Strategic Salt Accumulation Land and Transportation Study (SSALTS)
Task 1.4 & Phase I Draft TM
SSALTS Objectives

– Identify a range of viable alternatives for salt disposal for consideration during development of the Salt and Nutrient Management Plan (SNMP).

– Provide information to help guide discussions regarding:
  • The establishment of regional salt management policies.
  • The need for changes to the existing Basin Plan to facilitate salt disposal in a manner that is most beneficial to the Central Valley.
SSALTS Objectives

– Phase 1, Characterize Existing Salt Accumulation Study Areas
  • Identify Representative Study Areas
  • Characterize study areas to establish baseline information
– Phase 2, Develop Potential Long-term Salt Management Strategies
  • In-Valley alternatives
  • Out-of-Valley alternatives, and
  • Hybrid alternatives
– Phase 3, Evaluate Potential Salt Disposal Implementation Alternatives
  • Develop and apply feasibility criteria (e.g., regulatory, institutional, economic, technological, etc.).
  • Identify and prioritize acceptable salt disposal alternatives for potential incorporation into the Central Valley SNMP.
# SSALTS Study Areas

<table>
<thead>
<tr>
<th>Section Number</th>
<th>Study Area</th>
<th>Central Valley Basin Planning Area</th>
<th>Representative Sector/Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Red Rock Ranch</td>
<td>Tulare Lake Basin</td>
<td>Agriculture</td>
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<tr>
<td>3</td>
<td>City of Dixon</td>
<td>Sacramento River Basin</td>
<td>Municipal</td>
</tr>
<tr>
<td>4</td>
<td>Westside Regional Drainage Plan</td>
<td>San Joaquin River Basin</td>
<td>Agriculture</td>
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<td>5</td>
<td>San Luis Unit Ocean Disposal</td>
<td>San Joaquin River Basin</td>
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<td>6</td>
<td>Hilmar Cheese</td>
<td>San Joaquin River Basin</td>
<td>Industrial</td>
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<td>7</td>
<td>Grasslands Water District</td>
<td>San Joaquin River Basin</td>
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<td>8</td>
<td>City of Tracy</td>
<td>San Joaquin River Basin</td>
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<td>9</td>
<td>Stevinson Water District</td>
<td>San Joaquin River Basin</td>
<td>Agriculture</td>
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<tr>
<td>10</td>
<td>Tulare Lake Bed</td>
<td>Tulare Lake Basin</td>
<td>Agriculture</td>
</tr>
<tr>
<td>11</td>
<td>Industrial Food Processing</td>
<td>Central Valley</td>
<td>Industrial</td>
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</tbody>
</table>
Study Area Characterization (Task 1.3)

- Objective is to “characterize the Study Areas based on available data/reports, discussions with affected stakeholders & reasonable extrapolations.”
  - Attributes
    - Physical,
    - Land cover,
    - Institutional, economic or regulatory obstacles
  - Sources of Salt
  - Salt Accumulation Capacity
    - Existing approaches for evaluating capacity
    - Additional opportunities to evaluate capacity
  - Cost/Benefits
  - Institutional/Regulatory Barriers
People/Agencies that Provided Comments

- Jeanne Chilcott & Rudy Schnagl (Central Valley RWQCB)
- Burt Fleischer (Hilmar Cheese Company)
- Jose Faria (DWR)
- Joe DiGiorgio (Stantec for City of Dixon)
- Rob Neenan (California League of Food Processors)
Summary of Comments Received – General Comments

- Study Area descriptions need to include the current status.
- The changing regulatory climate may mean that existing projects may not comply with new regulations. The report should include discussion of the current and future “regulatory climate.”
- Impacts to groundwater quality need to be included for each of the Study Areas.
- Short-term and long-term impacts of each Study Area should be discussed.
Summary of Comments Received – General Comments

• The Study Areas should address:
  – Whether or not they comply with current Basin Plan requirements and regulations and whether or not they will do so in the long-term (~200 years).
  – If the management of salt provides a complete solution and what steps will eventually need to be taken.
  – Where the salt ultimately ends up.
Summary of Comments Received – Red Rock Ranch

- Address why the IFDM concept has not taken off.
- Include potential IFDM WDR requirements for selenium.
- IFDM is more applicable for implementation on a regional basis.
- Water supply availability may cause a shift to permanent crops.
- There are some studies on the reuse of salt accumulated on the salt evaporator.
Summary of Comments Received – City of Dixon

- The section should include a discussion of all options analyzed by the City.
- The City will construct an activated sludge process to reduce salinity concentrations by 50% by preventing evaporation losses.
- The ban on water softeners yielded ~15% reduction in chloride.
Summary of Comments Received – Westside Regional Drainage Plan

- The Plan has not been reviewed or adopted by the RWQCB.
- A discussion on the 1996 Basin Plan amendment needs to be added.
- The Westlands Drainage District is operating as a closed basin. Currently, the salt is accumulating in the groundwater.
- Break discussion of the Study Area into a “closed system” and an “open system”
Summary of Comments Received – Hilmar Cheese Company

