Governance Plan</td>
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<tr>
<td>Funding</td>
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<tr>
<td>Phase I Funding Plan</td>
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<tr>
<td>Long-term Funding Plan</td>
<td></td>
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<tr>
<td>Preferred Physical/Non-Physical Salt</td>
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<tr>
<td>Management Projects</td>
<td></td>
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<tr>
<td>Development of Recommended Preferred Physical</td>
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<tr>
<td>and Non-Physical Projects</td>
<td></td>
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<tr>
<td>Interim Project Report</td>
<td></td>
</tr>
<tr>
<td>Conceptual Design and Assessment of</td>
<td></td>
</tr>
<tr>
<td>Environmental Permitting Requirements for</td>
<td></td>
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<tr>
<td>Preferred Physical Projects</td>
<td></td>
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<tr>
<td>Final Project Report</td>
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<tr>
<td>Special Studies</td>
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<tr>
<td>Groundwater Quality Trace Constituent Study</td>
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<tr>
<td>Recycled Water Study</td>
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<tr>
<td>Stormwater Recharge Master Plan Study</td>
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<tr>
<td>Emerging Tech Update No. 1</td>
<td></td>
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<tr>
<td>Emerging Tech Update No. 2</td>
<td></td>
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<tr>
<td>Basin Planning</td>
<td></td>
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<tr>
<td>Phase II Recommendations</td>
<td></td>
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<tr>
<td>Annual Reports</td>
<td></td>
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<tr>
<td>Progress Reports of Key Milestones (Years 1, 5</td>
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<tr>
<td>and 10 with documentation (electronic or</td>
<td></td>
</tr>
<tr>
<td>otherwise) of participation)</td>
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</tr>
</tbody>
</table>
- Central Valley Salinity Management Strategy (SNMP Attachment A-3), which was developed through extensive policy discussions with the CV-SALTS Executive Committee and stakeholders (Central Valley Water Board 2017).

- Strategic Salt Accumulation Land and Transportation Study (SSALTS), which, through a series of phased reports, documented the magnitude of the salt problem in the Central Valley Floor, evaluated technologies and tools currently available to manage salt, and developed and analyzed potential alternatives for achieving salt sustainability in groundwater on a preliminary basis (CV-SALTS 2013a, 2014a, 2016).

The CV-SALTS Executive Committee provided comments on drafts of this Workplan. A final draft Workplan was submitted to KRWCA and CV-SALTS [INSERT DATE] 2019. This final draft was further refined by the CV-SALTS Executive Committee and submitted to the Executive Officer of the Central Valley Water Board for approval on [INSERT DATE].
2.0 Workplan Approach

2.1 Conceptual Approach

The purpose of the Phase I P&O Study is to facilitate the development of a long-term Salt Control Program to achieve the goals of the SNMP’s salinity management strategy in the Central Valley Region. **Figure 2-1** illustrates the conceptual approach envisioned by this Workplan to achieve the intended Phase I P&O Study outcome.

![Conceptual Approach Diagram](Image)

**Figure 2-1. Conceptual Approach to Develop a Long-term Salt Control Program for the Central Valley Region**

In general, the P&O Study will work through a stakeholder process to develop preferred salt management strategies tailored to defined Salt Management Regions (SMRs) in the Central Valley Region. Implementation of the strategies in Phase II will be conducted locally, as needed, and collaboratively across SMRs, where appropriate. Development and implementation of these salt management strategies will be supported where necessary by the establishment of appropriate regulations and policies, development of tools and salt management practices, reliance on previous work completed in the area, e.g., through development of the Initial Conceptual Model (ICM) to support the Central Valley SNMP CV-SALTS 2013b) or technical work to support GSAs, and findings from special studies to be completed under this Workplan.
Table 1-1 provided the formal, required milestones that are to be completed through implementation of this Workplan to demonstrate progress during Phase I of the Salt Control Program. Figure 1-3 illustrated the general alignment between P&O Study activities and the 10-year duration of the Study. These Study activities may be categorized into the following key Workplan elements:

■ Element 1: Stakeholder Coordination;
■ Element 2: Programmatic Activities;
■ Element 3: Non-Physical Projects; and
■ Element 4: Salt Management Strategy Development and Identification of Physical Projects

For the purposes of this Workplan, we define the terms “non-physical” and “physical” as follows:

■ **Non-Physical Projects** – Projects or activities that involve the evaluation or development of alternative management programs, techniques, policies, regulations, guidelines, tools, or other tasks that lead to technical understanding or procedures that facilitate the collective management of water and salt. The range of potential deliverables in this area is broad, including but not limited to recommendations for changes in current policies or regulations, development of new or revisions to existing management practices, completion of special studies (e.g., economics or technologies) to provide information to support development of salt management strategy alternatives, development of tools or procedures to facilitate selection of salt management strategies, e.g., development of optimization tools or numerical surface water and groundwater models that will help to determine whether the Salt Control Program goals and objectives are being achieved.

■ **Physical Projects** – Projects requiring construction of infrastructure, including, e.g., treatment works, storage or disposal facilities, well construction, pipelines, transportation facilities, etc. Physical projects may be local to address specific salt management needs or may be sub-regional or regional serving multiple SMRs. At the end of Phase I, physical projects incorporated into a salt management strategy for an SMR will include a conceptual design (equivalent to approximately a 10 percent engineering design), an assessment of the what will be required to permit the project (e.g., CEQA/NEPA, Porter-Cologne, Endangered Species Act, other requirements), and at least initial discussion on implementation requirements for projects requiring significant interagency collaboration.

### 2.2 Key Workplan Elements

This section provides a more detailed description of the components of each of the Workplan elements, including the inter-relationships of these elements. Section 3 below provides a tabular summary of the task/sub-tasks, deliverables, schedule and estimated costs to
implement each of the Workplan elements. Section 4 provides detailed information to support the summary provided in Section 3.

2.2.1 **Element 1: Stakeholder Coordination**

Stakeholder coordination will be tailored to the needs of the P&O Study. First, a formal stakeholder process will be implemented throughout the duration of the P&O Study under Workplan Task 1. This process will include regular Executive Committee meetings to provide a forum and mechanism for stakeholder participation to: (a) provide direction for the P&O Study (policy and technical); (b) discuss administrative needs (planning and financial); (c) conduct report outs on Workplan activities; and (d) discuss findings from task deliverables. Stakeholder coordination will also need to occur with other agencies or stakeholder groups with interests in water and salt management, e.g., Central Valley and State Water Board staffs, GSAs and others. Some of this coordination may occur through the implementation of specific tasks. Finally, significant coordination with local stakeholders within SMRs will be necessary at key points in the process to receive local input on the development of water quality targets and long-term salt management approaches for specific areas.

2.2.2 **Element 2: Programmatic Activities**

Workplan Task 2 addresses programmatic activities that support implementation of the Phase I Workplan and develop deliverables necessary to facilitate implementation of Phase II. Consistent with requirements of the BPA (see Table 1-1 above), Figure 2-2 illustrates the relationship among programmatic activities and the stakeholder process over the anticipated 10-year duration of the P&O Study. Programmatic activities include:

- **P&O Study Management** – The administrative and technical management of the Study will occur under this activity. A Technical Program Manager (TPM) will work collaboratively with the CV-SALTS Executive Committee\(^3\) and stakeholders to oversee the day to day implementation of the Workplan, coordinate with the Study’s Technical Advisory Committee (TAC), and support regular stakeholder meetings.

- **Funding Plan** – The Workplan includes tasks for (a) development and implementation of a Phase I Funding Plan to provide revenue for the implementation of the Phase I P&O Study; and (b) development of a Funding Plan for implementation of Phases II and III.

- **Governance Plan** - The Workplan includes tasks for (a) development of a Phase I Governance Plan to guide implementation of the Phase I P&O Study; and (b) development of a Governance Plan for implementation of Phases II and III.

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\(^3\) For the purposes of this Workplan, it is assumed that implementation of the P&O Study will occur in a forum that is the same as or functionally equivalent to the existing CV-SALTS Executive Committee process.
- **Reporting** – Three program status reports will be completed, at the end of Years 1, 5, and 10. All three reports will report on the progress of Workplan execution. The Year 5 and Year 10 Reports will also satisfy the BPA requirement for preparation of Interim and Final Project Reports, respectively.

- **Basin Plan Recommendations** – The Workplan includes a task to develop recommendations by the end of Year 9 to facilitate implementation of Phase II. These recommendations may require a BPA to modify the adopted Salt Control Program.

![Diagram](image)

**Figure 2-2. Illustration of the Alignment of Programmatic Activities within the P&O Study 10-Year Program (see also Table 1-1).**

### 2.2.3 Element 3: Non-Physical Projects

The non-physical element of the Workplan includes a range of projects and activities that are intended to ensure that (a) appropriate regulations and policies are in place to manage salt effectively in the Central Valley Region; and (b) necessary tools and technical information are available to support the development and evaluation of salt management strategies for the Central Valley and SMRs. Accordingly, non-physical projects are needed to support not only...
the overall goals of the Salt Control Program, but also support other specific Workplan elements. Task 3 of this Workplan identifies non-physical projects anticipated to be necessary at this time; additional projects may be identified during implementation of the Workplan. The adaptative management element associated with the preparation of P&O Study status reports provides the opportunity to update the Workplan to incorporate additional non-physical projects.

The Workplan schedules the implementation of non-physical projects to ensure projects are completed when needed. For example, a key non-physical project in this Workplan is establishing what the range of appropriate numeric salt targets should be throughout the Central Valley Region. This range of targets must be clearly defined before it can be determined what is necessary to achieve salt sustainability in defined SMRs.

2.2.4 Element 4: Salt Management Strategy Development and Identification of Physical Projects

The purpose of this element is to work through a stepwise technical evaluation process that considers regional, sub-regional and local approaches to reduce the impacts from salt within defined SMRs. The evaluation process will develop alternatives to achieve salt sustainability, based on appropriate salt management targets, evaluate alternatives based on those targets, and select a preferred salt management strategy that includes preferred projects for implementation in Phases II and III. The preferred projects, which are expected to include a combination of physical and non-physical projects within specific SMRs, may include collaboration on projects with other SMRs.

Figure 2-3 illustrates the key steps in the development, evaluation, and selection of physical projects for inclusion in a preferred salt management alternative for each SMR. A brief summary of each of these steps is described below. Workplan Task 4 provides the details regarding the specific tasks to complete these steps.

**Step 1: Develop Salt Management Regions**

This step considers the Central Valley Region as an entire system and describes factors that influence water and salt transport within the region. Within that context, this step will seek to subdivide the Central Valley Region into manageable units for analysis. The purpose for developing SMRs is to focus subsequent salt analyses and decisions into manageable units, where interrelationships between salt and existing water management practices are more closely linked. SMRs may be as large as an entire river basin, e.g., the Sacramento River basin or consist of smaller hydrologic areas, e.g., subareas within the San Joaquin River basin.

**Step 2: Characterize the “Salt Problem” in the Central Valley Region and in Each SMR**

Within the Central Valley Region, the gap between salt load reductions currently being achieved and what is necessary to achieve sustainability is the salt problem to be resolved.
Definition of the salt problem is necessary to develop a range of alternatives for reducing salt loads to achieve sustainability within SMRs, considering various opportunities and constraints. It may not be possible in some instances to simply export the salt out of the SMR, because it may create a new problem in the area where the salt is planned for export. Using existing work already completed in the Region (e.g., through development of CV-SALTS ICM project, CV-SALTS 2013b) and data analysis tools, four key activities will occur during this step:

- Assess salinity-related quality of surface water and groundwater;
- Identify and quantify sources of salt loading and salt transport and evaluate impacts from these processes;
- Evaluate benefits expected from existing or planned salt minimization activities/projects; and
- Quantify the salt problem, i.e., how much does the salt load to an SMR need to be reduced to achieve long-term sustainability?

The non-physical project element of this Workplan includes tasks to develop tools or conduct special studies, where needed, to support the analyses to be completed during this step.

Figure 2-3. Steps to Identify, Evaluate and Select a Salt Management Alternative for Implementation in SMRs in Phases II and III of the Salt Control Program
Step 3: Develop Salt Management Strategy Alternatives Appropriate for Each SMR

The purpose of this step is to develop strategies for achieving sustainability within each SMR. These strategies will be set up as alternatives for analysis under Step 4. Strategies to reduce salt loads may be local, regional, or basin-wide, e.g.:

- Local projects tailored for implementation within an individual SMR; or
- Development of sub-regional or regional projects that would be implemented collaboratively between two or more SMRs.

Development of these strategies must be coordinated with the non-physical project element of this Workplan (see Section 2.2.3 above). For example, to be able to develop a strategy, it will first be necessary to have tools and criteria to evaluate alternative strategies, to determine a range of applicable salt targets for the SMR, etc. Strategies may rely solely on non-physical projects, physical projects or may include a combination of physical and non-physical projects.

The degree to which physical projects are included in salt management strategies will depend on the needed salt load reduction in an SMR and the reductions that can be achieved solely through the implementation of non-physical projects. Where physical projects are needed, identification of these projects will include those that can be implemented within the SMR or be implemented as joint projects between two or more SMRs.

Salt management alternatives for each SMR will be included in the Phase I Interim Report required for submittal to the Central Valley Water Board at the end of Year 5 of the P&O Study.

Step 4: Evaluate Salt Management Strategy Alternatives Appropriate for Each SMR

This step focuses on the evaluation and ranking of potential salt management alternatives developed for the various SMRs. Stakeholders will provide input into the development of criteria to evaluate these alternatives. The non-physical project element of this Workplan includes development of tools, e.g., optimization or decision criteria tools, to support the evaluation of alternatives.

Step 5: Select a Preferred Salt Management Strategy Alternative for Each SMR

The outcome of this step is a preferred salt management strategy for each SMR. As noted above, the selected preferred strategy may include collaboration among SMRs on the implementation of physical and non-physical projects that provide regional or basin-wide benefits (Figure 2-4). The combination of physical and non-physical projects constitutes the project portfolio for the SMR.
**Step 6: Finalize Preferred Salt Management Alternative and Establish Phase II SMR Implementation Plan**

The outcome of this step will be a Phase II Implementation Plan for each SMR that includes (a) existing and already planned salt management projects; (b) non-physical projects still planned for implementation; and (c) conceptual designs for any physical projects planned for development in Phases II and III; and (d) anticipated schedule and estimated cost for implementation. The Phase I Final Report required for submittal to the Central Valley Water Board at the end of Year 10 of the P&O Study will include the Phase II Implementation Plans for each SMR.

![Figure 2-4. Conceptual Illustration of a Preferred Salt Management Alternative for Each SMR for Implementation in Phase II](image-url)

**Figure 2-4. Conceptual Illustration of a Preferred Salt Management Alternative for Each SMR for Implementation in Phase II**
3.0 Workplan Summary

This section provides a Workplan overview, including the anticipated organizational structure for implementation of the P&O Study Workplan and tabular summaries of the key tasks, deliverables, schedule and estimated costs associated Workplan implementation. Detailed descriptions of tasks and deliverables, which provide the basis for the estimated costs is provided in Section 4.

3.1 Organizational Structure

Figure 3-1 illustrates the organizational structure for implementation of this Workplan. It is built around the following key entities/positions:

- CVSC, as the lead entity, will have a key role in the ensuring the appropriate resources are available to implement the Workplan on a day-to-day basis;
- CV-SALTS Executive Committee will continue to serve as the primary venue for stakeholder input to Workplan tasks and deliverables.
- TPM will be established to support the CVSC and CV-SALTS Executive Committee with the implementation of the Workplan.
- Facilitator will be used where needed to work through policy and regulatory issues and to support Executive Committee meetings.
- TAC and Public Education and Outreach Committees (PEOC)\(^4\) will be established as standing committees to provide periodic support to the CV-SALTS Executive Committee.
- Other committees will be established where needed.

The CVSC will be responsible for securing Contractor support, where needed to implement the Workplan. Contractors may include, but are not be limited to, private consultants, public agencies, university researchers or other stakeholders. The term “Contractor” is intended to mean either a single entity or team of entities working together.

3.2 Tasks and Deliverables

Table 3-1 (Placeholder – to be developed) identifies the high-level tasks and major subtasks associated with each Workplan element. Only the task title and the associated deliverables

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\(^4\) The TAC will need to be established with new membership; the outreach committee duties could be fulfilled by the existing CV-SALTS PEOC.
are provided here. A detailed description of each task that may be used for the purpose of securing professional services to complete the task/subtasks is provided in Section 4.

3.3 Schedule (Placeholder – to be developed)

Table 3-1 (Placeholder – to be developed) provides a “complete by” date for each task and major subtask. Figure 3-1 (Placeholder – to be developed) provides a high-level schedule for each of the primary tasks/subtasks in the Workplan. The purpose of this figure is to provide a big picture view of the key tasks and the interrelated nature of certain Workplan elements, especially those which must be completed prior to implementation of other tasks.

The Workplan schedule is triggered by the Central Valley Water Board issuing an NTC to permitted dischargers. Some deliverable dates are aligned with the NTC date. For example, if something is to be submitted within 90 days after the end of the first full year of the P&O Study, the due date is 90 days after the Central Valley Water Board issues its NTC to initiate the Salt Control Program.

Figure 3-1. P&O Study Organizational Structure

3.4 Estimated Costs (Placeholder – to be developed)

Table 3-2 (Placeholder – to be developed) summarizes the estimated costs for each task and major subtask described in Section 4. These costs take into account an assumed 3 percent annual inflation rate over the anticipated 10-year P&O Study duration. The basis for the costs
of each task and major subtask is provided in Section 4. **Table 3-3** (*Placeholder – to be developed*) provides an estimate of the P&O Study cost per year.
4.0 Workplan Task Detail

4.1 Task 1 – Stakeholder Coordination

The P&O Study will be performed as a collaborative stakeholder-driven effort to develop salt management strategies to achieve salt sustainability across the Central Valley Region. The P&O Study will be implemented as a continuing activity of the existing CV-SALTS effort, which continues to include a broad coalition of representatives from agriculture, cities, industry, state and federal regulatory agencies, Environmental Justice advocates, and the general public. Given the diverse nature of this stakeholder group, the CV-SALTS stakeholder process provides the appropriate forum for the implementation of a stakeholder process to support the P&O Study.

Stakeholder participation in P&O Study activities associated with the implementation of this Workplan will occur as part of regularly scheduled CV-SALTS Executive Committee meetings. Workplan tasks are summarized below.

Task 1.1 – P&O Study Stakeholder Coordination

The P&O Study will be conducted as an open, public process through the implementation of stakeholder meetings held on a regular basis. In general, it is anticipated that these meetings will occur at least bimonthly, but the actual frequency of meetings will be planned annually through the development of an annual calendar (see Task 1.2.1). The purpose of stakeholder coordination meetings is to:

- Provide an opportunity to brief stakeholders on the overall status of the P&O Study;
- Create an environment for stakeholders to collaborate on implementation of the P&O Study Workplan and develop a long-term salt management strategy for the Central Valley Region.
- Provide a forum to present and discuss draft deliverables and findings from Workplan tasks.
- Provide a forum to develop policy recommendations to support implementation of the Workplan and provide direction to the Contractor(s).

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5 For the purposes of this Workplan, it is assumed that the P&O Study will be implemented as part of regular CV-SALTS Executive Committee meetings. This assumption does not preclude stakeholders from opting to implement the Study through a separate stakeholder process, e.g., as an independent stakeholder group or as a subset of the CV-SALTS Executive Committee.
Task 1.2 – Administration of P&O Study Stakeholder Process
The Contractor will complete the subtasks below to support stakeholder coordination activities.

Task 1.2.1 – General Administrative Support

■ Prepare and manage the P&O Study calendar. By November 1st of each year, the Contractor will propose a meeting schedule for the next calendar year, based on the Workplan schedule and input from the Executive Committee and stakeholders. Following Executive Committee review and approval, a final calendar will be established for the next calendar year. This calendar may be modified, as needed, in collaboration with stakeholders during the year.

■ Establish and maintain a stakeholder coordination contact list with the name, affiliation, address, telephone number and email of each contact.

Deliverables: Annual calendar, P&O Study stakeholder participant contact list.

Task 1.2.2 – Stakeholder Meeting Support

■ Secure a location for stakeholder coordination meetings (ideally, meetings will occur at a fixed location).

■ Prepare and send out to the P&O Study stakeholder participant list a preliminary meeting agenda at least seven business days before each stakeholder meeting. The preliminary meeting agenda will be developed collaboratively with the CVSC, Executive Committee Chairperson, the TPM, and others as needed, e.g., Central Valley Water Board staff. A final agenda with attachments will be sent out to the participant list at least two business days prior to the meeting.

■ Attend P&O Study meetings to manage meeting logistics (e.g., manage use of audio-visual equipment to facilitate the agenda, bring copies of meeting agendas/handouts, and record meeting participation).

■ Prepare draft meeting notes that summarize the highlights from each agenda item and document decisions made during the meeting. Draft meeting notes will be submitted to stakeholders for review prior to the next scheduled stakeholder meeting. Meeting notes will be revised/finalized as needed based on stakeholder comments and approved during a P&O Study meeting.

■ Post meeting information (e.g., meeting agendas, notes, and presentations) on the P&O Study website (see Task 2.1.6).

