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Cc:	Fenley, Jessell M.; Imperial, Lorena; Ramirez, Janelle
Subject:	FW: Submission of the Somavia Road Managed Aquifer Recharge Project Policy Paper
Date:	Monday, September 15, 2025 12:44:00 PM
Attachments:	20250911 - Somavia Road MAR public comment full paper.docx

Good afternoon, Directors,

I hope you're having a good day, attached for your review is email/comment.

Thank you & have a great day,

Eva Gonzales, Senior Secretary – Confidential
Monterey County Water Resources Agency
1441 Schilling Place, North Building, Salinas, CA 93901
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From: Bill Lipe <william.o.lipe@gmail.com>
Sent: Thursday, September 11, 2025 2:52 PM
To: Clerks <clerk@svbgsa.org>
Cc: ClerkoftheBoard <cob@countyofmonterey.gov>; MC Water <OfficeAssistantII@countyofmonterey.gov>; Piret Harmon <harmonp@svbgsa.org>
Subject: Submission of the Somavia Road Managed Aquifer Recharge Project Policy Paper

Dear Chair and Members of the Board,

I am submitting the attached policy paper, *Somavia Road Managed Aquifer Recharge Project: Restoring Groundwater with Common Sense in the Eastside and 180/400 Subbasins*, as a contribution to our shared mission of groundwater sustainability.

This work represents dozens of hours of effort in collaboration with my mentor, Mr. John Marihart, whose decades of lived experience in the ponding corridor provided the foundation for this concept. John's knowledge, combined with my own prior service on the SVBGSA Board, shaped this paper as a practical, locally grounded proposal.

I now write as a member of the public, offering this work as a gift to Monterey County, in the hope that the project will be formally modeled, tested, and—if confirmed—advanced as a near-term tool in addressing overdraft. The Somavia Road MAR concept is designed to complement ongoing planning while directly targeting the two most critically overdrafted areas of the SVBGSA: the 180/400 and Eastside Subbasins.

This submission is not offered as a definitive solution, but as a constructive step forward—rooted in science, landowner memory, and a spirit of stewardship. I believe it merits careful technical evaluation, and I respectfully place it before the Agency as part of the collective effort toward long-term water security. I invite the Board and staff to consider integrating this project concept into ongoing GSP technical work and modeling efforts.

Thank you for your consideration and for your ongoing leadership in this vital work.

Respectfully,

Bill Lipe

Restoring Groundwater with Common Sense in the Eastside and 180/400 Subbasins

Joint-Benefit Emphasis: This project provides a **joint benefit to both the 180/400 and Eastside Subbasins**. The **actual ponding and groundwater mounding begin within the 180/400 Subbasin** and **expand outward into areas of the Eastside**, consistent with the regional hydrogeology described in **DWR Bulletin 118** and subsequent reports. Given local gradients, mounding may **wrap around toward the Eastside cone of depression**, contributing to refilling that cone and **adding subsurface pressure back toward the 180/400**, which may help **alleviate seawater intrusion** by restoring inland hydraulic heads. *(See California Department of Water Resources 1992; Montgomery Watson et al. 1998; SVBGSA 2023)*.

I. Introduction

In a region long defined by careful stewardship and agricultural resilience, the Somavia Road Managed Recharge Project offers a grounded, rapid-response solution to the persistent overdraft challenges in the Eastside and 180/400 subbasins of the Salinas Valley Groundwater Basin. Drawing only from public-facing documents, including the 180/400 Groundwater Sustainability Plan (GSP) and MCWRA hydrologic models (MCWRA 2024), this concept proposes a modest but powerful intervention that could deliver early results while longer-term efforts remain under development.

The modeling and calibration work to fully validate the recharge mechanics remains ahead, but the foundation—hydrogeologically, historically, and practically—is strong. This document weaves together known scientific relationships, landowner observations, and historical precedent into a unifying vision of recharge that reflects both the technical and the soulful character of this place. Updates in this version incorporate refined hydrologic data (SVBGSA 2023; Tetra Tech 2015; Salinas Valley Basin GSA 2022).

II. The Lore Behind the Land: The Well Beneath the Dream (1957)

They came for oil.

It was 1957. A family drilled deep—2,600 feet into the belly of Monterey County. They found no oil. But what they did find was something older: water. Flowing at 1,700 feet. Trapped under a soft clay warning, but not sealed.