- The characterization should focus on current operations and not past regulatory/enforcement issues.
- Problems with compatibility of the injected concentrate and the deep aquifer. Precipitate is clogging the injection system.
- Aquifer has a higher salinity than the injected concentrate.
- The treatment system requires 24/hr monitoring. HCC has concern with the long-term sustainability of this.
Summary of Comments Received – Grasslands Real Time Water Quality Management

- This project is more of a concept than a current project.
- Address the RWQCB requirements to review and approve the project prior to implementation.
Summary of Comments Received – Tulare Lake Bed

- Use of evaporation basins has declined over past several years.
- Increasing the volume of evaporation basins has been difficult.
- Address regulations to prevent the degradation of shallow groundwater.
Summary of Comments Received – Industrial Food Processing

- The discussion of the Study Area does not put food processing discharges into context.
- Food processors only account for small percentages of salt discharges in the Central Valley (between ~2% - 4%)
Screening-Level Analysis of Long-Term Sustainability (Task 1.4)

- Objective is to analyze each Study Area “to assess their longevity & sustainability.”
  - Assessment considers 50-year increments, up to a total of 200 years.
  - Apply screening-level forecasts of known trends relative to historical, current, and future conditions at each Study Area.
  - Utilize information developed under the ICM study.
SSALTS Study Areas relative to ICM Initial Analysis Zones

- SSALTS Study Areas are distributed across the central valley
- Study Area scale ranges from very small (individual farm) to large (San Luis Unit)
- IAZ scale is not conducive to SSALTS analysis except: Westside/San Luis Unit and Tulare Lake Bed.
Screening-Level Analysis of Long-Term Sustainability (Task 1.4) continued

• Each Study Area provides potential example strategies for management of salt accumulation.
• Three broad categories:
  – Source controls or salinity management practices
  – Treatment to concentrate salt
  – Ultimate salt disposal (in-valley/out-of-valley)
• Not every study area addresses all three categories.
• Sustainability assessment requires judgment to consider likely outcomes.
Screening-Level Analysis of Long-Term Sustainability (Task 1.4) continued

- Factors considered under the sustainability assessment of each Study Area are:
  - Longevity of the project (e.g., service life)
  - Salt capacity of the disposal method
  - Regulatory requirements (e.g., permitting)
  - Capital and annual O&M costs
  - Impacts to beneficial uses
  - Potential environmental impacts (e.g., selenium impacts to birds at RRR, etc.)
  - Other considerations (population growth, cropping practices, land cover changes, water demands, public acceptance)
Screening-Level Analysis of Long-Term Sustainability (Task 1.4) continued

• Long-term Sustainability assessment
  – Salt management costs ($/ton/year)
  – Salt capacity (onsite vs. offsite, in-valley vs. out-of-valley)
  – Regulatory barriers (WDRs, existing/future Water Quality Objectives per Basin Plan)
  – Environmental concerns (selenium impacts on wildlife)
  – Project longevity (capital improvement project planning period)
• Quantitative/Qualitative Assessment (Low, Medium, or High)
Screening-Level Analysis of Long-Term Sustainability (Task 1.4) continued

• San Luis Drain Ocean Disposal Study Area (draft costs)
  – Net reduction of 500,000 tons of salt annually (Reclamation, 2006)
  – Equivalent annual costs
    • Conveyance system - $17.4M
    • Land retirement – $0.6M
    • Drainage collection system - $11.1M
    • Regional reuse facilities – $4.6M
    • Total - $33.7M
  – Annual cost for ton of salt disposal - $67/ton
Screening-Level Analysis of Long-Term Sustainability (Task 1.4) continued

- Hilmar Cheese Study Area (draft costs)
  - Trucked to EBMUD
    - Gallons trucked to EBMUD in 2012 – 37M gallons
    - EBMUD charges at $0.115/gal - $4.3M
    - Trucking costs - $2.7M
    - Annual disposal costs - $7M
  - Deep Well Injection
    - Capital costs – $2.5M
    - Annual O&M costs - $250K
    - Equivalent annual cost - $427K
Screening-Level Analysis of Long-Term Sustainability (Task 1.4) continued

• Red Rock Ranch
  – Salt accumulation area is 10,000 square feet
  – Density of coarse salt is 1.08 tons/cubic yard
  – After one year, the salt pile would be 0.2 feet high
  – After 50 years, the salt pile would be 10 feet high
Refer to Long-Term Sustainability Table (separate handout)
SSALTS Schedule Proposed Revisions

- Phase I on-hold mid-April to July 2013
- Currently completing Phase I
  - Draft Phase I Report 10/04/13
  - Final Phase I Report 10/29/13
- Phase II
  - Draft Report 12/20/13
  - Final Report 1/17/14
- Phase III – to be coordinated with Phase II Conceptual Model work plan
  - Draft Report 4/11/14
  - Final Report 5/2/14