Deliverables: Preliminary and final meeting agenda, draft and final meeting notes; meeting documents posted to the P&O Study website, record of meeting participation.
Task 1.3 - Executive Committee Meeting Facilitation

Executive Committee meetings will be facilitated, either through a Contractor or by the Chairperson of the Executive Committee. The duties of the facilitator include:

- Participate in the development of the meeting agenda collaboratively with the CVSC, Executive Committee Chairperson, the TPM, and others as needed, e.g., Central Valley Water Board staff and provide a review of draft notes from the previous meeting.
- Conduct any necessary pre-meeting preparation to be familiar with the scope, content or purpose of agenda items, e.g., review findings from the technical report to facilitate meeting discussion or understand the need for specific direction/decisions associated with agenda items.
- Conduct post-meeting follow-up discussions if deemed necessary to help facilitate the overall P&O Study stakeholder process.

Deliverables: Facilitation of Executive Committee meetings; meeting agenda and notes.

Task 1.4 – Stakeholder Outreach and Coordination with Other Relevant Stakeholder Processes

Findings and recommendations from the P&O Study have the potential to impact other entities, including county, state and federal agencies, trade groups, water districts, industry, and others. Accordingly, outreach activities will be completed periodically to provide opportunities to share Study information.

1.4.1 – Outreach Planning and Materials Development

The following activities will be completed to share information (including, but not limited to, overall project status, key findings from projects, policy decisions, recommendations for regulatory changes, etc.) will be supported by the following subtasks:

- The Contractor will prepare an annual Outreach Plan early each calendar year with the first Outreach Plan to be developed at the same time as preparation of the P&O Study First Year Progress Report (see Task 2.4.1). The Plan will establish specific goals and objectives for the year, identify stakeholders to be contacted and describe outreach activities that will best support the mission and goals of the P&O Study over the next one-year period.
- Consistent with the Outreach Plan, the Contractor will prepare P&O Study outreach materials intended for dissemination to appropriate audiences (e.g., fact sheets, videos, project summaries, etc.). These materials will include information about the Study and will direct recipients to additional information and resources.

Deliverables: Annual Outreach Plan; P&O Study outreach materials (e.g., fact sheets, project summaries, recommendations) for dissemination.

1.4.2 – General Outreach Activities
The following outreach activities will be conducted as part of the P&O Study:

- A briefing on P&O Study status and key findings and recommendations to date will be provided to the Central Valley Water Board at least once each year beginning after the submittal of the Year 1 Progress Report (see Task 2.4.1). The CVSC and Executive Committee will determine: (a) who will provide the briefing, (b) nature of the materials that will need to be prepared to support the briefing; and (c) the need for Contractor assistance to prepare briefing materials.

- A briefing on P&O Study status and key findings or recommendations to date will be provided to the State Water Board on an as needed basis, using materials prepared for Central Valley Water Board briefings.

- Outreach and coordination activities will be conducted periodically to counties, sub-regional entities (e.g., GSAs), state agencies (other than the State Water Board and Central Valley Water Board) and federal agencies with water and salt management interests or responsibilities in the Central Valley Region. Outreach and coordination activities will be implemented as determined by the annual Outreach Plan prepared under Task 1.4.1.

**Deliverables:** Briefing materials

### 1.4.3 – Outreach to Salt Management Region Stakeholders

Task 4 focuses on the development of a Preferred Salt Management Alternative for each SMR established under this Workplan. The outcome is an SMR Implementation Plan that will be executed in Phase II. The Contractor will coordinate with the TPM and Executive Committee to conduct at least two workshops with local stakeholders within each SMR as follows:

- Present the top five alternatives selected for final analysis under Task 4.5; and
- Present the draft Phase II SMR Implementation Plan, including the recommended salt management alternative.

The Contractor will develop the workshop materials, coordinate with the CVSC, Executive Committee and TPM on workshop logistics (meeting date/location, notice to the area, etc.)

**Deliverables:** Presentation materials; completed workshops within each SMR.

### 4.2 Task 2 - Programmatic Activities

#### Task 2.1 – P&O Study Workplan Management

The CVSC will secure the services of a TPM to oversee the day-to-day implementation of this Workplan on behalf of the CVSC. The TPM will report to the CVSC but will work collaboratively with the CV-SALTS Executive Committee and other supporting committees. The TPM will implement the tasks below.
Task 2.1.1 – Manage Workplan Implementation
In coordination with the CVSC and the Executive Committee, the TPM will manage implementation of the Workplan through completion of the following tasks:

2.1.1.1 - Executive Committee Meetings
The TPM will attend Executive Committee meetings to report on P&O Study progress, make presentations on P&O Study projects, seek input from the Executive Committee on P&O Study deliverables and, where needed, make recommendations to facilitate implementation of the Study.

Deliverables: Participate in Executive Committee meetings.

2.1.1.2 – Annual Planning
By November 1 of each year, the TPM will prepare a P&O Study Annual Plan for the next calendar year. This Annual Plan will describe:

- Elements of the Workplan to be completed;
- Estimated expenditures planned for the upcoming year and identification of any budget concerns;
- Key milestones to be achieved, including any concerns with the overall schedule;
- Services to be procured and the approach and schedule for obtaining those services; and
- Stakeholder support needed from operating committees.

A draft Annual Plan will be submitted to the CVSC and Executive Committee for review; a final Annual Plan responsive to comments will be submitted for approval.

Deliverables: Draft and Final Annual Plan

2.1.1.3 – Manage Workplan Schedule and Budget
The TPM will manage the overall P&O Study schedule and Workplan budget to ensure that milestones and deliverables are completed as required by the overall Workplan and approved Annual Plan. As part of schedule management, the TPM will anticipate the timing of Workplan activities so that services are procured in a timely manner, especially where there are critical links in the schedule, i.e., where completion of a task is necessary to support subsequent tasks. The TPM will keep the CVSC informed of any schedule or budget concerns and provide recommendations, where needed, in order to resolve those concerns.

Deliverables: Routine report out on schedule and budget status; notification as needed of any potential concerns.
2.1.1.4 – Progress Report Preparation
The TPM will oversee the completion of the required Workplan progress reports as described in Task 2.4. The TPM will work with the CVSC, Executive Committee and Contractors, as needed to compile the necessary information and prepare the required deliverables.

Deliverables: See Task 2.4

2.1.1.5 – Stakeholder Coordination
The TPM will be responsive to stakeholders, in particular those contributing funds to the P&O Study, regarding requests for information about the status of the P&O Study as a whole, or specific projects.

Deliverables: Respond to requests for information.

2.1.1.6 - Support Workplan Adaptive Management Process
Based on knowledge gained through implementation of the Workplan and findings from P&O Study activities, it is anticipated that the Workplan may need to be revised periodically. Recommendations to revise the Workplan will be included as part of the Year 1 and Year 5 Progress Reports (see Task 2.4). In years when no Progress Report is scheduled for submittal to the Central Valley Water Board, the TPM will evaluate the Workplan (tasks, schedule/milestones and budget) and, if needed, make recommendations to the CVSC and Executive Committee for modifications to the Workplan. Where a recommended change approved by the CVSC and Executive Committee requires Central Valley Water Board approval, the CVSC will submit the recommended Workplan change(s) to the Executive Officer for approval.

This Workplan is based on a 10-year schedule. Pursuant to the Salt Control Program description in the Basin Plan, the P&O Study completion date may be extended up to five years at the discretion of the Executive Officer of the Central Valley Water Board. When appropriate, the TPM will review the overall status of completion of P&O Study milestones to evaluate whether the P&O Study will be completed within this Workplan’s 10-year schedule. Based on this evaluation, the TPM may recommend to the Executive Committee that the Workplan completion date be extended. Where needed, the TPM will work with the Executive Committee to prepare the necessary documentation to support a formal request to the Executive Officer to extend the P&O Study completion date.

Deliverables: Potential recommendations to modify the Workplan or to extend the Workplan schedule beyond 10 years (but not more than 15 years).

Task 2.1.2 – Implement P&O Study Contracted Workplan Tasks
Where Contractor support is necessary to complete a Workplan task, the TPM will work with the CVSC and Executive Committee to procure appropriate Contractor(s) with appropriate
expertise and manage the work of selected Contractors. This effort includes the following subtasks:

2.1.2.1 – Prepare Scopes of Work for Workplan Tasks
For Workplan tasks requiring Contractor support, the TPM will prepare a scope of work (including work description, task deliverables, task budget and schedule with milestones) for Executive Committee approval. As appropriate, the scope of work will be reviewed by the TAC prior to submittal to the Executive Committee for approval.

Deliverables: Draft and final scopes of work.

2.1.2.2 – Procure Contractors
The TPM will work with the CVSC to procure Contractor services to complete the Workplan task scopes of work approved for implementation under Task 2.1.2.1. It is recommended that for the implementation of tasks within each SMR to develop a Phase II Salt Management Implementation Plan (see Tasks 4.2 through Task 4.6), a single Contractor or Contractor team be procured to ensure consistency of work from start to finish.

If the procurement process for the task requires use of a Selection Committee, the TPM will (a) work with the Executive Committee to establish an ad hoc Selection Committee for the procurement; and (b) manage the work of the Selection Committee to select a Contractor. Recommendations from the Selection Committee will be subject to CVSC and Executive Committee approval. Once a Contractor is formally selected for any project, the TPM will support the CVSC’s process to establish a contract with the Contractor and initiate execution of the project.

Deliverables: Selected Contractor(s) for implementation of Workplan tasks.

2.1.2.3 - Manage Contractors
The TPM will manage the work of all Contractors procured under Task 2.1.2.2. Management activities include the following activities:

■ Periodic check-ins with Contractors to discuss project progress including status of project deliverables and adherence to the project schedule and budget.
■ Manage timely reviews of Contractor deliverables by the TAC (where needed), Executive Committee and stakeholders.

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Discussion of procurement procedures has not been included in this Workplan. It is assumed that the CVSC as the lead entity will implement its procurement procedures during implementation of the Workplan. It is also assumed that any contracts to complete Workplan task will be established between the CVSC and the Contractor; the TPM does not issue the contract.
Verify the completeness of Contractor deliverables, including verifying that comments on draft deliverables have been adequately addressed.

Ensure project deliverables, including the supporting data files and shapefiles, are obtained and properly stored in the P&O Study data repository (see Task 2.1.5).

Facilitate interaction with the Executive Committee to ensure project findings and recommendations are properly evaluated and discussed.

The TPM will be responsible for notifying the CVSC regarding any concerns about Contractor performance or potential deviations from the project scope of work (deliverables, schedule or budget). Any such communications will include recommendations to resolve the concerns.

**Deliverables:** Contractor check-ins, TAC, and Executive review of project deliverables, receipt of final project deliverables

**Task 2.1.3 – Coordinate with Technical Advisory Committee**

The TPM will implement the following activities:

- Work with the Executive Committee to ensure that a TAC is established with volunteers with sufficient availability throughout the duration of the P&O Study.
- Obtain TAC review of the draft Annual Plan (see Task 2.1.1.2).
- Obtain TAC review of draft scopes of work prior to implementing the procurement process for a task.
- Coordinate with the TAC on a regular basis to keep them informed of the timing and need for review of task deliverables.
- Facilitate the review process of Contractor deliverables, including obtaining TAC comments on the deliverable and coordinating any needed teleconferences or face-to-face meetings with Contractors to provide a forum for direct discussion of the deliverables.

**Deliverables:** TAC review of the Annual Plan and project deliverables

**Task 2.1.4 – Coordinate with Other P&O Study Committees**

Throughout the course of the P&O Study, the Executive Committee may establish special committees to facilitate specific Workplan tasks. As directed, the TPM will work with these committees to support implementation of the Workplan.

**Deliverables:** As requested support to P&O Study Committees

**Task 2.1.5 – Manage Data and Information**

The TPM will work with the CVSC and Executive Committee to implement the following activities to manage data and information developed by the P&O Study:
Establish an appropriate repository for data and information, including, but not limited to, task reports and technical memoranda, data files, geographic information systems (GIS) shapefiles, committee meeting agendas, notes and presentations, and key documents identified through literature reviews or that provide key support to P&O Study recommendations (this includes any documents that may need to be part of an administrative record for future Basin Plan amendments). The data and information repository developed for the P&O Study should be structured in a manner that facilitates data sharing between the P&O Study and the CV-SALTS Surveillance and Monitoring Program (SAMP).

Ensure that required Contractor deliverables and other P&O Study documents are stored in the data repository.

Develop data management policies and procedures for access to data and information retained in the data repository.

Manage requests from stakeholders for access to deliverables per approved policies and procedures.

Deliverables: P&O Study Data Repository; data management policies and procedures; facilitate data and information sharing per approved data management policies and procedures.

Task 2.1.6– Disseminate Findings and Provide Outreach Support

The TPM will support the CVSC and Executive Committee with efforts to disseminate findings from P&O Study tasks. Support may include:

- Assisting with the implementation of the annual Outreach Plan (see Task 1.4.1).
- Making presentations to agencies, organizations, and at water conferences and symposia as approved by the Executive Committee.
- Assisting with the development of a sitemap for a P&O Study webpage; once a webpage is established, the TPM will work collaboratively with the Contractor providing administrative support to the P&O Study (see Task 1.2.2) to post P&O Study materials to the webpage.

Deliverables: Outreach presentations, P&O Study sitemap, P&O Study material posted to webpage.

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7 It is assumed that the CVSC, as the lead entity, will establish a website for the P&O Study using existing web resources established for CV-SALTS.
Task 2.2 – Funding Plan
This Workplan includes development of two types of funding plans: (a) a funding plan for Phase I of the Salt Control Program and thus the tasks included in this Workplan; and (b) a long-term funding plan for Phases II and III of the Salt Control Program.

Task 2.2.1 – Phase I Funding Plan
Funding for Phase I of the Salt Control Program, i.e., the P&O Study, will be established, at least in part, through financial support provided by the permitted dischargers that elect the Alternative Salinity Permitting Approach as their compliance pathway during Phase I. The amount of funding provided by permitted dischargers will vary by permit type, including communities (e.g., POTWs and MS4s), irrigated agriculture, dairies, food processors, oil & gas, wineries, and others). The CVSC has determined the required level of funding to be provided by each permit type. The collection of these fees, which will provide general funds for implementation of the P&O Study, will be managed by the CVSC. Additional sources of funding from other entities using water or other resources from the Central Valley Region will be sought during Workplan implementation to augment or offset this base funding source including state and federal funding sources. Under this Workplan, the CVSC, or its designee, will prepare a Phase I Funding Plan through completion of the subtasks below.

Task 2.2.1.1 – Prepare Draft Phase I Funding Plan
Within six months of initiation of this Workplan, a draft Phase I Funding Plan will be submitted to the Executive Committee for review and comment. The draft Phase I Funding Plan will include the following elements:

- Description of the fee structure applicable to permitted dischargers (and other Phase I contributors, if any) participating in the P&O Study. This description will document the fees to be paid by permit type and the basis for the distribution of fees among permit types.

- The process that the CVSC will implement to collect fees from permitted dischargers (and other Phase I contributors if participating in the Study), including the procedures to document to the Central Valley Water Board that permittees, who have opted to participate in the P&O Study, are in compliance with the fee requirement.

- The procedures that the CVSC will implement if a permitted discharger has not paid or is late in payment of required fees.

- Identification of potential sources of other funds (e.g., State, federal, external water users) to augment or offset the collection of fees from permitted dischargers. For each source identified, the Funding Plan will include a process and schedule for seeking the potential funds during the Phase I P&O Study.

- Procedures to revise the Phase I Funding Plan, if deemed necessary during the P&O Study.
Procedures to provide information to support the preparation of P&O Study progress reports (see Task 2.4).

Task 2.2.1.2 – Prepare Final Phase I Funding Plan
No later than one year after the Central Valley Water Board issues its NTC with the Salt Control Program, a final Phase I Funding Plan will be submitted to the Executive Officer of the Central Valley Water Board. This final Plan will be developed based on comments received on the draft Phase I Funding Plan.

Deliverables (Tasks 2.2.1.1 and 2.2.1.2): Draft and Final Phase I Funding Plans

Task 2.2.2 – Long-term Funding Plan
The Salt Control Program requires development of a Long-term Funding Plan to fund implementation of Phases II and III of the Program. These phases focus on the design and implementation of large-scale salinity management projects intended to bring SMRs into salt sustainability over a long-term period. The following tasks will be implemented during the P&O Study to develop the Long-term Funding Plan.

Task 2.2.2.1 – Identify and Secure Sources of Long-term Funding
The Contractor will work collaboratively with the CVSC to identify and secure long-term funding source commitments for Phases II and III. This effort will include the following activities:

- Identify existing sources of funding for water and salt management infrastructure projects and, if directed, initiate actions to seek available funds, e.g., preparation of grant proposals and low-cost loan applications.
- Support efforts to seek new sources of funding through legislative action at the state or federal level. This effort will include developing legislative proposals and assisting with efforts to obtain legislative support.

Deliverables: Identification of existing sources of funds; prepare legislative proposals.

Task 2.2.2.2 – Coordinate Development of Long-term Funding and Governance Plans
The long-term funding and governance plans to facilitate implementation of Phases II and III of the Salt Control Program need to be aligned. For example, within the Governance Plan the roles and responsibilities for the management of program funds will need to be addressed. Under this task, the Contractor(s) for the development of these long-term plans will work collaboratively to ensure the respective long-term plans are appropriately aligned.

Deliverables: Collaboration between development of Long-term Funding and Governance Plans.
Task 2.2.2.3 - Prepare Draft Long-term Funding Plan

No later than 18 months before the anticipated end of Phase I, the Contractor will develop a draft Long-term Funding Plan for Phases II and III. This draft Plan will include:

- Financial strategy that provides an overall summary of how Phases II and III will be funded.

- Financial goals for Phases II and III by documenting anticipated planning, capital, and O&M costs for each phase (as known at the time that this Plan is being developed). Based on these projections, develop fund acquisition targets. These may be developed temporally, e.g., for each year or at five-year intervals, and/or spatially, e.g., by SMR.

- Financial approach for funding long-term salt management projects by identifying sources of funds to target (e.g., local/state/federal funds, grants and low-interest loans, bond programs). For each targeted funding source, the following information will be provided, as applicable to the type of funding: funding source, who may apply for the funding, timing of funding availability, how the funds may be applied for, the criteria for evaluating funding applications, in-kind funding match requirements, and any actions that may be needed to retain the funding source as an option in the future, e.g., supporting efforts to reauthorize a sunsetting grant program.

- New anticipated sources of funding that may become available in the near future (e.g., prior to initiation of Phases II and III and how they may be used to support these later phases. For each potential new source, develop a strategy to facilitate establishment of the funding source. Where applicable, include information similar to above (see previous bullet).

- Procedures to implement the Long-term Funding Plan, including, but not necessarily limited to: Roles and responsibilities for implementation, accountability procedures, including periodic program audits, and reporting requirements to document implementation of the Long-term Funding Plan (Note: This subtask will be coordinated as needed with the development of Task 2.3.2 - Long-term Governance Plan).

- Procedures for the equitable use of general funds secured for Phases II and III that are not designated for a specific salt management project. The Contractor will develop procedures that include (a) criteria to apply for funds; (b) criteria to evaluate proposals received requesting use of funds to support projects in Phases II and III; and (c) minimum requirements for in-kind contributions.

- Schedule with milestones for implementation of the Long-term Funding Plan.

- Adaptive management process to keep the financial approach current, e.g., to take advantage of any new funding opportunities not previously considered in the development of the Plan or to address changing Phase II or III financial goals.
Task 2.2.2.4 – Prepare Final Long-term Funding Plan

No later than 12 months before the anticipated end of Phase I, the Contractor will submit a final Long-term Funding Plan for Phases II and III. This final Plan will be developed based on comments received on the draft Long-term Funding Plan.

Deliverables (Tasks 2.2.2.3 and 2.2.2.4): Draft and final Long-term Funding Plans; optional deliverable – secured funding source(s) prior to implementation of Phase II.

Task 2.3 – Governance Plan

The purpose of this task is to develop two types of governance plans: (a) governance plan to support Phase I implementation; and (b) Long-term Governance Plan to facilitate implementation of Phases II and III of the Salt Control Program.

Task 2.3.1 – Phase I Governance Plan Development

The Basin Plan amendment identified the CVSC as the lead entity at the inception of the P&O Study. The CVSC collaborates with the Central Valley Water Board and State Water Board through implementation of State Water Board Resolution No. 2009-0085, which authorized the Executive Director to Sign a Memorandum of Agreement (MOA) between the State Water Board, Central Valley Water Board, and the CVSC. The continued implementation of this MOA facilitates initiation of the P&O Study. The Phase I Governance Plan will be developed through the subtasks below.

Task 2.3.1.1 – Prepare Draft Phase I Governance Plan

Within six months of initiation of this Workplan, a draft Phase I Governance Plan will be submitted to the CVSC and Executive Committee for review and comment. The Contractor will work with the CVSC to prepare a draft Phase I Governance Plan that includes the following elements:

- Identifies the governing authority for Phase I:
  - If the CVSC continues in the lead role, the Contractor will assist the CVSC with any necessary updates to the existing MOA to ensure that the MOA fully supports implementation of all elements of the Workplan by the CVSC.
  - If the Phase I Governance Plan proposes to transfer the governing authority from the CVSC to another entity, the Contractor will assist with the preparation of appropriate documentation to facilitate the change, including a new MOA with the appropriate regulatory agencies, as needed. A schedule and process for transferring responsibility from the CVSC to the new entity will be included in the Phase I Governance Plan.