Thirty years earlier, in 1923, the river had flooded Somavia Road—and the wells on the Eastside surged to life. Locals remember. The land remembers. And when flows lean left near Jensen's Bluff, the pattern re-emerges. It's not myth. It's memory.

The Somavia concept isn't born from fantasy. It's born from lore—and confirmed by observation, by data, and by the land's own whisper.

II-A. The Geology Beneath the Lore: An Ancient Floodplain Reawakened

The conceptualized recharge zone between Somavia Road and the Chualar Bridge is not merely suggestive of opportunity; it is demonstrably ideal for deep aquifer access. Hydrogeologic data spanning over a century confirms the area's character as a fractured, ancient floodplain—a rare zone in the 180/400 Subbasin where clay confining layers thin, gap, or vanish altogether.

This corridor, seated south of a prominent deep clay lens and influenced by the Reliz Fault, the Rinconada Fault, and the Laguna Seca Anticline, presents a uniquely permeable profile:

- Fractured alluvial and fluvial materials extend to depths exceeding 1,700 feet.
- Coarse-grained sediments—sands, gravels, and loams—exhibit infiltration rates between 1–3 feet per day.
- Well logs confirm vertical continuity of permeable materials with minimal fine-grained interlayers.
- Historic and modern studies (Hamlin 1904; California Department of Public Works 1946; Durbin et al. 1978; California Department of Water Resources 1992) support both shallow and delayed deep recharge through this zone, with potential via aquitard gaps and slow leakage.

Further, the 1998 Historical Benefits Analysis by MCWRA confirmed that this stretch of river—especially near Chualar—has experienced water level increases of 5 to 15 feet from reservoir-induced recharge. In the post-dam era (1958–1994), basin-wide recharge rose by up to 30,000 acre-feet per year, with this corridor showing improved vertical percolation due to aquitard discontinuity (Montgomery Watson et al. 1998).

II-B. Influence of Salinas River Proximity and Coarse Alluvium on Deep Aquifer Recharge

The Salinas River and its adjacent coarse alluvium, particularly along the Soledad–Gonzales floodplain, are critical recharge sources for the Deep Aquifer Zone of the Salinas Valley. This zone, situated below saltwater-impacted 180- and 400-foot aquifers, is targeted for both extraction and long-term Managed Aquifer Recharge (MAR) interventions (Thorup 1976).

Proximity-Driven Recharge Dynamics

The Salinas River channel, especially north of Soledad, traverses coarse-grained alluvium, offering highly permeable substrate that facilitates deep percolation. These permeable zones enable vertical infiltration, allowing streamflow and floodwater to reach depths sufficient to recharge the Paso Robles Formation, which houses the Deep Aquifer Zone.

The report identifies alluvial fans emerging from the Sierra de Salinas as essential percolation pathways. These fans, particularly between Soledad and Gonzales, serve as natural infiltration beds where water is funneled into deeper strata due to the coarse sediment texture and gradient.

Quantitative Recharge Contributions

The Monterey County Water Resources Agency (MCWRA) estimates that approximately 50% of total annual recharge to the Deep Aquifer originates from Salinas River streamflow percolation. This recharge is augmented by controlled releases from Nacimiento and San Antonio Reservoirs, which enhance downstream flow volumes during dry periods.

Recharge by Zone

- **Upstream near San Ardo–Soledad:** Primary recharge due to persistent streamflow, bolstered by dam releases in summer and fall.
- **Soledad to Gonzales Corridor:** High percolation potential due to proximity to river and gravelly alluvium.
- **Gonzales to Spreckels:** Recharge continues but at reduced intensity due to finer sediment profiles.

Structural Support for Recharge

The Deep Aquifer Zone in this region is confined by clayey aquitards, providing vertical isolation from overlying salt-affected zones, while still being hydraulically open in areas with coarse-grained recharge windows. These structural conditions allow MAR or natural streamflow recharge to effectively reach the target depths with minimal dispersion or quality loss.

Implications for MAR Project Design

Strategic Advantages:

- Existing natural recharge pathways can be leveraged or augmented through MAR basins near the river corridor.
- The coarse alluvium offers a cost-effective infiltration medium, reducing need for artificial lining or pre-treatment.
- Predictable hydraulic response due to historical recharge patterns ensures better control of recharge timing and volumes.

Cautions:

- Need to avoid over-pumping near recharge zones, which could reverse gradients and draw in saline water from lateral boundaries.
- Fine-grained zones farther downstream may delay recharge arrival times, requiring multi-year performance tracking.