- Describes the governance structure of the lead entity for implementation of the P&O Study, including as needed: (a) organizational and reporting structure; (b) roles and responsibilities of key bodies within the organization, e.g., committees, or key positions; (c) communication procedures; (d) decision-making/voting procedures; and (e) dispute resolution procedures.
Documents the administrative procedures to support implementation of the Workplan, including at a minimum, procedures to:

- Coordinate with the Executive Committee to facilitate stakeholder participation and Workplan task execution (see Task 1).
- Secure any necessary Contractor or staff resources to support Workplan implementation (e.g., administrative support, facilitation, or TPM).
- Develop, approve and manage the annual P&O Study budget.
- Coordinate with the Central Valley Water Board and State Water Board.
- Support outreach efforts determined appropriate under Task 1.4.
- Support preparation of P&O Study progress reports (see Task 2.4)

Provides procedures to revise the Phase I Governance Plan, if deemed necessary during the P&O Study.

Task 2.3.1.2 – Prepare Final Phase I Governance Plan

No later than one year after the Central Valley Water Board issues its NTC with the Salt Control Program, a final Phase I Governance Plan will be submitted to the Executive Officer of the Central Valley Water Board. This final Plan will be developed based on comments received on the draft Phase I Governance Plan.

Deliverables: Draft and Final Phase I Governance Plans

Task 2.3.2 – Long-term Governance Plan Development

The Salt Control Program requires the development of a Long-term Governance Plan for implementation under Phases II and III to support development and implementation of salt management projects that require participation among multiple entities. The following tasks will be implemented to develop this Plan:

Task 2.3.2.1 – Select Long-term Governance Structure

The Contractor will develop recommendations for a governance structure (e.g., public/private partnerships, joint ventures, joint powers authority, etc.) to support implementation of Phases II and III of the Salt Control Program. To develop the recommendations, the Contractor will consider: (a) the types of salt management projects likely to be included in the portfolios of projects to be developed in SMRs in Phases II and III; and (b) the public and private entities expected to participate in these projects. Based on the evaluation of relevant factors, the Contractor will prepare for consideration by the CVSC and Executive Committee a draft memorandum that provides a recommended governance structure and, if appropriate, potential alternatives. Based on comments on the draft memorandum, the Contractor will prepare a final memorandum that documents the selection of a governance structure for development in subsequent tasks.
Deliverables: Draft and final memoranda recommending the type of governance structure for Phases II and III.

Task 2.3.2.2 – Coordinate with Long-term Funding Plan Development
The Contractor will coordinate efforts to develop a Long-term Governance Plan with the development of the Long-term Funding Plan under Task 2.2.2.

Task 2.3.2.3 – Prepare Draft Long-term Governance Plan
No later than 18 months before the anticipated end of Phase I, the Contractor will develop a draft Long-term Governance Plan for Phases II and III. This draft Plan will include:

- Overall governance strategy for Phases II and III, including (a) history and basis for the selection of the governance structure and governing body (outcome of Task 2.3.2.1); and (b) purpose and objectives of the governing body to be established for Phases II and III.
- Description of governing body structure and procedures, including, but not limited to: (a) authority to accomplish the stated purpose and objectives; (b) composition of the governing body and associated roles and responsibilities; and (c) operational procedures (e.g., terms of appointment, decision-making/voting, meeting schedule, committees, reporting)
- Governing body organizational and reporting structure with anticipated staff identified
- Expected annual resource needs, including annual funding to carry out the duties of the governing body.
- Procedures and schedule for establishment of the governance structure for Phase II, including legal requirements for establishing the governing body.
- Procedures to develop and implement Phase II and III projects.

Task 2.3.2.4 – Prepare Final Long-term Governance Plan
No later than 12 months before the anticipated end of Phase I, the Contractor will submit a final Long-term Governance Plan for Phases II and III. This Final Plan will be developed based on comments received on the draft Long-term Governance Plan.

Deliverables (2.3.2.3 and 2.3.2.4): Draft and final Long-term Governance Plans

Task 2.4 – Reporting
The Salt Control Program requires a report on the status of Workplan implementation by end of Years 1, 5 and 10 after initiation of the Program. In addition, the Workplan requires submittal of an Interim Report at the end of Year 5 and a Final Report at the end of Year 10. To increase efficiency, the status reports required at the end of Year 5 and Year 10 will be incorporated into the Year 5 Interim Report and Year 10 Final Report, respectively. The following subtasks describe the work to be completed for each Report.
**Task 2.4.1 - Year 1 Progress Report**

A P&O Study Year 1 Progress Report will be submitted to the Central Valley Water Board within 90 days after the end of the first full year of implementation of the P&O Study Workplan. The Year 1 Progress Report will include the following information about the Study:

- Summary of key findings on completed Workplan tasks.
- Progress made and findings to date on incomplete but active project tasks.
- Workplan tasks planned for initiation prior to the Year 5 Interim & Progress Report.
- Recommendations for modification of any Workplan tasks or schedule based on outcome of the first year of implementation. These recommendations (if any) will be submitted as a revised Workplan that is attached to the Progress Report (any recommended changes to the Workplan require Executive Officer approval).
- Summary of stakeholder participation during the reporting periods, including documentation of P&O meetings held (agendas, meeting notes, list of attendees).
- Budget summary that identifies available funds to continue Workplan implementation, anticipated funding through Year 5 of the Study, and a summary of expenditures during the reporting period.

A draft Year 1 Progress Report will be submitted to the CVSC and Executive Committee for review and comment within 30 days after the end of the reporting period. A final Year 1 Progress Report will be prepared that is responsive to the comments on the draft report. The CVSC will submit the final Year 1 Progress Report to the Executive Officer of the Central Valley Water Board. Recommendations for modifications to the Workplan may be implemented only if approved by the Executive Officer.

**Deliverables:** Draft and final Year 1 Progress Reports.

**Task 2.4.2 - Year 5 Interim & Progress Report**

A Year 5 Interim & Progress Report will be submitted to the Central Valley Water Board within 180 days after the end of Year 5 of the P&O Study (as defined by the date of the NTC with the Salt Control Program). The Year 5 Interim & Progress Report will address the following topics:

- **Overview of P&O Study Progress:**
  - Summary of key findings on completed Workplan tasks.
  - Recommendations for modification of any Workplan tasks or schedule based on outcome of the first five years of implementation. These recommendations (if any) will be submitted as a revised Workplan that is attached to the Progress Report (any recommended changes to the Workplan require Executive Officer approval).
- Summary of stakeholder participation, including documentation of P&O meetings held (agendas, meeting notes, list of attendees).

- Budget summary that identifies available funds to continue Workplan implementation, anticipated funding through Year10 of the Study, and a summary of expenditures to date.

**Non-Physical Project Status**

- Provide a summary of findings from completed non-physical projects. The final reports from these projects will be appended to the Report.

- Provide a status report on each active non-physical project, including a summary of findings to date, remaining work to be completed and a schedule for completion.

- Summarize Workplan projects still to be implemented and identify any anticipated changes to the scope, schedule or budget for these projects and the basis for these changes.

- Identify any new non-physical projects planned for implementation under the P&O Study that will be added to the existing Workplan. New projects may be identified based on the findings from other P&O Study Workplan activities. For any new projects, the Report should include a description of the anticipated scope of work, cost, and schedule for implementation.

**Salt Management Strategy Alternatives Development**

- Identify the SMRs created under Task 4.1.1

- Identify proposed designated Salt Management Areas (SMA) and the next steps required to formally establish these locations as designated salt management and disposal sites.

- For each SMR describe the proposed alternatives to achieve long-term salt sustainability. For each alternative, provide (a) an overview of how and over what time frame the alternative is expected to achieve salt sustainability; (b) the proposed non-physical and/or physical projects included in the alternative; and (c) the anticipated salt load reductions expected from each element of the alternative. Any reports that support descriptions of alternatives will be appended to the Report.

- Summarize the next steps to be implemented under the Workplan to select a preferred Salt Management Alternative for implementation in Phase II.

A draft Year 5 Interim & Progress Report will be submitted to the CVSC and Executive Committee for review and comment within 30 days after the end of the reporting period. A final report will be prepared that is responsive to the comments on the draft report. The CVSC will submit the final Year 5 Interim & Progress Report to the Executive Officer of the Central Valley Water Board. Recommendations for modifications to the Workplan may be implemented only if approved by the Executive Officer.
Deliverables: Draft and final Year 5 Interim & Progress Report.

Task 2.4.3 - Year 10 Final Report
A P&O Study Year 10 Final Report\(^8\) will be submitted to the Central Valley Water Board within 180 days after the end of Year 10 of the P&O Study (as defined by the date of the NTC with the Salt Control Program). The Year 10 Final Report will address the following topics:

- P&O Study activities since Year 5 Interim & Progress Report
  - Summary of key findings on Workplan tasks completed since the Year 5 Report.
  - Summary of stakeholder participation, including documentation of P&O meetings held (agendas, meeting notes, list of attendees).
  - Budget summary that compiles and analyzes expenditures.

- Non-Physical Project Status
  - Provide a summary of findings from completed non-physical projects. The final reports from these projects will be appended to the Year 10 Final Report.
  - Provide a status report on any active non-physical projects that will continue during Phase II of the Salt Control Program, including a summary of findings to date, remaining work to be completed and a schedule for completion.
  - Identify any new non-physical projects planned for implementation under Phase II of the Salt Control Program. New projects may be identified based on the findings from other P&O Study Workplan activities. For any new projects, the Year 10 Final Report will include a description of the anticipated scope of work, cost, and schedule for implementation.

- Salt Management Strategy Alternatives for each SMR
  - Summarize the Preferred Salt Management Alternative for each SMR (append completed strategies to the report), including the physical projects to be implemented and the schedule for implementation under Phases II and III. For each physical project provide the conceptual design and assessment of environmental permitting requirements for implementation.
  - Summarize the next steps to be implemented in each SMR after initiation of Phase II of the Salt Control Program.

\(^8\) This Workplan assumes a 10-year schedule. At the discretion of the Central Valley Water Board’s Executive Officer, the completion date and interim milestones for the P&O Study may be modified or extended. If necessary, a request for an extension would be made under Task 2.1.1.6. If an extension is approved, the Workplan would be modified as needed, including reporting requirements.
A draft Year 10 Final Report will be submitted to the CVSC and Executive Committee for review and comment within 30 days after the end of the reporting period. A final Year 10 Final Report will be prepared that is responsive to the comments on the draft report. The CVSC will submit the final Year 10 Final Report to the Executive Officer of the Central Valley Water Board. Recommendations for modifications to the Workplan may be implemented only if approved by the Executive Officer.

Deliverables: Draft and final Year 10 Report.

**Task 2.5 – Basin Plan Amendment Recommendations**

The Salt Control Program states that upon completion of Phase I, and prior to initiation of Phase II, the Central Valley Water Board will re-evaluate the Conservative and Alternative Salinity Permitting Approaches applicable under Phase I of the Salt Control Program. This evaluation will consider findings from the P&O Study as well as results from surveillance and monitoring programs, proposals for use of other permitting options or approaches, and progress made towards meeting the overarching goals of the Salt Control Program. The purpose of this task is to support development of recommendations for amendments to the Basin Plans to facilitate Phase II of the Salt Control Program. This Workplan task will be completed primarily through Executive Committee meetings conducted as part of the P&O Study stakeholder process. Contractor support will be obtained, if needed.

**Task 2.5.1 – Recommendations to Amend the Basin Plans**

When appropriate, but no later than within two years of the anticipated end of Phase I, the Executive Committee will initiate discussions through the P&O Study stakeholder process to develop recommendations based on the findings of the P&O Study to date for modifications to the Basin Plans to facilitate Phase II. Based on these discussions and Central Valley Water Board concurrence, a final list of recommendations will be prepared.

Deliverable: Recommended modifications to the Basin Plans to support Phase II of the Salt Control Program.

**Task 2.5.2 – Draft Proposed Basin Plan Amendment Language**

The Executive Committee will draft proposed Basin Plan amendment language for consideration by the Central Valley Water Board. The Executive Committee stakeholder process will be used to review, comment and finalize proposed Basin Plan amendment language.

Deliverable: Final proposed Basin Plan amendment language, as required.

**Task 2.5.3 – Support Basin Plan Amendment Adoption Process**

The Executive Committee will support the Central Valley Water Board during the Basin Plan amendment adoption process.

Deliverable: As requested support to the Central Valley Water Board.
4.3 Task 3 – Non-Physical Projects

Task 3 is comprised of projects and activities that range from the evaluation of existing requirements to manage salt to the development of tools or completion of studies that support the development of preferred salt management alternative for the SMRs. The schedule for the implementation of these projects is aligned with the need for the information to support Task 4 activities. For example, development of appropriate targets to protect the AGR beneficial use will facilitate the establishment of salt management targets for each SMR. This information will be needed as part of the evaluation to determine the salt sustainability gap that currently exists within the defined SMRs. This Workplan includes those non-physical projects that have been identified at the outset as being necessary to implement the overall Workplan. Through Executive Committee discussions and findings from Workplan deliverables, additional non-physical projects may be identified. Scopes of work will be developed on an as needed basis.

Task 3.1 – Regulatory & Policy-related Projects

The Workplan includes several tasks to develop regulatory or policy-related information to support preparation of a Preferred Salt Management Alternative for each SMR:

- Establishment of Appropriate Numeric Salt Management Targets:
- Assessment of Central Valley Region Water and Salt Management Requirements and Responsibilities;
- Evaluation of Management Zone Approach to Manage Salt; and
- Policy Discussions to Support Development of Preferred Salt Management Alternatives for SMRs.

The following subtasks provide the Workplan approach to address each of the above regulatory/policy-related projects.

Task 3.1.1 – Establishment of Appropriate Numeric Salt Management Targets

As part of the P&O study, the Contractor will develop numeric targets to protect the agricultural supply (AGR) beneficial use in surface waters and groundwaters of the Central Valley Region. In performing this task, the Contractor will work with agricultural and other local stakeholders in different areas of the region to address the balance between setting AGR targets that protect salt sensitive crops and setting targets that compromise the ability to obtain agricultural water supplies and/or comply with limitations on the discharge of agricultural return flows. The Contractor will also work with agricultural and other stakeholders to establish numeric AGR targets that can be applied during extended dry periods when special salt management and irrigation practices are needed to maintain agricultural irrigation water supplies. A factor to be considered in this effort is the evolving nature of crop sensitivity to salts given the ongoing research and development in this area within the agricultural community.
CV-SALTS has developed a fundamental approach to the development of AGR numeric targets in surface waters that is documented in CV-SALTS (2014b, 2014c). This methodology was used in the development of water quality objectives for electrical conductivity (EC) in the Lower San Joaquin River which were adopted in a Basin Plan amendment approved by the Central Valley Water Board on June 9, 2017 (Resolution R5-2017-0062), The State Water Board and USEPA approved the amendment on January 9, 2018 (Resolution No. 2018-0002) and December 17, 2018, respectively.

The approved approach started with the development of baseline information regarding (a) existing cropping patterns in the study area and (b) agricultural water supply information. That information was used to identify important salt sensitive crops and to assign numeric salinity targets to those water bodies used as irrigation supply to those crops. The salinity targets were developed with available modeling tools that took into account the crop, cropping pattern, root-zone hydrology (i.e. balance among rainfall, irrigation, crop consumptive use, and leaching fraction), and salinity of irrigation supply, and which produced soil salinity and crop yield impact outputs. That information was combined with irrigator stakeholder input to select AGR numeric targets, which were then adopted as water quality objectives through a process which considered existing and projected future salinity conditions in the Lower San Joaquin River using modeling tools and historical water quality information.

Under the P&O Study, the Contractor will use the above-described methods in several selected study areas that are chosen, with input from CV-SALTS Executive Committee and stakeholders, to provide a proof of concept (archetype) and representative information that will be used in a process to establish AGR target values for surface waters and groundwater in the Central Valley Region. Using the information from the archetype studies, the Contractor will develop and apply a process/method for determining AGR target values for normal and drought/extended dry period conditions for the Central Valley Region to protect salt sensitive crops. At the option of the Executive Committee, the Contractor may be asked to provide services to support adoption of either narrative or numeric water quality objectives to protect AGR beneficial uses in specific areas through a Basin Plan amendment. To accomplish these outcomes, the Contractor will perform the following tasks:

Task 3.1.1.1 – Identify Archetype Study Areas
Identify candidate archetype study areas in coordination with the CV-SALTS Executive Committee and stakeholders using best available information on existing agricultural land use (cropping patterns) in the Central Valley Region. Recommended archetype study areas will be presented to the Executive Committed and stakeholders for approval before initiating subsequent tasks.

Deliverable: Draft and final technical memoranda identifying proposed candidate archetype study areas.
Task 3.1.1.2 – Identify Salt Sensitive Crops in Selected Study Areas
Using best available cropping information, rank crop acreage and determine common salt sensitive crops in selected study areas. The Contractor will work with agricultural stakeholders to identify the best available information regarding sensitivity of common crops to salts, with attention to innovations in the development of crops with an increased ability to tolerate salinity.

Task 3.1.1.3 – Identify Irrigation Supply Sources
Identify irrigation supply sources (surface waters and groundwater) to common salt sensitive crops grown within the study areas determined in Task 3.1.1.2. The Contractor will characterize and, to the extent possible, quantify salinity of agricultural supply waters, during normal and dry years.

Task 3.1.1.4 – Determine Relationship Between Salinity and Crop Yields.
The Contractor will use best available modeling tools to determine relationships between irrigation supply salinity and crop yields for the salt sensitive crops identified in Task 3.1.1.2.

Task 3.1.1.5 – Evaluate Salt Management Scenarios
Using the existing baseline water quality information for waters used as agricultural supply in the archetype study areas developed in Task 3.1.1.3, the Contractor will identify and implement best available modeling tools to evaluate the effectiveness of management scenarios in improving water quality. The Contractor will coordinate with stakeholders to determine a wide range of management scenarios that could be employed to impact the existing water quality baseline and use the selected modeling tools to identify a range of attainable future water quality conditions.

Task 3.1.1.6 – Develop Range of Potential Target EC Values
In coordination with local irrigators, using information from Tasks 3.1.1.2, 3.1.1.3 and 3.1.1.4, the Contractor will develop a range of potential target EC values for (a) normal water years; and (b) drought/extended dry period conditions. This step will include consideration of the existing quality of supply waters (from Task 3.1.1.3). Informed by the range of attainable water quality conditions developed in Task 3.1.1.5, the Contractor will work with stakeholders to select different target salinity values for (a) normal and (b) drought/extended dry years for the study areas. Note that selected target values for drought/extended dry periods will be higher than the values determined for normal conditions to allow greater flexibility for water and salinity management.

Deliverables (Tasks 3.1.1.2 through 3.1.1.6): Draft and final technical memoranda for each archetype study area describing the methods, results and conclusions of the analysis performed to determine target salinity values.
Task 3.1.1.7 – Develop Process to Establish Target Salinity Values

In coordination with CV-SALTS Executive Committee and stakeholders, develop a process using available cropping and water quality information and information and methodologies derived in the archetype studies to establish target salinity values for appropriate regional areas within the remainder of the Central Valley Region to protect the AGR beneficial use of water. This process will use available information to address region-specific issues such as common crop identification, existing water quality, irrigation practices, water management practices, and projections for future water quality improvements. The Contractor will use the resulting process to establish regional salinity targets throughout the Central Valley Region for normal and drought/extended dry period conditions.

Deliverable: Draft and final technical memoranda describing process, results and conclusions of analysis to set regional salinity targets protective of AGR use in the remainder of the Central Valley Region.

Task 3.1.1.8 – Develop Process to Refine Salinity Targets

The Contractor will develop and document a process which allows for site-specific refinement of regional salinity targets developed in Task 3.1.1.7, based on consideration of more refined regional data analysis, region-specific modeling outputs and enhanced stakeholder engagement.

Deliverable: Draft and final technical memoranda describing process for site-specific refinement of regional salinity targets.

Task 3.1.1.9 - Support Adoption of AGR Targets in Basin Plans (optional)

The Contractor will provide services to support adoption of the AGR targets into the Central Valley Region Basin Plans by the Central Valley Water Board through a Basin Plan amendment, either as a means of implementing narrative water quality objectives or as numeric water quality objectives to protect AGR uses. Support will include development of technical information for the staff report prepared by Central Valley Water Board staff, including preparation of California Environmental Quality Act (CEQA), economic and antidegradation analyses.

Deliverables – Draft and final technical memoranda providing technical information to support the staff report for a Basin Plan amendment, including CEQA, economic and antidegradation analyses associated with adoption of water quality objectives for AGR uses.

Task 3.1.2 – Assessment of Central Valley Region Water and Salt Management Requirements and Responsibilities

The number of local, state and federal statutes, regulations, ordinances, policies, guidance and procedures in place that effect the management of water and salt in the Central Valley Region is significant. While individually these elements may have a particular purpose or address a particular concern, collectively various elements may conflict with one another. For
example, while measures to increase water conservation may be beneficial for ensuring a reliable water supply, conservation activities can increase the concentration of salt in surface waters and groundwaters. Similar to the broad array of water and salt management requirements is the significant number of entities that have some oversight role in the management of these requirements. The purpose of this task is to conduct a comprehensive review of existing water and salt management requirements in the Region to identify significant existing or potential conflicts that may impact implementation of the Salt Control Program in Phases II and III. Where such significant conflicts are identified, recommendations will be developed to resolve or otherwise address the conflict.

3.1.2.1 – Develop Regulatory Review Plan to Assess Water and Salt Requirements and Responsibilities

In collaboration with stakeholders, the Contractor will develop a list of existing local, state and federal statutes, regulations and ordinances; policies; guidance and procedures that have the potential to have a significant effect on the management of water and salt in the Central Valley Region. Areas to be evaluated include requirements related to, but not limited to: water quality and beneficial use protection (including aquatic life uses), including potential impacts to the Bay Delta; water rights/water transfers, groundwater sustainability, land use zoning/planning, minimum instream flow protections, recycled water use, stormwater recharge, water conservation, and waste disposal. Along with the list of requirements to be assessed, the Contractor will also develop a list of entities that have responsibility for implementation of the requirements. The Contractor will submit the Regulatory Review Plan to the Executive Committee for review. A final plan will be developed based on Executive Committee comments.

Deliverable: Draft and final Regulatory Review Plan.

3.1.2.2 – Implement Regulatory Review Plan

The Contractor will implement the Regulatory Review Plan and complete the following for each document included in the Review Plan:

- Develop an annotated summary of the purpose and requirements as related to the management of water and salt associated with each document included for review.
- Identify the entity(ies) responsible for the implementation of the requirements established by the document.
- Identify existing and potential significant conflicts with emphasis on challenges to the management of water and salt in the future to achieve sustainability in the Central Valley Region. Where existing or potential conflicts are identified, the Contractor will provide examples for illustration.
- Develop recommendations in the following areas to facilitate efforts to achieve salt sustainability:
− Potential modifications to existing water or salt management requirements that could facilitate efforts to achieve salt sustainability;
− Potential modifications to existing roles and responsibilities for water or salt management that could facilitate efforts to achieve salt sustainability; and
− Development of new requirements, where feasible.

The Contractor will prepare a draft Regulatory Review Report for Executive Committee review that provides the findings from the above review process. Based on comments received from the Executive Committee, the Contractor will prepare a final Regulatory Review Report.

**Deliverable:** Draft and final Regulatory Review Reports; electronic copies of all documents reviewed.

**Task 3.1.3 – Evaluation of Management Zone Approach to Manage Salt**

The Nitrate Control Program adopted into the Central Valley Basin Plans includes the use of Management Zones to facilitate the collective management of nitrate by stakeholders within discrete areas (approved by the Central Valley Board May 31, 2018 and State Water Board __________, 2019, Resolutions R5-2018-0034 and 2019-__________, respectively). The Basin Plans define a Management Zone as follows, “A discrete and generally hydrologically contiguous area for which permitted discharger(s) participating in the management zone collectively work to meet the goals of the SNMP and for which regulatory compliance is evaluated based on the permittees collective impact, including any alternative compliance programs, on a defined portion of the aquifer. Where Management Zones cross groundwater basin or sub-basin boundaries, regulatory compliance is assessed separately for each basin or sub-basin. Management Zones must be approved by the Central Valley Water Board.”

One of the key benefits of a Management Zone approach to manage a pollutant is that it provides the opportunity for dischargers to pool resources to solve problems. Also, because a Management Zone is defined as a hydrologically contiguous area, the opportunity to consider innovative approaches to salt management that consider pollutant management in parallel with water management strategies exists.

Task 4 of this Workplan leads to the identification of a Preferred Salt Management Alternative for each SMR. This alternative will include a combination of existing and planned projects, non-physical projects and physical projects. These projects may be implemented within the SMR or jointly with other SMRs. Near the completion of the development of a preferred alternative for each SMR, the Contractor will evaluate the various plans in development for each SMR to evaluate the potential use of a Management Zone implementation approach, similar to the program being implemented through the Central Valley Nitrate Control Program. The findings from this evaluation may be used to support development of the permitting approach for salt in Phase II of the Salt Control Program.
Task 3.1.3.1 – Evaluate Nitrate Control Program’s Management Zone Permitting Approach

The Contractor will conduct an evaluation of existing Management Zones established to support implementation of the Nitrate Control Program. The purpose of this evaluation is to determine the pros and cons of applying of a similar approach to salt management given the knowledge gained to date through the implementation of the Nitrate Control Program. This evaluation will include, but may not be limited to, the following:

- Process to establish nitrate Management Zones (timeframes, deliverables, etc.)
- Governance and funding mechanisms that have been implemented within Management Zones

The Contractor will work with the Executive Committee to select five Management Zones for analysis. These Management Zones should be distributed among both Priority 1 and Priority 2 groundwater basins/subbasins in the Central Valley Region. The Contractor will meet with the entities managing each selected Management Zone and Central Valley Water Board staff to develop an understanding of pros and cons of this management approach and lessons learned over time.

Task 3.1.3.2 – Assess Potential Applicability of a Management Zone Approach to Manage Salt

The Contractor will evaluate the developing Preferred Salt Management Alternatives for the SMRs and assess the potential to cross-apply the Nitrate Control Program Management Zone permitting approach to the management of salt within an SMR over the long term but in particular during Phase II of the Salt Control Program. This assessment will take into account the findings from Task 3.1.3.1 and the nature of the salt management alternatives being developed within SMRs. The Contractor will prepare recommendations for CV-SALTS Executive Committee consideration. If use of a Management Zone approach is a viable option, the Contractor will identify any recommended modifications to the existing Management Zone approach to tailor the permitting approach to salt management.

Deliverable (Tasks 3.1.3.1 and 3.1.3.2): Draft and final technical memoranda that summarizes the findings for each task and provides recommendations for Executive Committee consideration.

Task 3.1.4 Policy Discussions to Support Development of Preferred Salt Management Alternatives for SMRs

The CV-SALTS Executive Committee will develop facilitate discussions on policy issues expected to arise as a result of implementation of the Workplan. These discussions will be conducted in a timely manner to support implementation of relevant Workplan tasks. The Contractor will assist the Executive Committee as requested to develop materials to support the discussion, e.g., preparation of white papers to on various topics or the compilation of data needed to facilitate decision-making. Examples of the types of policy issues where
discussion may be needed or information gathered to guide the work of Contractors on other tasks include, but may not be limited to:

The CV-SALTS Executive Committee will facilitate discussions on policy issues expected to arise as a result of implementation of the Workplan. These discussions will be conducted in a timely manner to support implementation of relevant Workplan tasks. The Contractor will assist the Executive Committee as requested to develop materials to support the discussion, e.g., preparation of white papers to on various topics or gather data needed to facilitate decision-making. Examples of the types of policy issues where discussion may be needed or information gathered to guide the work of Contractors on other tasks include, but are not be limited to:

- What is the goal in optimizing extraction well locations for salinity? Removing as much mass as possible? Or strategically improving groundwater aquifers to protect or restore beneficial uses such as MUN and AGR, especially for salinity-sensitive crops. Or a combination of these or other goals.

- What is an appropriate approach to address groundwater basins and watersheds outside the Central Valley Floor; e.g., these areas could be grouped into a single, noncontiguous SMR for subsequent analyses. For areas where TDS is less than 500 mg/L, it may be appropriate to only periodically monitor and not include these areas in the development salt management plans for implementation in Phase II.

- Do the Central Valley Region stakeholders have a fair and equitable prioritization scheme for what water is to be treated or otherwise managed: POTW effluent, industrial and food processing wastewater, brackish water from oil and gas (O&G) activities, agricultural drainage water, groundwater?

- Treated (product) water will be low in TDS (60 to 100 mg/L). It may be appropriate to develop a policy to determine how the product water will be used. For example, should the treated water be blended with a sidestream of untreated water to meet a target TDS that is protective of beneficial uses, e.g., the most salt-sensitive crop? For this scenario, not treating the entire stream of water will increase the volume of useful water and reduce costs. Policy to retain product water in the Central Valley?

- A corollary policy question may be, who will be served with the product water from the treatment facility, or how will the excellent quality treated water be equitably distributed among users? One option is to utilize the treated product water blended for agricultural irrigation. A second option is to recharge the treated water via indirect potable recharge (IPR); however, this option reduces the number of times that water would be used. A third option would be to use advanced water treatment and, at some point in the near future, serve the final treated water for direct potable consumption.

- Discussion of post-Phase I permitting policies to support permitting under Phase II.
Deliverables: Draft and final white papers or technical memoranda for use by the Executive Committee to support policy discussions.

Task 3.2 – Source Control Best Management Practices and Land Management

Salt management practices that reduce salt contributions to groundwater and surface water fall into two general categories:

- **Source Control BMPs** - Source control BMPs manage or limit anthropogenic sources of salt. A number of source control BMPs have been developed to provide management and engineering guidance to limit salt and other constituents from entering surface water and the soil/groundwater system. BMPs that reduce salt at the source can be a more efficient means of salt reduction than treating salt in pumped groundwater. BMPs provide the scientific and engineering basis and methods for controlling salt at the point of introduction into the natural system. BMPs help to achieve regulatory compliance and contribute to economical and sustainable solutions to salinity issues. BMPs for salinity control have been developed for various sectors in California’s economy, including: irrigated and non-irrigated agriculture, food processing, municipal (for example, programs that restrict or ban self-regenerating water softeners), oil and gas, and various other industries.

As an example, the Central Valley Water Board is implementing the “…Irrigated Lands Regulatory Program (ILRP) [which] was initiated in 2003 to prevent agricultural runoff from impairing surface waters, and in 2012, groundwater regulations were added to the program. Waste discharge requirements (also known as "WDRs" or "Orders"), which protect both surface water and groundwater, address irrigated agricultural discharges throughout the Central Valley.” As required by the ILRP, growers are required to prepare farm evaluation plans. The farm evaluation plans include sections on wellhead protection, abandoned wells and irrigation and cultural practices for managing sediment and erosion.

- **Land Management** - Land management activities help to manage naturally-occurring salts from being leached from saline soils and marine sediments through irrigated agriculture, potentially impacting surface waters and groundwater. Land management is a critical component of the overall salt management spectrum in the Central Valley Region. The soils on the west side of the San Joaquin Valley are composed of marine sediments and are naturally saline. Irrigated agriculture leaches these salts (and trace elements like selenium) into the perched zone above the Corcoran clay and into groundwater. Strategic land retirement can reduce the overall salt loading to groundwater in the Central Valley Region. According to the US Bureau of Reclamation (USBR 2008) land retirement: “…would consist of real estate interests that would be acquired through the purchase of non-irrigation covenants that restrict using irrigation water but permit the land to be used for grazing, fallowing, and dryland farming. Land retirement is considered a feature of

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9 https://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/
drainage service because it reduces contributions of water to the shallow groundwater table.” The Central Valley Project Improvement Act (CVPIA)\textsuperscript{10} authorizes the purchase of land and water from sellers who receive water from the Central Valley Project (CVP). The USBR is conducting a Land Retirement Demonstration Project (LRDP) at two sites: Western San Joaquin Valley and the Tulare Lake Basin in order to ascertain the impacts of land retirement of areas where salinity is high. Data from the LRDP will be used to inform decisions regarding implementation of land retirement at larger scales as a means to address agricultural drainage problems in the San Joaquin Valley.

Salt management practices and BMPs that minimize the impact of salinity on groundwater are currently being implemented through reporting and the issuance of orders. The USBR is determining areas where land management/land idling will be beneficial in reducing salt loads to groundwater. The following activities will be performed under Task 3.4.

**Task 3.2.1 - Coordinate with Representatives of Economic Sectors to Catalog Source Control BMPs**

The Contractor will plan and conduct meetings and phone calls with key representatives of various economic sectors including municipalities, industries, food processing, confined animal feeding operations, and agriculture to identify current BMP practices and their efficiencies. In working with these representatives - and through literature reviews - the Contractor will develop a description of the state-of-the-science of BMPs and estimate the reduction of salt load into the environment through the use of these BMPs.

The Contractor will evaluate the potential for improvements in the efficiencies of source control BMPs in the future (e.g., over the next 10 to 20 years). The Contractor will also review the status of new BMPs that are in the development phase but could be considered as source control BMPs for future implementation in the SMRs. The Central Valley Water Board will, as a stakeholder, offer their perspective on source control BMPs and effectiveness.

**Task 3.2.2 Coordinate with the US Bureau of Reclamation and other Entities Considering Land Management Activities to Reduce Salt Loads**

The Contractor will meet with the USBR, Department of Water Resources (DWR) and other agencies and stakeholders to identify proposed land management projects and evaluate their potential usefulness for inclusion in an SMR alternative. The Contractor will develop GIS shapefiles delineating areas under consideration for land management. DWR’s agricultural land-use tool can be used to determine which areas are temporarily fallow and potentially which areas have been retired. The Contractor will describe the land management projects in

\textsuperscript{10} Enacted in 1992 as Public Law 102-575 Title 34, Section 3408(h).  
https://www.usbr.gov/mp/cvpia/3408h/index.html
detail and will estimate the reduction of salt load into the environment through the implementation of these projects.

**Deliverables:** Draft and final technical memoranda describing the state-of-the-science BMPs and the reductions in salt load that can be achieved by deploying these BMPs. The technical memoranda will also include an analysis of areas that are under consideration for land management and the reduction in salt load as a result of land management.

**Task 3.3 – Numerical Salt Management Tool Development**

In this task, the Contractor will be responsible for the development of a combined numerical surface water and groundwater model (or models) that tracks water supply and water demand, identifies sources of salinity, and models the movement of water and salts within the Central Valley and to and within the production zone of each SMR. From a water balance perspective, the model(s) must address subsurface inflows and outflows, groundwater extraction, surface water interdependencies, stream discharge, groundwater recharge (stormwater / dry weather capture and recharge, imported water recharge, recycled water recharge, and streambed recharge), POTW and industrial discharges, deep percolation of precipitation, deep percolation of applied water (urban and agriculture), and consumptive use by crops.

The objectives of the numerical Salt Management Tool (SMT) include:

- Provide support for water managers and P&O Study stakeholders to effectively understand and manage groundwater basins and watersheds; hence, horizontal and vertical discretization must be at a fine enough level to make appropriate water management decisions.

- Perform a salinity balance at the groundwater basin, watershed, and SMR scales.

- Develop a numerical SMT that will be able to demonstrate the effect of implementation of various salt management alternatives in achieving salinity balance (Task 4.4). The SMT will be used to assess and rank various non-physical and physical projects that will be combined to develop proposed salt management alternatives.

- Optimize certain elements within each alternative. As an example, the effect of the locations of proposed groundwater extraction wells could be modeled and refined until the locations are considered optimized, based on agreed-upon criteria.

The development of the numerical SMT includes the following subtasks:

**Task 3.3.1 - Coordinate with the GSAs**

The Contractor will coordinate with the GSAs concerning hydrogeological conceptual models (HCMs) and surface water / groundwater models that have been developed or are in development or refinement as required by SGMA. To the extent possible, the Contractor will collaborate with the GSAs in order to not duplicate effort and to ensure consistency in the development of basin management tools. The Contractor will provide a technical overview of
the SGMA HCM and groundwater / surface water models and will develop a draft report for the TAC and Executive Committee suggesting potential changes or improvements to the SMT that would better serve the purposes of the P&O Study.

Task 3.3.2 – Develop and Refine a Hydrogeologic Conceptual Model Applicable to Each SMR

An HCM provides a conceptual understanding of the physical characteristics of a watershed(s) and groundwater basin(s), including the regional hydrology, current and projected land uses, and geology. Furthermore, the HCM summarizes the general understanding of the physical setting, characteristics, and processes that govern surface water and groundwater occurrence within the basin. The HCM provides the framework to develop water budgets, mathematical models, and monitoring networks.

The Contractor will rely on the considerable data, analysis, and interpretation that has already been accomplished through the Initial Analysis Zone (IAZ) model developed by CV-SALTS (2013). In addition, as part of the Groundwater Sustainability Plans (GSP) developed for most Management Zones established under SGMA, the GSAs have developed or are in the process of developing HCMs. In building an HCM at the SMR-scale, the P&O Contractor will use information from the HCMs developed by GSAs at the scale necessary under SGMA.

At a minimum, the Contractor will include the key elements of DWR’s HCM BMP manual prepared to support SGMA (DWR 2016a):

- Regional geologic and structural setting of the basin
- Lateral basin boundaries, including major geologic features that significantly affect groundwater flow
- Bottom of the basin
- Principal aquifers and aquitards, including the following information:
  - Formation names, if defined
  - Physical properties of aquifers and aquitards, including the vertical and lateral extent, hydraulic conductivity, and storativity
  - Structural properties of the basin that restrict groundwater flow within the principal aquifers
  - General water quality of the principal aquifers
  - Identification of the primary use or uses of each aquifer, such as domestic, irrigation, or municipal water supply
- Surface water and groundwater interdependencies
- Identification of data gaps and uncertainty
- Scaled cross-sections sufficient to depict major stratigraphic and structural features in the basin
- Maps depicting physical characteristics of the basin:
  - Topographic information derived from the USGS
  - Surficial geology
  - Soil characteristics
  - Delineation of existing recharge areas, potential recharge areas, and discharge areas
  - Surface water bodies
  - Source and point of delivery for imported water supplies

The Contractor will develop draft and final reports that describe the HCM developed for each SMR in order to support the P&O Study.

**Task 3.3.3 - Selection of Modeling Platforms**

DWR (2016b) states: “Models provide insight into the complex system behavior and (when appropriately designed) can assist in developing conceptual understanding. Models provide an important framework that brings together conceptual understanding, data, and science in a hydrologically and geologically consistent manner.” The SMT can be either a coupled groundwater and surface water model, or a fully-integrated hydrologic model. A solute transport model will utilize output from the groundwater flow model to model salt movement in the model domain. The SMT’s platform will be one or more public domain and accepted software programs, e.g., C2VSIM, IWFM, MODFLOW, GSFLOW, MODBRNCH, MODFLOW/DAFLOW from the USGS, Central Valley Hydrologic Model (CVHM) from the USGS, Hydrological Simulation Program - FORTRAN (HSPF) from the USEPA, WARMF, etc. The Contractor will consider the following when developing a recommendation for the selection of modeling platform (DWR 2016b):

- Groundwater and surface water models will meet the following standards:
  - Publicly-available supporting documentation
  - Based on field or laboratory measurements
  - Public domain open-source software
- Best available information and best available science to quantify the water budget for the basin.

It is assumed that DWR will provide the California Central Valley Groundwater-Surface Water Simulation Model (C2VSIM) and the Integrated Water Flow Model (IWFM) for use in developing the water budget. The Contractor will document the rationale for the selection of model platform(s) as part of the Task 3.5.6 Model Technical Memorandum.
Task 3.3.4 - Technical Review Panel – Selection of the Model Platform

A Technical Review Panel (TRP) will be selected and convened to provide an independent review of the selection of the modeling platform to ensure its suitability for the intended purposes of the P&O Study. The TRP, consisting of a minimum of three recognized experts in surface water / groundwater modeling and or salinity issues, will provide the review of model platforms for each SMR. Consistency in the choice of model platforms will be considered a plus, unless SMR-specific issues support a different choice of model platforms. The model platform will not be accepted for use to support the P&O Study without concurrence from the TRP.

Task 3.3.5 - Model Calibration

The flow and transport models must be calibrated for both steady-state and transient conditions. The objective of model calibration is to demonstrate that the model can adequately replicate historical conditions, prior to using the model in a predictive (forward-looking) manner. Model parameters may be adjusted – constrained within the range of reasonable values - until calibration criteria are met.

Task 3.3.6 - Model Technical Memorandum and Documentation

The Contractor will prepare an SMT Technical Memorandum, documenting the development of the SMT. The memorandum will describe the model conceptualization, the model domain, documentation of model platforms and codes. Input and output files will also be provided electronically, along with the calibration results. Pre- and post-processing tools, visualization codes, and GIS shapefiles and simulations will also be provided as an electronic appendix to the SMT Technical Memorandum. All data and software developed by the Contractor will remain the property of the CVSC. The SMT Technical Memorandum will be submitted for technical review under Task 3.5.7.

Task 3.3.7 - Technical Review Panel – Peer Review of the SMT

The TRP will be reconvened to peer review the SMT to ensure that it meets professional standards of practice. The TRP will review the model documentation prepared under Task 3.3.6. In particular, the TRP will assess how well the numerical model simulates water and salt transport and occurrence. Any new code written for this project, e.g., coupling of surface water and groundwater will be technically evaluated by members of the TRP.

The TRP will provide a written assessment of the SMT; the Contractor will respond to the assessment with a brief report that explains any issues highlighted by the TRP. Revisions will be made to the SMT, if necessary to address TRP comments. The TRP comments and response from the Contractor will be included as an Appendix to the SMT Technical Memorandum. The SMT will not be accepted for use to support the P&O Study without concurrence from the TRP.

Deliverables (all 3.3 subtasks): The Contractor will complete the following deliverables:

- Technical review/report of the SGMA groundwater / surface water models
Task 3.4 – Special Studies

Table 1-1 defined the Phase I P&O Study Milestones, based on Table S-2 in the Salt Control Program (see Section 1). This table specifies special studies to include:

- Stormwater Recharge Master Plan Study
- Recycled Water Imports Study
- Emerging Technical Updates (every 5 years)
- Groundwater Quality Trace Constituent Study

The tasks below describe the work required to complete these studies. The Stormwater Recharge Master Plan and Recycled Water Imports studies are combined in this Workplan.

Task 3.4.1 – Central Valley Region Groundwater Recharge Projects

Groundwater recharge projects are critical elements of both water and salt sustainability -- salinity management is necessarily and fundamentally coupled with water management. Managed aquifer recharge (MAR) projects increase groundwater storage and can improve ambient water quality in groundwater. As part of the P&O Study, the Contractor will review and analyze existing and proposed groundwater recharge projects at the SMR scale, while looking for opportunities to holistically manage salinity in conjunction with neighboring SMRs. Groundwater recharge projects include the following:

- Stormwater recharge projects
- Recycled water recharge projects
- Imported water recharge projects

Groundwater recharge projects have multiple benefits - they contribute to a more reliable and sustainable local water supply and can improve ambient groundwater quality, provided that the TDS of the recharged water is less than the water in the underlying groundwater basins and recharge volumes are substantial. Capturing and recharging dry weather flow and stormwater improves water quality by removing pollutants, including pathogens and trace metals through soil aquifer treatment (natural treatment process that removes some pollutants as water passes through soil, the vadose zone, and within an aquifer) (State Water Board 2013). In addition, the TDS concentration of stormwater is typically very low and therefore recharging stormwater not only increases storage, but also may improve water quality of the underlying aquifer.

The identification and evaluation of groundwater recharge projects as a component of a preferred salt management strategy will be an important component of the effort to identify potential physical projects to address the sustainability gap identified within an SMR (see
These projects often share facilities due to capital and operations and maintenance (O&M) costs, preferred locations, and hydrogeological considerations. Imported water and stormwater can be used as diluent supplies for recycled water recharge projects.

In Task 3.4.1, the Contractor will evaluate the locations of existing and proposed groundwater recharge projects in the Central Valley Region. It is anticipated that groundwater recharge projects will be identified and evaluated by GSAs under the Sustainable Groundwater Management Act (SGMA), necessitating close cooperation and coordination between CV-SALTS and GSAs. Furthermore, the Contractor will review and evaluate existing and proposed recharge methods, including:

- Surface water spreading basins
- Injection wells (groundwater and vadose zone)
- Aquifer storage and recovery wells
- Flood-MAR projects\(^\text{11}\)
- Streambed recharge

The intended outcome of Task 3.4.1 is to quantify groundwater recharge within each SMR. This outcome will not only benefit water quality and thus reduce the sustainability gap, but also increase groundwater elevations and increase aquifer storage. The optimal volume of groundwater recharge within an SMR will be determined by utilizing the SMT (see Task 3.3 and Task 4.4.2). An array of locations, capacities, and recharge methods will be evaluated to prepare a recharge technical memorandum for each SMR that identifies opportunities for recharge projects with the SMR that benefit salt management. Following are the specific subtasks to be implemented to develop these technical memoranda.

**Task 3.4.1.1. Evaluation of GSA Plans for Recharge**

The Contractor will coordinate with the GSAs concerning existing and proposed groundwater recharge projects in the SMR that are described in the GSPs prepared by the GSAs. The assumption is that the GSAs are currently developing project plans for groundwater recharge. So as to not duplicate effort, the Contractor will not develop new groundwater recharge projects concepts, but rather will evaluate major identified groundwater recharge projects regarding their potential to benefit salt management needs.

\(^{11}\) "‘Flood-MAR’ is an integrated and voluntary resource management strategy that uses flood water resulting from, or in anticipation of, rainfall or snowmelt for managed aquifer recharge (MAR) on agricultural lands, working landscapes, and managed natural landscapes, including but not limited to refuges, floodplains, and flood bypasses...The potential benefits of this [strategy] are significant: groundwater replenishment, peak flood flow attenuation, additional values and uses for agricultural land, a potential source of instream flows during drought or other periods of critical environmental need, and finally, increased efficiencies from reservoir reoperation.” (DWR 2019)
within SMRs. As part of this evaluation, the Contractor will note any potential modifications to GSA-planned projects that could be of mutual benefit to the GSA and SMR.

**Deliverables:** Draft and final technical memoranda that summarize the findings from this evaluation of groundwater recharge for each SMR.

**Task 3.4.1.2 – Enhancement of Sources of Water for Recharge**

The GSAs have or are developing groundwater recharge projects. In this task, the Contractor will focus on identifying potential additional sources of water that may be used to increase groundwater recharge within SMRs (to the extent they may be available given water rights implications). Specific subtasks described below are proposed to be implemented by the P&O Contractor only if the GSAs have not already considered these potential sources of water for recharge.

**Task 3.4.1.2.1 - Stormwater Recharge Potential**

In this subtask, the Contractor will determine the amount of stormwater potentially available for recharge within watersheds draining to the SMR, accounting for other uses of water based on water rights and water diversions. In addition to reviewing relevant planning and water management information, the Contractor will work with the Division of Water Rights to investigate water rights in streams, reservoirs, and groundwater.

**Task 3.4.1.2.2 - Evaluation of Reservoir Operations to Facilitate Groundwater Recharge**

The Contractor will conduct a high-level review of existing reservoir operational procedures to evaluate the potential to modify reservoir operational requirements to allow for an increase in water available for groundwater recharge, while still meeting flood control requirements. To facilitate this review, the Contractor will meet with agencies (e.g., County Flood Control Districts, DWR, and US Army Corps of Engineers) responsible for reservoir operations within areas that impact surface water flows within SMRs to understand current and projected reservoir operations.

**Task 3.4.1.2.3 – Water Transfer Projects**

Water transfers between willing sellers and willing buyers is a tool that is currently being used to convey water to areas of critical need during drought and non-drought periods. Hundreds of water transfers are executed each year, with most of the water transfer projects occurring between agriculture users in the same groundwater basin. There may also be opportunities to wheel water from north of the Delta to the Central Valley Region, “Any transfer of non-project water requiring conveyance through Project Agencies’ facilities will require a ‘conveyance agreement’ or a ‘letter agreement’ with the transfer proponent, the buyer, and either DWR or Reclamation.” (DWR and USBR 2015). Under this task, the Contractor will compile and catalog water transfers that bring new water into the Central Valley Region and inter-SMR transfers. As part of this effort, it is critical for the P&O Study that the water quality impacts from water transfers be understood and be modeled using the numerical SMT (Task 3.3).
Deliverables (Subtasks 3.4.1.2.1 through 3.4.1.2.3): Draft and final technical memoranda that evaluate the potential to enhance groundwater recharge from stormwater, modification of reservoir operations, or water transfer projects.

Task 3.4.1.3 – Initial Siting of Groundwater Recharge Projects in SMRs
Considering the findings from Task 3.4.1.1 (GSA-planned recharge projects), the Contractor will determine optimal locations for the siting of additional groundwater recharge projects within SMRs (if any). At each proposed location, the Contractor will evaluate the efficacy of an array of recharge methods, including: surface water spreading basins, injection wells (groundwater and vadose zone), ASR wells; flood-MAR projects, streambed recharge.
Groundwater recharge project proposed locations will be based on the following physical conditions:

- **Hydrogeology, Pumping Patterns, Well Yield, Pumping Sustainability** - The HCM prepared for each SMR in Task 3.3, provides a conceptual understanding of the physical characteristics of a groundwater basin, including the regional hydrology, current and projected land uses, and geology. The HCM provides the framework to develop water budgets, mathematical models, and monitoring networks. The HCM and SMT will be used to propose suitable locations for groundwater recharge projects, including estimates of infiltration and capacity for various recharge methods. Groundwater recharge projects are typically located upgradient of wellfields, especially those with declining groundwater elevations. In addition to location, the underlying hydrogeology may determine the proposed groundwater recharge methods. For example, a given location for a proposed recharge site may not be a good candidate for surface spreading because of low infiltration rates in near surface soils but may be a good candidate for injection wells or ASR wells. The Contractor will use the calibrated SMT to estimate well yield and pumping sustainability.

- **Stream Course** - Groundwater recharge basins are typically located near stream courses for two reasons: (a) it reduces the length of water conveyance systems; and (b) the underlying sediments near streams are typically coarser and infiltrations rates are higher. The Contractor will identify principal stream locations, including channels and will provide updated GIS shapefiles.

- **Aquifer Forebay Areas** - Groundwater basins have forebay areas where natural recharge occurs. Groundwater recharge projects are typically located higher in the groundwater basin in the forebay areas. The Contractor will determine areas of recharge and areas of discharge in each groundwater basin.

- **Recycled Water Recharge** - Recycled water recharge projects must satisfy retention time requirements for soil aquifer treatment (SAT) for tertiary-treated effluent (State Water Board 2018). If retention time requirements cannot be met, for example if potable supply wells are located too close to the proposed groundwater recharge basin, the project proponent may consider Advanced Water Treatment (AWT). Recycled water recharge projects with AWT will have shorter retention time requirements.
Deliverable: Preliminary list of potential groundwater recharge projects locations within SMRs based on physical conditions.

Task 3.4.1.4 – Refinement of Potential Groundwater Recharge Project Locations

Based on the outcome of Task 3.4.1.3, the Contractor will further refine the potential list of groundwater recharge project locations by evaluating the following factors:

- **Land Acquisition** - The Contractor will determine areas where suitable lands can be acquired at reasonable costs and will ensure that the proposed site is large enough and in the appropriate configuration for a potential recharge project, including the conveyance system and O&M requirements.

- **Groundwater Quality Issues** - The Contractor will review available groundwater quality data, including data compiled in Task 3.4.3 and Task 4.2.1. The Contractor will use GIS in conjunction with GeoTracker to ascertain the locations of point source groundwater quality issues, including areas that are undergoing groundwater remediation. Groundwater recharge projects would not be proposed in these areas, in order to not interfere with ongoing mitigation measures.

Deliverables: Draft and final technical memoranda that identify ideal locations for groundwater recharge projects based on all factors evaluated and utilizing work products already developed by the GSAs, to the extent possible. These technical memoranda will provide input to Task 4.

3.4.2 - Mature and Emerging Technologies for Salinity Treatment

Mature desalination technologies can be largely divided into two categories: membrane-based technologies and thermal technologies. The membrane-based technologies includes Reverse Osmosis (RO) and Electrodialysis Reversal (EDR). RO is the most widely used process to reduce dissolved solids from many different sources of water. In the RO process, water from a pressurized saline solution is separated from the dissolved salts by a semi-permeable membrane. The water is forced to flow through the semi-permeable membrane by the pressure differential created between the pressurized feed water and the product water. RO is well verified in the field with numerous applications installed and operating for many years throughout the world and it would be an applicable technology to reduce TDS from high salinity source waters in the Central Valley Region. RO treatment capacity is easily scalable with modular system designs from less than 1 million gallons per day (mgd) to more than 100 mgd.

In certain circumstances, RO can achieve more than 95 percent salt reduction. However, RO has a limited recovery of 85 to 90 percent in typical brackish water applications and handling of the RO brine generated with 10 to 15 percent of feed volume is the critical issue to deal with for the implementation of RO.
Thermal desalination technologies include thermal evaporation and crystallization among other technologies. The thermal processes can typically achieve much higher recovery than reverse osmosis and generate highly purified water. However, the thermal processes are energy intensive and have very high operational costs. The operational cost of thermal evaporation processes is more than four to five times higher per acre-foot than the cost of membrane-based processes. A thermal evaporator combined with a crystallizer has been used to achieve a Zero Liquid Discharge (ZLD) system. ZLD is particularly applicable where solar evaporation pond construction is not feasible due to high construction costs, low evaporation rates, or limited treatment facility footprint.

Mature desalination technologies such as RO and EDR have worked well in various applications. However, the technologies produce significant volumes of brine waste with normal operation recoveries for single pass systems of 85 to 90 percent. Other new desalination technologies are being pilot tested with claims that these new systems can be operated at much higher recovery rates, thereby reducing the volume of the brine and concomitantly the brine management costs. Examples of emerging desalination technologies are included below\textsuperscript{12}: and detailed descriptions of these technologies are found in the SSALTS Phase 3 Final Report (CV-SALTS 2016).

\begin{itemize}
  \item Forward Osmosis (FO)
  \item Membrane Distillation (MD)
  \item Zero Discharge Distillation (ZDD)
  \item Catalytic Treatment
  \item Graphene Membrane
\end{itemize}

The purpose of this task is to periodically evaluate the status of emerging technologies and their potential use in support efforts to achieve salt sustainability. Findings will provide input to the planning processes for each SMR. This evaluation will occur at least twice during the P&O Study as described below.

\textit{Task 3.4.2.1 – First Evaluation of Mature and Emerging Technologies}

The first evaluation will occur prior to the end of the first five years of the project. The Contractor will use its extensive expertise in salt treatment technologies to review and analyze performance data from pilot- and full-scale desalination facilities utilizing mature and emerging technologies. The Contractor will rely on various tools to identify these facilities for review, e.g., literature search, university research, industry sources, etc. The review will not only look at technological feasibility but other criteria, including, but not

\textsuperscript{12} This list is not meant to be complete or comprehensive, but it does provide examples of currently emerging desalination technologies.
limited to, scalability, capital and O&M costs, energy costs, and use of secondary products
derived from salt (e.g., from a marketability / profit perspective).

Task 3.4.2.2 – Second Evaluation of Mature and Emerging Technologies
The second evaluation will occur prior to evaluation of Salt Management Alternatives for
each SMR. The Contractor will update the findings from Task 3.6.2.1 using similar
resources, e.g., literature search, university research, industry sources, etc. For any
technologies evaluated in the first evaluation that are included in this second evaluation, the
Contractor will not only review the current state of the feasibility of the technology but also
update information regarding scalability and various costs. For newly identified emerging
technologies the Contractor will look at technological feasibility as well as other criteria,
including, but not limited to, scalability, capital and O&M costs, energy costs, and use of
secondary products derived from salt (e.g., from a marketability / profit perspective).

Deliverables (3.4.2): Draft and final technical memoranda describing mature and emerging
salinity treatment technologies. Each technology included in the memorandum will have a
discussion of scalability, costs, and other factors that may impact its usefulness as a treatment
technology in the Central Valley Region.

Task 3.4.3 – Groundwater Trace Constituent Study
For salt management projects that require delivery of a brine stream to a WWTP, it will be
important to evaluate the potential for pesticides, nutrients, metals, and naturally-occurring
trace elements, that could be found in brine streams, to not interfere with a WWTP’s ability
to meet permit requirements for discharge (e.g. discharge to San Francisco Bay or the Pacific
Ocean). For example, some areas with subsurface agricultural drainage have elevated
concentrations of one or more trace elements, e.g., arsenic, boron, hexavalent chromium,
fluoride, molybdenum, selenium, uranium, and vanadium. Other potential CECs may also
need to be evaluated, e.g. 1,2,3-trichloropropane (1,2,3-TCP), perchlorate,
perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA). In addition to
groundwater, the source water for the desalter facility may also include POTW effluent,
industrial effluent, food processing waste streams, oil and gas-generated brine, and
subsurface agricultural drainage.

While there are significant amounts of groundwater quality data currently available, the
analytes are typically focused on TDS, nitrogen species, other nutrients, and major cations
and ions. These data, along with trace element constituents, need be incorporated into a
synoptic groundwater trace element chemistry study targeted for different SMRs where
understanding of trace constituents in the groundwater will be necessary to support the
evaluation of salt management alternatives that involve disposal of a brine stream.

In addition, a study that evaluates additional treatment requirements to reduce trace
constituent concentrations may be necessary to provide understanding of the impact of
identified trace constituents on brine disposal options. The specific treatment technology to
remove identified trace constituents at any given location will depend on the specific elements found, the concentrations, competing ions, soluble ligands, etc. In general, several processes can be considered for the trace constituent removal, such as ion exchange, lime softening, and coagulation/co-precipitation. These processes can be applied either as a pre- or post-treatment to RO in the desalting process.

The purpose of the following tasks is (a) to develop data that provide a general understanding of potential trace contaminant concerns in areas within SMRs where projects may be implemented that will result in the need to dispose of and possibly treat brine concentrate; and (b) to identify and evaluate treatment technologies that may be required to remove trace constituents prior to disposal of the brine (e.g. prior to delivery to a WWTP).

**Task 3.4.3.1 – Compilation of Existing Data**

The Contractor will conduct a literature review to identify papers, reports or studies that document the presence of key trace constituents in groundwater within each SMR. The target of this review will be on the following minimum constituents, but others may be included as recommended by the Contractor or requested by stakeholders: major cations and anions, reactive and total silica, pesticides, nutrients, metals, and naturally-occurring trace elements, including: Arsenic, boron, hexavalent chromium, fluoride, molybdenum, selenium, uranium, and vanadium. Other potential constituents of emerging concern may also need to be evaluated, e.g. 1,2,3-TCP, perchlorate, PFOS, PFOA.

**Task 3.4.3.2 – Sampling and Analysis Plan**

Based on the findings of Task 3.4.3.1, recommendations from the P&O Study stakeholders and the identification of the SMRs developed in Task 4.1, the Contractor will write a Sampling and Analysis plan (SAP) to evaluate the presence and typical concentrations of trace constituents in SMRs. The SAP will recommend required analytes, including those researched in Task 3.4.3.1, and sample locations, including a justification for the vertical and areal distribution of data collection. The frequency and time frame for sampling will be sufficient to evaluate whether the selected analytes are present and, if present, typical concentrations. The SAP will target SMRs, and areas within an SMR, where there is a reasonable expectation for groundwater to be pumped and treated as part of a future salt management strategy. To the extent possible, implementation of the SAP should be coordinated with other routine monitoring programs to reduce labor costs. A draft SAP will be submitted to the TAC for review and comment. A revised draft SAP will be submitted to the Executive Committee and Central Valley Water Board for approval.

**Task 3.4.3.3 – Implement Trace Constituent Sampling Program**

The Contractor will implement the SAP approved in Task 3.4.3.2. Periodic progress reports on the status of the sampling program will be submitted as required by the SAP. Data will be compiled as required by the SAP and submitted to the data repository established for the P&O Study (see Task 2.1.5).
Task 3.4.3.4 – Findings from Trace Constituent Sampling

The Contractor will prepare a draft Technical Memorandum that provides the key findings from the Groundwater Trace Constituent Study and make recommendations for additional research and analysis regarding trace constituent treatment technologies under Task 3.4.3.5. A revised draft memorandum will be prepared for review by the Executive Committee based on TAC comments on the draft. A final Technical Memorandum will be prepared based on Executive Committee comments.

Task 3.4.3.5 – Evaluation of Trace Constituent Treatment Technologies

Based on the outcome of Task 3.4.3.4, the Contractor will prepare a draft Technical Memorandum that evaluates the technology available to treat trace constituents of concern. This evaluation will sufficient to support the analysis of salt management alternatives under Task 4.4. A revised draft Technical Memorandum will be prepared for review by the Executive Committee based on TAC comments on the draft. A final Technical Memorandum will be prepared based on Executive Committee comments.

Deliverables (Task 3.4.3): The Contractor will complete the following deliverables:

- Draft and final Sampling and Analysis Plans.
- Draft and final technical memoranda that documents the findings from the groundwater trace constituent study
- Draft and final technical memoranda that documents the findings from the evaluation of treatment technologies for trace constituents of concern.

4.4 Task 4 – Develop Long-term Salt Management Strategies

The climatic and hydrologic characteristics of the Central Valley Region vary considerably from north to south. Given this reality, it is expected that the best alternatives to manage salt to achieve sustainability will vary significantly across the Region. As a corollary, it is also assumed that the need for physical projects and the numbers and types of physical projects recommended for implementation will also vary across the Region. These assumptions provide the foundation for the approach for identifying physical projects through the P&O Study. Specifically, the Central Valley Region will be subdivided into appropriate planning areas, i.e., SMRs, for development of a preferred salt management strategy that leads to salt sustainability. For each SMR, potential physical projects will be identified where needed to supplement other ongoing or already planned salt management activities. Selected projects may range from local projects to address a local concern to regional projects that may be implemented collaboratively with other SMRs. The outcome of this effort will be a Phase II Implementation Plan for each SMR.

Section 2 provided a stepwise summary of the process that this Workplan will implement to identify physical projects. Figure 4-1 expands on this summary by providing a detailed
illustration of the workflow that will occur under Task 4. Task numbers are included in Figure 4-1 to provide linkages to where related supporting work occurs in this Workplan.

**Task 4.1 – Develop Salt Management Planning Areas**

Two types of planning areas need to be identified within Central Valley Region:

- **Salt Management Regions** – SMRs are delineated for the development of region-specific salt management strategies to achieve salt sustainability. An SMR is defined as a contiguous geographic area for the development of a region-specific strategy for sustainable salt management. An SMR can be an entire California DWR hydrologic region, e.g., the Sacramento River Hydrologic Region. An SMR may also be a subset of a hydrologic region, e.g., the San Joaquin River hydrologic region could be divided into a Westside San Joaquin Valley and an Eastside San Joaquin Valley. If a hydrologic region is to be divided into smaller SMRs, the division should be aligned with DWR Bulletin 118 groundwater basin boundaries that have been updated for SGMA.

- **Salt Management Areas (SMAs)** – These are regional or subregional salt sinks that can be used to manage salt accumulation within an SMR. The BPA defines these areas as follows: A defined groundwater basin or sub-basin that can be used to receive and contain water with elevated salinity concentrations in order to remove the salt from sensitive areas until such time that the collected salts can be removed from the area for disposal or use.

Identification of these two types of planning areas is described by the following subtasks.

**Task 4.1.1 – Develop Salt Management Regions**

**Task 4.1.1.1 – Select Salt Management Regions for the P&O Study**

The Contractor will work with the CV-SALTS Executive Committee to establish criteria for the creation of SMRs for the Central Valley Region. At a minimum, it is expected that there will be at least three SMRs for the Central Valley Floor, consistent with the following DWR hydrologic regions: Sacramento River, San Joaquin River and Tulare Basin. Discussions with the Executive Committee will focus on whether to subdivide these areas further, e.g., subdividing the San Joaquin River into east and west sides of the basin or into one or more combinations of river subwatersheds.

To address areas outside the Valley Floor, the Contractor will work with the CV-SALTS Executive Committee to evaluate the need for development of a Phase II Implementation Plan for these areas. It may be appropriate to remove many of these groundwater basins from subsequent analyses because they have good water quality and no concerns regarding salt buildup. For groundwater basins where salt sustainability planning is determined necessary the Contractor will develop options, e.g., combine all groundwater basins outside of the Valley Floor into a single SMR for subsequent analysis, or include analyses for specific out of the Valley Floor groundwater basins with the nearest Valley Floor SMR.
Figure 4-1. Task 4 Workflow to Develop a Preferred Salt Management Alternative Appropriate for Each SMR
The development of recommendations for establishment of SMRs will consider a number of factors including, but not necessarily limited to:

- Likely salt management target(s) for the area (see Task 3.1.1);
- Manageability of the area, e.g. it may be easier to achieve sustainability in smaller areas than larger areas;
- Sources of salt, e.g., areas with natural salt sources may need to be managed differently than areas with such sources;
- Degree of independence among potential subdivisions with regard to water and salt management or movement, or other relevant factors.

Based on the selected criteria, the Contractor will develop a draft recommendation for the establishment of SMRs. This draft recommendation will include sufficient technical justification to facilitate review by the TAC and Executive Committee. Based on comments received, a final SMR recommendation will be submitted to the Executive Committee for approval.

**Deliverables:** Development of criteria for establishing SMRs for the Central Valley Region; draft and final technical memoranda that establishes SMRs for use in subsequent tasks.

**Task 4.1.1.2 – Compile Data and Information for Selected Salt Management Regions**

The purpose of this subtask is to collect and compile the available data, studies and reports that will be used in subsequent tasks designed to characterize the SMRs approved under Task 4.1.1.1. The bulk of baseline data compilation for each SMR will occur under this subtask; however, this baseline data set will be updated as needed during subsequent tasks if new or updated, relevant data become available. Data will be compiled in the following areas:

- **Physical Attributes** - Hydrogeology, surface water features, water balance (e.g., surface water and groundwater hydrology), land cover, soils, topography, water quality and other relevant physical features. The CV-SALTS GIS framework will also be used as appropriate to support the compilation of data under this subtask.

- **Land Use Attributes** - Compile land use information to provide a basis for evaluating how land uses may affect salt accumulation in the SMR. The most currently available land use coverages will be obtained. This effort will be consistent with ongoing efforts by GSAs to identify land use within their respective areas (e.g., DWR has developed the California Land Use Viewer [https://gis.water.ca.gov/app/CADWRLandUseViewer], which allows GSAs and the public to easily access both statewide and county land use datasets that have been collected over the last 30 years.

- **Institutional, Economic, and Regulatory Attributes** - The overlying institutional, economic and regulatory attributes of each SMR will be compiled. Understanding these attributes will be important for developing and evaluating SMR-scale salt management
strategies. Relevant information associated with each type of attribute that may affect how water/salt are managed includes, but may not be limited to:

- **Institutional** – Information about municipal wastewater collection systems, water management districts, agricultural irrigation districts, flood control districts, industrial facilities, city/county planning and zoning agencies or other agencies, that provide understanding regarding how water/salt is transported, used or managed within the SMR.

- **Economic** – Economic impacts of changes in water quality, water supply, production of goods and services, income, and employment due to salinity in various economic sectors including municipal and industrial water treatment, food processing, confined animal feeding operations, and agriculture.

- **Regulatory** - Permitted dischargers and existing discharge requirements, compliance with beneficial uses, water quality objectives, water rights, or other regulatory factors that potentially impact water/salt management within an SMR. Included in this area will be incorporating requirements to manage climate change consistent with current state policy at the time of the P&O Study.

- **Other Technical Resources** – Identify any other existing studies, reports, analyses, models (e.g., CV-SALTS Conceptual Model, WARMF, MODFLOW, IGSM, and CVHM) that are available for the SMR that may be used to support the P&O Study or may be mined to provide additional information to characterize each SMR.

**Deliverables:** Draft and final technical memoranda that provide an annotated and tabular summary of the data and information collected for the SMR. The tabular summary will include, but may not be limited to:

- Data type (e.g., shapefile, Access database, spreadsheet, report, etc.)
- Data source (California Environmental Data Exchange Network [CEDEN], Groundwater Ambient Monitoring and Assessment [GAMA], specific contributor, etc.),
- Date acquired (e.g., if from a database, the date when the data were downloaded).
- Description of the data and its intended use for the SMR
- Timeframe for which the data are applicable (e.g., range of years), repository for the data.
- Contact information for the Contractor that acquired the data
- Repository for the data (where are the data currently located and accessible)

The technical memoranda will (a) include an electronic attachment of all data and information acquired for each SMR; and (b) identify additional information sources that the Contractor is aware of that may be relevant to the SMR, but for which a copy of the data was not able to be obtained. The Contractor will work with the TPM to upload the information compiled for each SMR into the central data repository maintained for the P&O Study (see Task 2.1.5).
**Task 4.1.2 – Identify Potential Salt Management Areas**

The Contractor will identify potential locations that may serve as an SMA as defined by the Basin Plan amendment (see above for definition). An SMA may include either an area within a groundwater basin where one or more beneficial uses (e.g., MUN and AGR) have already been de-designated due to elevated salinity, or it may be an area where de-designation may be recommended in the future through completion of the appropriate regulatory process. The following subtasks will be completed under the P&O Study.

4.1.2.1 – Establishment of a Salt Management Area in an Area with MUN and AGR Beneficial Uses De-Designated

The number of existing areas where MUN and AGR have been de-designated in the Central Valley Region is limited (Central Valley Water Board 2015, 2016, as amended) with the most recent de-designation occurring in a portion of the groundwater subbasin underlying the Tulare Lake Bed (Resolution No. R5-2017-0032; approved by State Water Board 2017-0048). Under this Task the Contractor will develop recommendations for establishment of one or more SMAs within the Central Valley Region. This effort will include the following activities:

- Evaluate the potential for establishment of an SMA within an area where MUN and AGR have already been de-designated.
- Work collaboratively with potentially affected entities within the area where an SMA could be established to identify acceptable locations for salt disposal.
- If local stakeholder support exists to establish an SMA, the Contractor will develop the necessary regulatory, institutional and technical documentation to support establishment of an SMA. This effort will require close coordination with the CV-SALTS Executive Committee and Central Valley Water Board staff to ensure that the appropriate technical documentation is developed to support the required regulatory approval process to establish the SMA. For example, the Contractor will need to demonstrate how the salt delivered to the disposal site will be contained and will not adversely affect other waterbodies (surface water or groundwater) or other natural resources.\(^\text{13}\)

**Deliverables:** Draft and final technical memoranda that identify location(s) recommended for establishment of an SMA. The memoranda will include the documentation required to support the regulatory approval process to establish the SMA. If no areas are identified, the technical memoranda will summarize the work completed in the task and the findings.

**Task 4.1.2.2 – Establishment of a Salt Management Area in an Area Designated with MUN and AGR Beneficial Uses**

\(^\text{13}\) It is unknown at this time what kind of regulatory process would be needed to establish an SMA consistent with the intent of the Salt Control Program
SMAs would only be established where MUN and AGR have been de-designated in a groundwater basin/subbasin. Candidate locations would be areas where the underlying groundwater meets the criteria for de-designation of MUN and AGR, consistent with State Water Board’s Sources of Drinking Water Policy (88-63) and the adoption of the Basin Plan amendment to remove MUN and AGR from groundwater underlying a portion of the Tulare Lake Bed (Resolution No. R5-2017-0032; approved by State Water Board 2017-0048). Establishment of an SMA would require a stepwise process as described in the following activities:

■ The Contractor will use the results of the ambient groundwater quality analysis completed under Task 4.2.2 and any other relevant data to identify areas within any SMR that may be a potential candidate for de-designation of MUN and AGR to facilitate establishment of an SMA. The Contractor will present recommended locations for MUN/AGR de-designation to the TAC and CV-SALTS Executive Committee, including Central Valley Water Board staff, for review and comment.

■ For each location where the Executive Committee agrees with the recommendation, the Contractor will work collaboratively with potentially affected entities within the area where MUN/AGR is being considered for de-designation to determine support for the process and establishment of an SMA in the area following completion of a Basin Plan amendment.

■ If local stakeholder support exists to de-designate MUN/AGR and establish an SMA, the Contractor will (a) develop technical documentation to support preparation of a Basin Plan amendment to de-designate MUN and AGR from the proposed area; and (b) develop the necessary regulatory, institutional and technical documentation to support establishment of an SMA. This effort will require close coordination with the CV-SALTS Executive Committee and Central Valley Water Board staff to ensure that the appropriate technical documentation is developed to support the required regulatory approval process to establish the SMA, e.g., demonstrate how the salt delivered to the disposal site will be contained and will not adversely affect other waterbodies (surface water or groundwater) or other natural resources.14

Deliverables: The Contractor will complete the draft and final technical memoranda or Reports that provide the following:

■ Recommended candidate locations for de-designation of MUN/AGR from a groundwater basin/subbasin to facilitate establishment of an SMA.

■ Outcome of collaboration with potentially affected entities where de-designation of MUN/AGR is proposed for the purposes of establishing an SMA.

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14 As noted in Task 4.1.2.1, it is unknown at this time what kind of regulatory process would be needed to establish an SMA consistent with the intent of the Salt Control Program.
- Technical documentation to support de-designation of MUN/AGR from approved locations.\textsuperscript{15}
- Regulatory, institutional and technical documentation to support establishment of an SMA where de-designation is expected to occur

**Task 4.2 – Characterize Salt Management Regions\textsuperscript{16}**

In Task 4.1.1, the SMRs are delineated and key characteristics are developed. Task 4.2 further characterizes the SMRs in terms of three attributes: (a) the current ambient water quality and trends for groundwater and surface water; (b) sources of salt loading; and (c) the benefit of current and proposed actions. This information will be incorporated into the SMT developed under Section 3.3.

**Task 4.2.1 - Characterize Current Ambient Salinity Conditions**

The SMR Contractor will characterize ambient salinity conditions in surface water bodies and in groundwater. The following sections summarize the tasks to be completed for each water body type.

**Task 4.2.1.1 - Current Ambient Salinity Conditions in Surface Water Bodies**

The Contractor will catalog potential surface water sampling stations with publicly available data in the SMR for use in characterizing ambient salinity conditions in lotic and lentic surface waters (sources include, but may not be limited to, USGS, Central Valley Water Board, CEDEN, etc.). The identification of potential stations will be consistent with work that may be ongoing as part of the development and implementation of the SAMP established to comply with the Salt & Nitrate Control Programs. In addition, and where appropriate to better characterize ambient salinity conditions within an SMR, the Contractor will work with agencies that may have data not publicly available (e.g., water districts) to identify sampling stations for potential use in this task. For all stations catalogued, the Contractor will evaluate the site to determine the availability of flow and relevant water quality EC and/or TDS data. For reservoirs, the evaluation will also consider the availability of surface elevation and depth-related data.

The Contractor will recommend stations for use in the characterization of surface water ambient salinity conditions within the SMR. The selected stations and the basis for their selection will be documented in a technical memorandum. The TAC and Executive Committee will review and comment on the recommendations. The final selection of stations

\textsuperscript{15} The Basin Plan amendment process to de-designate MUN/AGR would occur outside of this Workplan; other documentation required to support the Basin Plan amendment process, e.g., CEQA, staff report development, is not included in this task.

\textsuperscript{16} It is recommended that for Tasks 4.2 through 4.6 that a single Contractor be procured to complete all the work within any one SMR.
to characterize surface waters must be approved before the water quality data are characterized.

The Contractor will compile the surface water data from the stations approved by the TAC and Executive Committee. The compiled data for each SMR will be analyzed using standard accepted methods to characterize ambient salinity conditions temporally and spatially within the SMR, e.g., time-series plots, trend analyses, and attainment of relevant thresholds for protection of MUN and AGR beneficial uses. The Contractor will prepare draft and final technical memoranda with the findings for the SMR.

**Deliverables:** Draft and final technical memoranda that: (a) identifies potential surface water stations for analysis, data availability from these stations and recommendations for stations to be used to characterize ambient surface water conditions in the SMR; and (b) characterizes the temporal and spatial ambient surface water conditions for salinity in the SMR. Contractor will also provide data in a format applicable for use in the SMT (see Task 3.3).

**Task 4.2.1.2 - Current Ambient Salinity Conditions in Groundwater**

The SMR Contractor will assess the current ambient TDS concentrations in groundwater utilizing a scientifically-based methodology approved by the Executive Committee. Upper and Lower Zones will be characterized (consistent with approach established in CV-SALTS). The ambient water quality in groundwater will be determined to be the volume-weighted TDS concentration in the Upper, Lower, and Production zone of each groundwater basin.

The Contractor will estimate ambient water quality for TDS in groundwater using a methodology approved by the TAC and CV-SALTS Executive Committee. The selected methodology must be consistent with the methodology used for the periodic 5-year ambient water quality assessment used for the SAMP established to comply with the Salt & Nitrate Control Programs. If no such methodology has yet been established when the analysis for this task is to be completed, the Contractor will work with the TAC and Executive Committee to establish a methodology that will meets the needs of the task and is consistent with the needs of the periodic SAMP assessment. In developing such a methodology, the Contractor will consider using the already approved assessment methodology employed in the Santa Ana Region of California (as required pursuant to the Region 8 Basin Plan, see Appendix B). The Contractor may also propose an alternative methodology or modifications to the existing Santa Ana Region methodology (e.g., increasing the reporting period from 3 years to 5, shortening the temporal averaging period from 20 years to 10 or 5; using the straight volume-weighted average TDS rather than the average of a statistic generated for each well). If recommending a methodology, the Contractor will prepare a technical memorandum that documents the procedures and technical basis for the methodology for TAC review and Executive Committee approval.

**Deliverables:** Draft and final technical memoranda that include: (a) groundwater elevation and TDS contour maps; (b) summary of the results of the AWQ groundwater quality analysis
for groundwater underlying the SMR (results will include spatial results as well as temporal trends; (c) time series plots of TDS at key wells in each SMR; (d) grid extract file (ArcGIS) that contains all the pertinent information, including groundwater elevation, bottom of the production zone, specific yield, and TDS concentration; and (e) data provided in a format applicable for use in the SMT (see Task 3.3).

**Task 4.2.2. Sources of Salt Loading**

A water budget is a representation of the hydrologic cycle and accounts for water stored in surface water bodies, watersheds, and groundwater. A water budget tracks the water stored, as well as water exchanged between the components of the hydrologic cycle. Inputs into the storage components are called recharge terms, while outputs from the storage components are called discharge terms. The net balance of recharge and discharge terms results in an increase or decrease in the water storage term. In addition to the fluxes of water, there are changes in the mass of salt in the storage components based on volume-weighted salt loads in each of the recharge and discharge terms.

In this task, the Contractor will develop a conceptual diagram based on the HCM (see Task 3.3.2) that identifies sources and sinks of salt and water in the SMR. Sources may be natural, result from water transfers, permitted dischargers, stormwater, etc. For each identified source the Contractor will estimate the salt load through a combination of gaged/monitoring data, measured recharge and discharge components, permitted discharges, literature data for some discharge and discharge terms, and the calibration data from the SMT. The Contractor will work with the appropriate entities (dischargers, water districts, etc.), as needed, to develop an understanding of available data. All of these recharge and discharge terms will be components of the analytical salt balance equation as described below.

**Deliverables.** Draft and final technical memoranda that includes: (a) a conceptual diagram that identifies the sources and sinks of salt and water in each SMR; (b) an estimate of the salt load from each key source evaluated; (c) documentation to support findings.

**Task 4.2.3 – Quantify Benefits from Ongoing and Planned Salt Management Activities**

For each SMR the Contractor will estimate the reduction in salt load expected to occur based on ongoing and planned salt management activities. The contractor will work collaboratively with the appropriate entities within each SMR (e.g., dischargers, water districts, food processors, industry, etc.) to identify current and planned salt management projects. The Contractor will evaluate estimates provided in existing project planning documents (if available) or develop estimates for the purposes of the P&O Study in collaboration with the owner of the project. These estimates of decreased salt load will be based on the type of project, size of the project, and site-specific environmental conditions.

**Deliverables:** Draft and final technical memoranda for each SMR that quantifies the reduction in salt loading for use in the SMT. Specifically, the technical memoranda will identify current and planned projects, their relevance to the purposes of achieving

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GEI Consultants, Inc.  
LeClaire & Associates; LWA  
Draft June 18, 2019  
P&O Study Workplan
sustainability, implementation schedule, estimate of expected load reduction from each project and a projection of when the reduced salt loading will begin to occur.

**Task 4.3 – Sustainability Analysis**
The Contractor will identify and quantify salt reductions from the implementation non-physical products in each SMR. The Contractor will also estimate the remaining load reductions that would be required to achieve salt sustainability, i.e., salt balance within each SMR.

**Task 4.3.1 – Quantify Expected Benefits from Implementation of Non-physical Projects in Each SMR**
In Task 4.2.3, the Contractor estimated the expected reduction in salt load based on ongoing and planned salt management activities in the SMR. In this task, the Contractor will quantify the reduction in salt load based on all non-physical projects, including but not necessarily limited to, source control BMPs and land management projects.

**Task 4.3.2 - Estimate Remaining Load Reduction Required to Achieve Sustainability**
The SMR Contractor will determine the existing salinity balance for each groundwater basin. This will be done through a combination of mapping groundwater and surface water data, performing trend analyses, and through the use of the SMT. Current and projected salinity concentrations will be compared with numeric and/or narrative water quality objectives (existing or expected, e.g., if planned for development as part of this Workplan or in the future). Prior to developing this estimate, the Contractor will coordinate with the CV-SALTS Executive Committee to ensure the appropriate water quality targets are used for this analysis within the SMR.

**Deliverables:** Draft and final technical memoranda summarizing the additional load reduction required to achieve sustainability in each SMR. The technical memoranda will document the basis for the salt management targets used for each SMR.

**Task 4.4 – Develop Salt Management Alternatives Appropriate for Each Salt Management Region**
The purpose of this task is to work through a technical evaluation process that considers regional, sub-regional and local approaches to reduce the impacts from salt and achieve a salt balance within each defined SMR. The technical evaluation process will: (a) develop initial alternatives to achieve salt sustainability based on the findings from the analysis completed in Task 4.3; and (b) conduct an analysis to narrow down potential alternatives to the top five for subsequent analysis in Task 4.5 and following in order to select a preferred salt management strategy for implementation in Phases II and III. While the analysis is developed on an SMR-specific basis, the preferred alternative, which is expected to include a combination of physical and non-physical projects, may include projects for collaborative implementation with other SMRs.
Task 4.4.1 – Identify Potential Physical Projects to Address the Sustainability Gap within Salt Management Regions

In the introduction to this Workplan, Figure 1-2 depicts the adaptive approach to the Salt Control Program and identifies tasks to be undertaken in Phase 1 of the three-phase program. The P&O study will identify and prioritize preferred physical projects for long-term salt management (e.g., regulated brine line(s), salt sinks, regional / subregional desalters, recharge areas, deep well injection, etc.) Further, the P&O study will develop the conceptual design (10 percent engineering design) of preferred physical projects (except where a conceptual design for an incorporated physical project has already been developed or will be developed by another entity, e.g., GSA) and assess the environmental permitting requirements and costs associate with each of the projects.

There are four elements to be evaluated in the development of SMR-based preferred physical projects:

■ Locations of source water facilities (e.g., POTW effluent, pumped groundwater, agricultural drain water, industrial effluent etc.) and treatment facilities, in relation to locations of SMAs

■ Treatment options

■ Transport options for source water, brine / salt, and product water (brine disposal options include both local SMAs and a regulated regional brine line with ocean disposal)

■ Salt management / storage / disposal options

Each of these elements will be discussed in the following task descriptions:

Task 4.4.1.1 - Evaluate Options for Facilities Locations

The Contractor will optimize the locations of facilities. Brackish / high salinity waters will be delivered from the source or raw water collection facilities to the treatment facility. The treatment facility will produce a product water stream and a waste stream of brine concentrate. The product water will be conveyed to facilities for beneficial uses, e.g. MUN and / or AGR. The brine concentrate (or salt solids) will be transported to either an SMA or through a regulated regional brine line for ocean disposal. See Task 4.4.3 for a conceptual description of this option. In the near-term, the brine transport and disposal/management will likely occur at SMAs, as a regulated brine line would take many years to design, fund, permit, and construct. This multi-objective task must consider the following:

■ The location(s) of source water facilities. These facilities provide the raw water to be treated at the desalter facilities. The locations of the source / raw / feed water facilities are based on optimizing salt removal and reducing the sustainability gap.

■ The location(s) of desalters.

■ The location(s) of the SMAs, or other disposal areas, as identified in Task 4.1.2.
The Contractor will perform a preliminary evaluation and rank the options for facility locations based on consideration of the following factors (final locations of facilities will be refined based on the alternative analyses using the SMT as described in Task 4.5).

- Volume of the source water to be treated (POTW effluent, O&G brine; industrial wastewater effluent, agricultural drain water, and/or groundwater). This will determine the footprint and size of the treatment facilities.
- Capacity of the desalters and expected brine generation, which will help to define the pipeline diameter.
- Topography between facilities.
- Preliminary evaluation of permitting requirements at a fatal flaw analysis-level. Additional refinement of key permitting issues would be conducted in Task 4.7 (however, note that implementation of work to permit a project would not occur until Phase II of the Salt Control Program).
- Minimize nuisance to residential areas, including construction noise and air quality, and overspray from enhanced evaporation ponds.
- Costs for an array of potential pipeline alignments.
- Easements and land acquisition.

**Deliverables:** Draft and final technical memoranda providing recommendations on facility locations within each SMR.

**Task 4.4.1.2 - Evaluate Treatment Options**

The Contractor will review the findings from the most recently completed study of Mature and Emerging Technologies for Salinity Treatment (Task 3.4.2). The Contractor will provide a ranked list of potential sites where the water treatment facilities would be located, based on a set of criteria. The Contractor will also review/analyze the chemistry of potential influent water into the treatment facility: groundwater, agricultural drain water, POTW effluent, and industrial wastewater effluent in the area of the treatment facility in order to determine the appropriate treatment technologies based on the water chemistry of the source water (Task 3.4.3). This analysis will also assist in determining if pre-treatment is necessary. For example, silica can foul RO membranes by polymerizing into long chains and the presence of polyvalent cations (e.g., calcium and magnesium) exacerbates the problem. This analysis will be preliminary only; any necessary sampling and analysis will occur as part of facility design in Phase II.

The Contractor will recommend a short list of viable treatment technologies that can close the sustainability gap described in Section 4.3. The final selection of treatment technologies appropriate for each SMR will be made in Tasks 4.4.2 and 4.4.3.
Deliverables: Draft and final technical memoranda providing recommendations on treatment technologies. Recommended treatment technologies may vary within each SMR and between SMRs.

Task 4.4.1.3 - Evaluate Transport Options

The Contractor will optimize the proposed locations of various facilities, as discussed in Section 4.4.1.1. In this task, the Contractor will consider the transportation or conveyance of source water to the treatment facility, the conveyance of product water to facilities for beneficial use, and the conveyance of brine concentrate or solid salts to disposal location(s). A long-term option for brine/salt transport and disposal is a regulated regional brine line for ocean disposal (CV-SALTS 2016) (see Task 4.4.3 below for development of this option).

It is assumed herein that conveyance of source water to the treatment facilities and conveyance of product water to beneficial use facilities will be via pipelines. This subtask will focus on conveyance options for the brine concentrate or solid salts.

Options for brine concentrate and or solid salt transportation to SMAs include (CV-SALTS 2016):

- Timed discharge of higher salinity water to surface water (e.g., San Joaquin and Sacramento Rivers)
- Trucking dry salt or brine concentrate evaluate
- Transporting dry salt or brine concentrate via rail
- Conveying brine through a regional, regulated brine line

The Contractor will perform the following analyses in evaluating options to transport salt to SMAs or other disposal locations.

- **Timed Discharge** - For timed discharge of higher salinity water to the San Joaquin and Sacramento Rivers, the Contractor will describe institutional and regulatory requirements and develop an estimate of discharge capacity on a weekly basis. The Contractor will evaluate existing monitoring programs to determine if adequate to assess whether timed discharges could impact beneficial uses in surface water downstream from the discharge location.

- **Truck and Rail** - For truck and rail transport of brine, the Contractor will determine the required truckloads or rail cars per day, estimate fuel costs and greenhouse gas (GHG) equivalencies, and identify Department of Transportation (DOT) and Air Quality Management District (AQMD) requirements.

- **Brine Lines** - The Contractor will evaluate the feasibility of constructing regulated brine lines from the desalter facilities to the SMAs or other disposal locations, identify easements, pipe material, pipe radius, pump stations, and determine whether local regulated brine lines could ultimately be used as a portion of the CVBL, including the
mainstem and laterals. Based on experience with other brine lines operation and maintenance of a brine line can be very challenging. Significant planning must be taken to anticipate the potential for chemical reactions, solids settling, inflow and infiltration, precipitation and scaling and pretreatment of brine at the desalters.

**Deliverables:** Draft and final technical memoranda assessing applicable transportation options

**Task 4.4.1.4 - Evaluate Salt Management / Storage / Disposal Options**

Brine or dry salt will ultimately be transported to an SMA(s) or other disposal option for long-term management, storage, and / or disposal. A regulated, regional brine line (CVBL) may be an option in the future (see development of this option in Task 4.4.3). A number of storage and disposal options were considered in the Final Report for the Phase 3 SSALTS (CV-SALTS 2016), including:

- **Commercial Landfills and Surface Impoundments** - Surface impoundments can accept brine, while landfills are an option for the acceptance of solid waste. Commercial solid waste landfills would require that the brine stream be de-watered to generate a near-zero liquid discharge (ZLD) or full ZLD prior to transporting the waste to a commercial landfill. ZLD is typically achieved using thermal technologies such as evaporators and crystallizers. ZLD minimizes the waste volume (and cost) and recovers more product water. ZLD will also reduce truckloads transporting salt to landfills reducing greenhouse gases and tipping fees.

- **Evaporation Ponds / Basins and Enhanced Evaporation** - Salt accumulation areas include evaporation ponds and enhanced evaporation ponds. Enhanced evaporation ponds include sprayers, misters, and agitators. Managed salt accumulation areas effectively manage all salts, nutrients and other constituents. One of the potential impacts of these types of facilities is the increased risk to waterfowl who are attracted to the evaporation ponds. Current WDRs include a number of programs to minimize avian disease linked to salinity and trace constituents, including the removal of attractive habitats, surveillance and control programs, and active harassment.

- **Deep Well Injection** – In this option, brine from the RO facilities (or other treatment / concentration processes) would be injected into deeper aquifers isolated from the primary drinking water aquifers for disposal or potentially for storage and future recovery. To the extent that there is storage capacity in an underlying deep aquifer that is of poor quality and is geologically isolated from any overlying aquifer that has existing or potential beneficial use for municipal, industrial or agricultural purposes, deep well injection will be evaluated as a storage / disposal option. The USGS has developed a Hydrologic Model of the Central Valley Region[^17] that assumes that the deepest layer of the “usable” groundwater aquifer - where water is relatively fresh - is approximately 2,700 feet below

the surface at the center of the valley. Water that may be in formations deeper than this is considered to be saline.

While deep well injection is a widely proven technology, the key concerns will be the chemical compatibility of the injected water and the formation to avoid plugging or fouling, and the long-term storage capacity of the formation into which the brine would be injected. Sources of power in remote areas is another potential issue that will need to be evaluated.

Injection wells can have useful lives of 30 to 40 years or longer if properly maintained. That said, there needs to be an on-going and regular program of maintenance and periodic rehabilitation, and careful thought must be given to the materials of construction, design issues, and brine quality to minimize fouling or mechanical plugging. In addition, permits will be required by the USEPA who, through the Underground Injection Control (UIC) program, “…regulates the construction, operation, permitting, and closure of injection wells used to place fluids underground for storage or disposal.”

The Contractor will perform the following analyses in evaluating options for the management, storage and disposal of salt at SMAs:

- Confirm the volume of brine concentrate requiring the management, storage, and disposal at SMAs. This volume would be based on the proposed influent treatment volume and the treatment technology.
- Determine the requisite capacity for salt management areas. Assurance of storage capacity for the next 100 years.
  - For surface impoundments, estimate the area and depth of the impoundment.
  - For solid waste disposal at a commercial landfill, determine the annual tipping fee based on the number of truckloads.
  - For evaporation ponds, estimate the area and depth of the evaporation pond.
  - For deep well injection, estimate the number of required injection wells.
- For each of the four salt management options, estimate capital and O&M costs.

Deliverables: Draft and final technical memoranda assessing applicable management / storage / disposal options

**Task 4.4.2 - Evaluate Groundwater Recharge Options**

In Task 3.4.1, the Contractor will evaluate the locations of existing and proposed groundwater recharge projects. As noted under that task, it is anticipated that groundwater recharge projects will be identified and evaluated by the GSAs under SGMA and that the

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18 [https://www.epa.gov/uic](https://www.epa.gov/uic)
Contractor will coordinate closely with the GSAs in evaluating these groundwater recharge projects for the purposes of the Salt Control Program. Using the findings from Task 3.4.1, the Contractor will determine how to best incorporate groundwater recharge projects into the SMR to support efforts to achieve sustainability. Recharge project locations planned for inclusion in the development of alternatives for the SMR will be identified in this task; their potential use will be optimized using the SMT (Task 3.3) as part of the alternatives analysis.

**Deliverables:** Draft and final technical memoranda describing recommended groundwater recharge projects proposed for inclusion in the development of salt management alternatives for the SMR.

**Task 4.4.3. Develop Concept for a Central Valley Brine Line**

Another option for salt disposal is an out-of-valley solution, i.e., transport the salt out of the Central Valley Floor via a Central Valley Brine Line (CVBL) to a discharge location to the Pacific Ocean or San Francisco Bay (CV-SALTS 2016). Brine transport could be accomplished through: (a) an existing permitted WWTP with capacity to accept the brine and combine it with treated wastewater in the outfall pipeline, with or without additional treatment at the plant; or (b) discharge through a new regulated outfall at some alternative location, with treatment of the brine to meet receiving water limitations and to comply with a new discharge permit. Any proposed CVBL would convey brine from desalting facilities in the Central Valley Region north or west to a WWTP for ocean disposal.

Two conceptual brine line alternatives were discussed in CV-SALTS (2016): (a) Alternative 1 followed a gas pipeline alignment (generally paralleling the 5 Freeway) along the western side of the Central Valley Region, turning west near Tracy and then north near Fremont; and (b) Alternative 2 envisioned pipelined crossing the coastal mountains (near Panoche Junction) to an ocean discharge location.

As part of the P&O Study, the Contractor will develop a 10 percent concept-level preliminary design report. The findings from this report will be considered during development of salt management alternatives for each SMR. The preliminary design report will address the following:

- Fatal flaw analysis of three pipeline alignment: (a) two previous conceptual options described above; and (b) an east to west pipeline alignment that begins near Naval Air Station LeMoore and transports brine to a discharge location near Morro Bay.
- Estimate the pipeline length for each of the three alternatives
- Make a preliminary recommendation on pipeline materials based on the corrosivity of the brine and other factors.
- Estimate the pipeline diameter for reaches of the CVBL, based on expected brine concentrations plus an uncertainty factor.
- Provide a concept design for pump stations.
Consider the need to ensure that agricultural chemicals, nutrients, metals, and naturally-occurring trace elements, such as selenium and boron in brine streams do not interfere with its ability to meet permit requirements for discharge to San Francisco Bay or the ocean (this effort will consider the findings from Workplan Task 3.4.3).

Deliverables: Draft and final Preliminary Design Report that evaluates the three disposal options (San Francisco Bay and ocean) and addresses the elements described above.

**Task 4.4.4 – Consider Collaborative SMR Strategies or Projects**

As discussed previously, the Contractor will work collaboratively with the GSAs to ensure that GSP and Salt Control Plan goals of water supply and salt sustainability, respectively, are attained. In this task, the Contractor will develop potential collaborative SMR strategies and projects to optimize the efficiencies in reducing the sustainability gap with proposed physical projects. These collaborative strategies can be intra-SMR or extra-SMR, that is, within an existing SMR or across two or more SMRs. The Contractor will work with stakeholders to identify where projects or opportunities may exist to jointly share in the development, construction, and operation of facilities for source water, treatment, or salt management / storage / disposal. This evaluation will include consideration of joint participation in sub-regional or regional projects, e.g., the CVBL for the disposal of brine to San Francisco Bay or the ocean.

Deliverables: Draft and final technical memoranda describing potential strategies and projects for collaboration among SMRs. The findings from these memoranda will be considered during development of salt management alternatives for each SMR.

**Task 4.4.5 – Develop SMR Salt Management Alternatives**

Based on the findings from Tasks 4.4.1 through 4.4.4, the Contractor will develop salt management alternatives for subsequent analysis in later tasks (refinement and optimization) to identify a preferred alternative. Development of up to ten initial alternatives and identification of the top five alternatives will be completed through the following tasks:

*Task 4.4.5.1 – Develop Initial Salt Management Alternatives for Ranking*

The Contractor will develop up to ten initial salt management alternatives for each SMR. Each of these alternatives will consist of an array of options for treatment, transport (of both brine and product water, including the timed discharge of higher salinity water to the San Joaquin and Sacramento Rivers), salt storage and management, groundwater recharge and groundwater extraction projects. To develop these alternatives, the Contractor will consider all relevant findings from other Workplan tasks, including but not limited to, findings from non-physical projects under Task 3.

Deliverables: A draft and final Alternatives Report will be prepared for each of the SMRs. This report will identify each of the alternatives to achieve salt sustainability. Each alternative will include sufficient information to describe the non-physical and physical
projects included in the alternative and the proposed approach and schedule to implement the alternative. Sufficient documentation will be included to support inclusion of each recommended project and the basis for concluding that the alternative, when implemented, can achieve salt sustainability in the SMR. Where a proposed alternative includes a project(s) that require collaboration with one or more SMRs, the alternative will describe how this collaboration would be implemented. Each alternative will include a preliminary cost estimate for implementation.

Task 4.4.5.2 – Develop Alternative Evaluation Criteria

The Contractor will develop a list of potential criteria to provide an objective basis for evaluating the alternatives developed in Task 4.4.5.1. The recommended criteria, basis for scoring and proposed use of any weighting factors will be reviewed and approved by the TAC and the CV-SALTS Executive Committee. The Contractor will develop recommended criteria based on the following criteria categories:

- **Technical Feasibility or Implementability** - This criterion includes the ability to construct and operate the components of each alternative along with the long-term reliability of the technologies. Technical feasibility also incorporates the extent to which the alternative can be adapted to include other potential remedial actions (e.g. other constituents of concern, including nitrate).

- **Salt Capacity of the Salt Management or Disposal Method** - This criterion looks at the mass or concentration of salt that can be managed or disposed of by the method in question.

- **Regulatory Constraints** - This evaluation criterion provides a high-level review of known and likely significant regulatory challenges including compliance the following: Basin Plan water quality objectives, WWTP discharge limits, WWTP Resource Recovery permits, WDRs, UIC permits, NEPA/CEQA, water rights, etc.

- **Institutional Requirements** - Institutional requirements speak to successfully bringing the project on-line, not from a technology standpoint (which is addressed by the technical feasibility evaluation), but from a context of governance or management. For example, ability to use water transfers to improve salinity conditions in a given SMR. Agency, group of agencies, coalition, joint powers authority, company or consortium of companies responsible for the development and operation of the project.

- **Capital Costs and O&M Costs** - To the extent possible, capital costs and O&M costs will be normalized to the cost per mass of salt load reduced or TDS removed.

- **Potential Environmental Issues** - Aside from salinity, there are other constituents of potential concern that are evaluated in this section as well as other possible

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19 Development of these criteria needs to be coordinated among all SMRs so that the criteria and weighting factors are applied consistently.
environmental concerns. For example, selenium accumulation in standing water in evaporation basins or discharge ponds provides a potential exposure pathway and ecological risk to certain species. Trucking waste as a disposal option – when expanded in scope and scale (e.g., valley-wide) – may have air quality and carbon footprint issues. The act of groundwater pumping can have other environmental consequences, including impacts to surface water where there is connectivity with groundwater, and land subsidence. The construction of the CVBL, and its associated treatment facilities and extraction facilities will require numerous mitigation measures to address environmental issues.

- **Public Acceptance** - This factor takes into account public awareness and acceptance of the disposal method utilized by the alternatives.

- **Funding** - This factor evaluates the likelihood of obtaining funding support from various stakeholders, including federal, state, and local agencies, as well private companies and the agricultural community. Funding can be parsed into a series of tiers, e.g., projects already funded, projects with identified funding sources, and projects that have no funding basis and new sources of money would be required.

**Deliverables:** (a) Draft technical memorandum for TAC and CV-SALTS Executive Committee review that provides recommended evaluation criteria, potential weighting factors and the proposed alternatives scoring approach; and (b) final technical memorandum that provides the basis for the final list of evaluation criteria.

**Task 4.4.5.3 – Identify Top Five Alternatives**

Using the evaluation and ranking procedure developed in Task 4.4.5.2, the Contractor will rank the salt management alternatives developed in Task 4.4.5.1. Based on the initial ranking of the alternatives from 1 to 10, the Contractor will select the top 5 of 10 alternatives for additional analysis in Task 4.6 and following. In ranking the alternatives and explaining the outcome to the stakeholders, the Contractor will consider using decision management software like Criterium Decision Plus. The Contractor will, in conjunction with the TPM, lead discussions with stakeholders concerning the ranking of alternatives including the criteria score and the criteria weight. Based on the outcome of stakeholder input the top five alternatives will be identified.

**Deliverables:** Draft and final technical memoranda that: (a) identifies the top five salt management alternatives for additional analysis to select a preferred salt management strategy for each SMR; (b) provides a detailed narrative that explains the ranking analyses; and (c) provides a sensitivity analyses with a series of what-if scenarios resulting in alternative strategies.
Task 4.5 – Optimization Analysis and Selection of the Preferred Salt Management Alternative for Each Salt Management Region

Once the top five alternatives have been selected (Task 4.4.5.3), the Contractor will propose an optimization analysis, which will have two components: (a) removing as much mass as possible from the SMR and (b) achieving salt sustainability. The locations of SMR facilities and options for treatment, conveyance/transport, and salt management will also be optimized based on conceptual-level cost estimates and taking into account the criteria developed in Task 4.4.5.2.

After the optimization analysis, the Contractor, working in conjunction with the TAC and Executive Committee, will select the top three project alternatives out of five. In addition to the top three project alternatives, the Contractor for each SMR will also evaluate the following scenarios:

- “No-project” scenario, which models each SMR for salt control activities in place in 2020.
- “Project baseline” scenario, which models each SMR for proposed salt control activities 50 years into the future, beginning in 2030. Salt control projects would come on-line as proposed in the P&O Study. The project baseline would include a scenario(s) for climate change (as appropriate at the time of the analysis).

Each of these alternatives will be analyzed using the SMT (see Task 3.3).

The TRP (established under Task 3.3.) will be reconvened to review the results of the SMT model runs for the scenarios discussed above. The TRP will provide comments and suggestions on the final SMT model runs. The Contractor will address these comments, as appropriate. Based on the outcome of the modeling process, the Contractor will recommend a preferred salt management alternative for TAC and Executive Committee review. Based on comments received a revised preferred salt management alternative will be prepared for stakeholder review in the SMRs. Based on the outcomes of these review activities the Contractor will prepare a Preferred Salt Management Alternative Report for each SMR.

Deliverables: The Contractor will complete the following deliverables:

- Draft SMT model runs and supporting documentation for TRP review (Note: The TRP’s review of the model runs will not be a separate deliverable, but the comment and response table will be part of the draft Preferred Salt Management Alternative Report as an appendix;

- Draft Preferred Salt Management Alternative Report for TAC and Executive Committee review;

- Revised draft Preferred Salt management Alternative Report for presentation at a SMR stakeholder workshop (see Task 1.4.3); and
Final Preferred Salt Management Alternative Report for each SMR that includes supporting documentation and the process completed to select the alternative.

**Task 4.6 – Develop Phase II SMR Implementation Plans**
In Task 4.5 the preferred salt management alternative for each SMR was selected, based on criteria and weights used in the alternatives analysis and the findings from the optimization analysis. Task 4.6 bridges the outcome of the alternatives analysis (selection of a preferred salt management alternative) to implementation of salt management activities in Phase II of the Salt Control Program.

**Task 4.6.1 – Develop Conceptual Designs for Selected Physical Projects (including Cross-Regional Projects)**
For each physical project identified for Phase II implementation in each SMR, the Contractor will prepare a conceptual design (equivalent to approximately a 10 percent engineering design) with a discussion of the implementation requirements for projects requiring significant interagency collaboration (including between SMRs). Each conceptual design will provide a general physical layout of the project, information regarding how the project is intended to function, which SMRs will participate in the project if more than one, a proposed schedule for further development of the project during Phase II and a preliminary cost estimate for the overall project.

**Task 4.6.2 – Conduct Preliminary Assessment of Environmental Permitting Requirements for Selected Physical Projects**
The Contractor will conduct a preliminary assessment of environmental permitting requirements based on the conceptual designs prepared for each project in Task 4.6.1. In addition, other factors that could present significant challenges to the siting, construction, and operations of components of the preferred alternatives will be evaluated in this subtask (e.g., Disadvantaged Communities (DACs), Disadvantaged Unincorporated Communities (DUCs), archeological protected areas, tribal lands, etc.).

**Task 4.6.3 – Prepare Phase II SMR Implementation Plans**
The Contractor will prepare a Phase II Implementation Plan for each SMR. This Plan will include the following elements: (a) existing and already planned salt management projects and expected salt load reduction after full implementation (findings from Task 4.2.3); (b) non-physical projects planned for implementation based on the outcomes of the P&O Study (outcome of Task 4.3.1); (c) physical projects identified through the alternatives development and evaluation process (Task 4.4); and (d) technical discussion regarding how the planned Implementation Plan will make progress towards achieving salt sustainability. Conceptual designs and an assessment of the requirements to permit and implement each physical project will be incorporated into this Plan (outcome of Tasks 4.6.1 and 4.6.2). The Contractor will also prepare a preliminary schedule and estimated costs for implementation of the Implementation Plan during Phase II. Draft Plans will be submitted to the TAC and
Executive Committee and local stakeholders for review and comment. Local stakeholder review will be completed through a local SMR stakeholder workshop (see Task 1.4.3).

**Deliverables (Task 4.6):** Draft and final Phase II SMR Implementation Plan for each SMR.
5.0 References


DWR. 2019. *FLOOD-MAR: Advancing Integration for Water Management Sustainability.* February 2019. [https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Flood-MAR/FloodMAR-factsheet_v5.pdf?la=en&hash=1910F78496C8D9276443104B3E3558A9E900B3EC](https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Flood-MAR/FloodMAR-factsheet_v5.pdf?la=en&hash=1910F78496C8D9276443104B3E3558A9E900B3EC)


State Water Board. 2018. *Regulations Related to Recycled Water.* October 1, 2018

Appendices

Placeholder

Appendix A – Salt Control Program Basin Plan Amendment (Excerpted from R5-2018-0034)
Appendix B – Example Methodology: Groundwater Ambient Water Quality Determination for Region 8
# Revised Draft Outline for State Water Board Workshop Presentation

(Version 2 – June 13, 2019)

<table>
<thead>
<tr>
<th>Topic</th>
<th>Presenters</th>
<th>Estimated Time</th>
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<tbody>
<tr>
<td>Overview of CVSALTS &amp; Basin Plan Development Process</td>
<td>Patrick Pulupa</td>
<td>5 minutes</td>
</tr>
<tr>
<td>Nitrate Control Program &amp; Related Policies</td>
<td>Patrick Pulupa &amp; Anne Littlejohn</td>
<td>60 minutes</td>
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<tr>
<td>- Priority Basins &amp; Sub-basins</td>
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<tr>
<td>- Permitting Approaches</td>
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<td></td>
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<tr>
<td>- Individual</td>
<td></td>
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<td>- Management Zone</td>
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<tr>
<td>- Schedule for Implementation</td>
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<td>- Required Deliverables</td>
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<td>- Early Action Plan</td>
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<td>- Implementation Plan for Long-term Sustainability</td>
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<td>- Exceptions Policy</td>
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<td>- Enforceability</td>
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<td>- Conditional Discharge Prohibition</td>
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<tr>
<td>- General Order Revisions</td>
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<td>- Offsets Policy</td>
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<td>Patrick Pulupa &amp; Anne Littlejohn</td>
<td>30 minutes</td>
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<td>- Permitting Approach for Phase 1</td>
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<td>- Conditional Discharge Prohibition</td>
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<td>Other Policies &amp; Actions</td>
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<td>- Drought &amp; Conservation Policy</td>
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<td>- Application of Secondary MCLs to Protect MUN</td>
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<tr>
<td>Stakeholder Panel Responses</td>
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<td>- Management Zone Pilot Study Panel</td>
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<td>(15 minutes each panel)</td>
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<td>- Environmental Justice Stakeholders</td>
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<td>- Drinking Water Stakeholders</td>
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<tr>
<td>- Salinity Coalition Stakeholders</td>
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APPROACHES FOR P&O IMPLEMENTATION

IMPLEMENTING THE CV-SALTS SALT AND NITRATE MANAGEMENT PLAN FOR THE P&O STUDY

SALINITY AND NITRATE PERMITTING FRAMEWORK TO IMPLEMENT P&O STUDY

• Salinity Permitting Strategy allows funding for the Prioritization and Optimization Study (P&O) via CVSC
• The BPA allows funding of the Surveillance and Monitoring Program (SAMP)
• P&O Scoping/Workplan being done in advance with CAA Grant
• Initial budget from SSALTS for P&O
• Developing approach/framework to apportion and collect a fees
CONCEPTUAL BUDGET FOR P&O

• All Permits/WDRs regulate Salinity
  • Some may choose Path A
• Central Valley NPDES permit – ~296
• Central Valley WDRs - ~1348
• Budget estimate
  • Average Year $1,500,000
  • Initial Year expected to be lower
• Actual Costs determined during Scoping and Work planning
• SAMP Costs are not included and would be on different basis

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<th>Year</th>
<th>Low</th>
<th>High</th>
<th>Collection &amp; Overhead</th>
<th>Total Est. Average</th>
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<td>$237,510</td>
<td>$3,362,510</td>
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<td>$2,000,000</td>
<td>$2,500,000</td>
<td>$162,500</td>
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Average Cost per Year: $1,500,001

PERMITTING AND FEE APPROACH TO IMPLEMENT P&O STUDY

• CVSC members worked to develop a methodology based on industries represented
• CVSC Members representing and Industry or permit type made minimum revenue commitments
• Fees by permittee size (Acres/MDG/Cases/Barrels/etc.) where appropriate/understood
• Resolution 1004 to implement the Program
  • Credit +20% on first year for payments before notice to comply
  • First year selection process for opting for Path B
  • Back Fees to enter after notice to comply and original selection
  • Late and Collection fees after first year
  • Credits/Overpayments credited to permit type/industry
### P&O Fee Summary by Industry/Permit Type

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<th>Type/Indust.</th>
<th>Communities</th>
<th>Irrigated Ag Coalitions</th>
<th>Dairy</th>
<th>Food Proc</th>
<th>Wine</th>
<th>Oil/Gas</th>
<th>Others **</th>
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<tr>
<td>Total Cost</td>
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<td>$496,182</td>
<td>$57,750</td>
<td>$128,100</td>
<td>$77,550</td>
<td>$160,000</td>
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<td>33.1%</td>
<td>3.9%</td>
<td>8.5%</td>
<td>5.2%</td>
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<td>Permits/WDRs</td>
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<td>14</td>
<td>1100</td>
<td>183</td>
<td>118</td>
<td>1000</td>
<td>350+</td>
<td>3500+</td>
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<tr>
<td>Each*</td>
<td>$250-$12,500$3,200-$100,000 by acreage $700 $250-$3,000 $160/fac $250 min</td>
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</table>

* Most permit types contribute on sliding scale for size, salinity and other factors
** All Other Permit Types are a minimum of $250 by permit
*** Total includes P&O Study plus collection and overhead not SAMP or CVSC
PERMITTING AND FEE APPROACH TO IMPLEMENT P&O STUDY

• Outreach
  • PEOC developed a two page handout describing the P&O Study
  • Separate Web page

• Workplan Development in Development

• Implementation Planning and development
  • Coordination with State and Regional Board
  • Processes

• SAMP Fee structure will begin in August
State Water Resource Control Board Hosts Public Workshop

Regarding Regulatory Changes for Managing Salts and Nitrates on July 2, 2019

[DATE ] Sacramento, CA...The State Water Resources Control Board (State Water Board) is holding a Public Workshop at 9:30 a.m. on Tuesday, July 2, 2019, to receive information and solicit public input regarding the Central Valley-wide Salt and Nitrate Control Program (Salt and Nitrate Control Program). The workshop will take place at the California Environmental Protection Agency’s Coastal Hearing Room, 1001 I Street, Second Floor, Sacramento, CA 95814. At the workshop the State Water Board will receive information from the Regional Water Board staff and oral comments from interested persons related to the Salt and Nitrate Control Program. There will be no action taken at the workshop.

The State Water Board is considering approving the Central Valley Regional Water Quality Control Board (Regional Water Board) Amendments to the Sacramento and San Joaquin Basin Plan and the Tulare Lake Basin Plan to incorporate the Salt and Nitrate Control Program. The Regional Water Board approved the Salt and Nitrate Control Program in May 2018.

The Salt and Nitrate Control Program provides a new framework for the Regional Water Board to regulate salt and nitrate, while also ensuring a safe drinking water supply. The amendments represent the most significant changes in decades to the regulation of salts and nitrates in the surface and ground waters of Central Valley.

Daniel Cozad, Executive Director, Central Valley Salinity Coalition (CVSC), noted, “With these amendments, the Regional Water Board will be able to ensure safe drinking water in affected areas and offer greater flexibility for discharger compliance. The approval is a monumental milestone for water quality in the Central Valley, bringing much needed progress toward improved surface and ground water quality.

Procedure for Adoption of Salt and Nitrate Control Program

The State Water Board may schedule a subsequent State Water Board Meeting to consider approval of the Salt and Nitrate Control Program. State Water Board approval is required to implement the Salt and Nitrate Program. The Office of Administrative Law and the U.S. Environmental Protection Agency (EPA) must also approve the Salt and Nitrate Control Program.

Why is a New Salt and Nitrate Control Program Needed?

The buildup of salts and nitrate pose a threat to drinking water, agriculture, and the environment. Levels have increased in the waters of the Central Valley due to the long-term effects of population growth, application of farm fertilizers and soil amendments, food processing, and other industrial
activities and municipal water use. The new Salt and Nitrate Control Program is designed to address both the past accumulation of salt and nitrate in surface and groundwater and the ongoing issue of nitrate and salt accumulation. The primary focus for the first ten years of the program is to provide safe drinking water for users currently affected and reduce the level of nitrates affecting groundwater supplies used for drinking water.

The goals of the Salt and Nitrate Control Program are to sustain the Valley’s agricultural lifestyle; support regional economic growth, retain a world-class agricultural economy, maintain a reliable, high-quality water supply, and protect and enhance the environment. To support the goals, the Salt and Nitrate Control Program includes recommendations for new policies and regulatory strategies including:

1. Short- and long-term solutions for salt and nitrate discharges from municipal, agricultural, and industrial activities while first focusing on providing safe drinking water supplies in identified high-priority areas of the Central Valley.
2. A new regulatory framework that moves away from the current “one-size fits all” regulations and provides more locally focused nitrate regulations to better address the Central Valley's natural diversities (e.g., climatic, hydrologic, geologic) while protecting water quality and maintaining a strong economy.
3. Long-term restoration of groundwater quality where reasonable, feasible, and practicable.

In the Central Valley, salt and nitrate discharges by agricultural, municipal, and industrial activities are subject to the regulations of the Regional Board and the U.S. EPA. New and improved management practices have already been implemented to reduce salt and nitrate discharges into surface and ground waters, but compliance with current regulations is difficult and, in some areas of the Central Valley, even impossible.

Key Regulatory Changes Included in New Salt and Nitrate Control Program

- For the first time, the Regional Board will be able to require municipal, agricultural, and industrial dischargers to provide safe drinking water supplies in identified high priority areas of the Central Valley that include the Kaweah, Turlock, Chowchilla, Tule, Modesto, and King basins or subbasins.
- For the first time, dischargers will have a choice in how they comply for nitrate discharges: Path A – Individual Permitting Approach and Path B – Management Zone Approach.
- For the first time, dischargers will have the flexibility to work together and form Management Zones where dischargers can collaborate to develop more cost-effective discharge controls and groundwater management approaches for nitrates while first providing safe drinking water. Members of a management zone work together to assure zone residents have safe drinking water. In exchange, the zone participants are allowed more time and flexibility to achieve nitrate compliance. The Regional Water Board provides guidance, oversight, and necessary approvals for management zone creation, planning, and implementation.

Additional Background

Over the last decade, the Central Valley Salinity Coalition (CVSC) has worked side-by-side with the Regional Water Board to prepare the January 2017 Salt and Nitrate Management Plan (SNMP) – the basis for the new Regional Water Board Salt and Nitrate Control Program.

The Central Valley is the epicenter of California's economy—encompassing 40% of the state and providing water for people and businesses from San Francisco to San Diego, as well as food for California, the nation, and the world. Over the last 150 years, increased agricultural, industrial, and municipal activities, coupled with population growth, have resulted in dramatic increases in salts and nitrates in groundwater, soils, and surface waters. In some communities, the nitrate concentrations have caused unsafe drinking water. Salt accumulations have resulted in the loss of 250,000 productive acres, and 1.5 million acres have been declared salinity impaired. If not addressed, the economic impacts of salts and nitrates on the Valley are estimated to exceed $3-billion per year.¹

The Regional Water Board oversees the regulation of agricultural, municipal, and industrial waste discharges of nitrates and salts within the Central Valley. The Regional Water Board uses Basin Plans as the basis for regulating water quality.  

In 2006, a coalition of stakeholders, including federal, state and local agencies, permitted dischargers (e.g., growers, ranchers, municipalities, food processors), and environmental justice groups, started discussing how to maintain a strong economy while ensuring safe drinking water. This collaborative initiative is called the **Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS)**.  

In 2008, the Central Valley Salinity Coalition (CVSC) was formed to help fund the technical and scientific studies necessary to support the development of alternative regulatory approaches. The Central Valley Salinity Coalition (CVSC) is a non-profit coalition of public agencies, business, associations and other members working together to better manage salt and nitrates in the Central Valley of California. The CVSC formed to organize, facilitate, and fund efforts needed for the efficient management of salinity and nitrates in the Central Valley.  

**Current Members of CVSC include:**

San Joaquin Valley Drainage Authority, California Association of Sanitation Agencies, California League of Food Producers, The Wine Institute, Dairy Cares, City of Fresno, City of Davis, City of Manteca, City of Modesto, City of Tracy, City of Stockton, City of Vacaville, Central Valley Clean Water Agencies, Southern San Joaquin Valley Water Quality Coalition, Northern California Water Association, Tulare Lake Drainage and Water Districts, Stockton East Water District, California Cotton Growers and Ginners Association, California Rice Commission, San Joaquin Tributary Authority, Western Plant Health Association, East San Joaquin Water Quality Coalition, San Joaquin County & Delta Water Quality Coalition, Pacific Water Quality Association, Sacramento Regional County Sanitation District, California Resources Corporation, Westlands Water District, Valley Water Management Company, and California Independent Producers Association

Central Valley Salinity Management: De-Designated Areas

Salinity Regulations
New requirements for managing salinity in the Central Valley apply to all regulated dischargers in the Central Valley, including those in areas that have been de-designated for salinity compliance.

In May 2018, the Central Valley Regional Water Quality Control Board (Regional Board) adopted Basin Plan amendments to address the long-term accumulation of salts in the Central Valley (Valley). The goal is to protect and preserve the beneficial uses of water for people, the environment, and the economy. These new salinity requirements apply to all permitted dischargers in the Valley, including dischargers in areas where groundwater has been or will be de-designated for agricultural or municipal beneficial use.

With the anticipated approval of the Basin Plan amendments by the State Water Resources Control Board, a Prioritization and Optimization Study (P&O Study) will identify strategies and projects for reducing and removing salts that otherwise would hinder crop production, impair water quality, harm ecological functions, and reduce water supply. During this time, water dischargers would operate under one of two permitting pathways: more stringent site-specific salinity control requirements or participation in the Valley-wide P&O Study.

Rationale
The Regional Board recognized that salinity accumulation is a Valley-wide problem and that all water users contribute to it. Even when a grower irrigates with high-quality water, salts from that water may remain in the soil or leach to groundwater. Left unchecked, salinity accumulation will bring ongoing harm to agriculture, the environment, and the economy. As the Regional Board explained:

The salt accumulations have resulted in 250,000 acres taken out of production and about 1.5 million acres being salinity impaired. If not addressed, the economic impacts could be staggering. For example, if salt accumulations are not managed, the resulting direct economic costs to the Valley could exceed $1.5 billion per year by 2030. The Valley’s economic future depends on addressing these impacts.

Key Elements of the Basin Plan Amendments
The Basin Plan amendments give every salt discharger in the Valley a choice of permitting pathways: (1) eliminate the salt accumulation problem individually and meet stringent numeric water quality permit limitations or (2) work collaboratively toward a basin-wide salinity solution. The Regional Board set a high bar for Pathway 1, the Conservative Approach—individual dischargers must prove they have solved the salt accumulation problem by demonstrating that salt discharges will consistently remain below a stringent salinity threshold (700 μmhos/cm). For growers, that means irrigation water leaching below the root zone must consistently remain below this threshold. Meeting this threshold means that dischargers are not adding salt at a concentration that is potentially harmful to agriculture.

Tulare Lakebed De-Designation
In 2017, the Regional Board approved a Basin Plan amendment to remove municipal and agricultural beneficial use designations from a delineated portion of the groundwater in the historic Tulare Lakebed.

This change means the Regional Board relieved dischargers of requirements to ensure groundwater in this area was of high enough quality to meet municipal and agricultural water needs. This decision was made because the shallow groundwater within the Tulare Lakebed contains high levels of salt and thus was deemed unsuitable for municipal and agricultural use.

The de-designation process proceeded in coordination with the CV-SALTS program. CV-SALTS brought together a broad group of agricultural, municipal, industrial and regulatory interests to develop an overall vision and plan for addressing salinity and nitrate concerns in a comprehensive and sustainable manner.
Pathway 2, the Alternative Approach, entails a Valley-wide study (the P&O Study) of salt management actions that will lay the foundation for managing salinity accumulation long-term. This process will update information on salt sources and conditions and identify management strategies and projects to reduce and remove salts. The study is expected to take 10 years at a cost of $10 million to $15 million.

Under both pathways, existing salt management and monitoring requirements will continue. Dischargers will continue to conduct monitoring and implement actions to meet those requirements. If a discharger chooses Pathway 1, supplemental characterization studies would be required, and additional management actions may be needed to demonstrate compliance with the permitting strategy. If a discharger chooses Pathway 2, compliance includes paying a minor annual fee to support the P&O Study. However, additional salt management actions would be deferred for permittees on Pathway 2 until after the P&O Study is complete.

De-Designated Areas

In adopting the Basin Plan amendments, the Regional Board acknowledged that some areas of the Valley have been or will be de-designated for certain beneficial uses (e.g., Municipal and Domestic Supply and Agriculture) due to high salinity levels in underlying groundwater. The P&O Study will include identifying locations—such as these de-designated areas—that may serve as salt management areas that can be used to consolidate salts for desalinization or transport. In the course of adopting the amendments, the Regional Board expressed its intent that all permittees should financially support the P&O Study, including those with de-designated locations. The Board explained:

For example, a groundwater basin that has had one or more beneficial uses de-designated due to salinity may be considered a potential location for establishing a salt management area. Accordingly, under the Phase I Salt Control Program:

- Permittee(s) that selects either the Conservative [Pathway 1] or Alternative [Pathway 2] Permitting Approach and then requests the de-designation of one or more beneficial uses from a surface water body or all or part of a groundwater basin based on salinity shall participate in the P&O Study even after the beneficial use de-designation is approved by providing at least the minimum level of required financial support throughout the Phase I program. The P&O Study shall evaluate all areas de-designated based on salinity for suitability as salt management areas.

- Permittee(s) that discharges to a surface water body or a groundwater basin where one or more beneficial uses were de-designated due to salinity prior to the beginning of Phase I of the Salt Control Program shall participate in the P&O Study by providing at least the minimum level of required financial support.

Long-Term Goal for Salinity Management

The Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) developed the Basin Plan amendments and the Salt Control Program as a rational way for the Regional Board and dischargers to collectively and efficiently tackle a salinity problem that threatens the Valley’s agricultural productivity. In carefully designing these efforts with extensive stakeholder input, the Regional Board and the Central Valley Salinity Coalition provided a reasonable means for all dischargers not only to participate in the P&O Study, which will be the roadmap toward salt sustainability, but to benefit on a long-term basis. The more conservative Pathway 1 is available to permittees on an individual permitting basis but would be more costly and is less likely to be a viable, achievable approach for many areas of the Valley.

Learn More About CV-SALTS, Help Shape Your Future

You are encouraged to participate and get involved now. To learn more, visit CV-SALTS at www.cvsalinity.org. CV-SALTS is working to ensure safe, reliable water supplies for everyone in the Central Valley.
# CV-SALTS Meeting Calendar

## 2019

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**Notes/Key**

- **Light Red conflicts**
- **Third Thursdays Where possible**
- **Executive Committee Meetings**
- **Policy or Admin Calls 1:00 or 1:30pm**
- **Yellow Salty**
- **State Board Workshops/Hearings**
- **TAC Meeting**
- **PEOC Committee**

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5/31/2019