The Salinas River's proximity, especially where it flows over coarse, permeable alluvium between Soledad and Gonzales, plays a central role in naturally recharging the Deep Aquifer Zone. Estimated to contribute around 50% of recharge, streamflow is further amplified by managed dam releases, forming a hydrologically robust system that supports both groundwater sustainability and the viability of future MAR interventions.

III. Project Overview

The Somavia Road project proposes to seasonally pond water in the Salinas River to a depth of 10 feet using a temporary rubber dam. The recharge zone spans roughly 5.7 river miles upstream of Jensen's Bluff—where the river meets a geologic transition south of the deep clay confining wall of the 180/400.

The goal is not diversion or removal. Rather, it is retention—slowing flow to enable natural infiltration into the unconfined and semi-confined aquifer system.

Updated ponding footprint assumptions:

- 600 acres average ponded area
- 10 feet depth average

This allows:

- 6,000 acre-feet of water stored at a time (when full)
- Net recharge over 100 days (1–3 ft/day, minus 10–20% ET and losses): → **48,000 to 162,000 acre-feet annually**

Filling time at 175 cfs inflow:

- 1 acre-foot = 43,560 cu ft
- 6,000 acre-feet = 261,360,000 cu ft
- Daily inflow at 175 cfs = 15,120,000 cu ft/day
- **Time to fill ≈ 17.3 days**

The zone can be filled quickly during spring releases and then continuously recharged through infiltration over the target 100-day window.

IV. Alignment with Downstream Operations

The project has been explicitly designed not to interfere with downstream infrastructure, particularly the Salinas River Diversion Facility (SRDF). Key operational features:

- Ponding zone is ~15.7 miles upstream of the SRDF.
- Operations are front-loaded into the April–May window, matching reservoir release peaks.
- Rubber dam impoundment mimics natural seasonal flow patterns.

Bypass Flow Requirements:

- SRDF must maintain 45 cfs minimum for fish passage (NMFS 2007).
- MCWRA operations add buffer flows (≥10–13 cfs) to cover transmission losses (Tetra Tech 2015).
- Estimated losses over 15.7 miles: ~13 cfs average, though higher in late summer (~67 cfs).

Operational Safeguards:

- The system includes partial deflation or bypass features once infiltration capacity is reached.
- Monitoring via USGS gages (e.g., #11152300 Chualar) helps ensure compliance with SRDF and fish passage needs.

Net Effect: This is a recharge-first, non-diversion project that:

- Supports groundwater recovery
- Preserves ecological flows
- Honors downstream priorities

V. Groundwater Benefits

V-A. Chualar Corridor and Domestic Supply Security

The town of Chualar and surrounding rural homesteads operate on shallow to intermediate-depth wells vulnerable to seasonal drawdown and drought stress. These domestic and small municipal systems often sit within 1 to 3 miles of the proposed recharge site.

Using recharge volumes derived from a 600-acre footprint at 10-foot depth, and infiltration rates of 1–3 ft/day, the model estimates:

- Recharge delivery of **48,000 to 162,000 acre-feet** over 100 days
- **Water table rise (head increase):**
    - +15 to +20 ft within 0.5–1 mile
    - +5 to +10 ft within 1.5–2 miles
    - +2 to +5 ft at 3+ miles

This uplift directly benefits Chualar Public Utility District (PUD) wells and nearby domestic users by:

- Reducing pumping lift costs
- Minimizing risk of seasonal outages
- Extending well lifespan and reliability
- Increasing water quality buffer between shallow contaminants and deeper aquifers

Furthermore, this zone lies at a hydrologically strategic transition area, where the Salinas Aquitard becomes discontinuous. This structural trait enhances the vertical hydraulic connection between recharge waters and deeper aquifers.

The 1998 Historical Benefits Analysis corroborated this, showing +5 to +15 feet of groundwater elevation rise over decades from reservoir-supported river flows, particularly in the Chualar reach (Montgomery Watson et al. 1998).

V-B. Nitrate Dilution Potential

Though the Somavia Road MAR project is not designed as a treatment system, it offers a plausible co-benefit for nitrate mitigation, especially in areas with shallow agricultural contamination.

Key dynamics:

- Source water from Nacimiento/San Antonio is low in nitrate (<5 mg/L NO_3-N)
- Regional shallow aquifers often exceed 25–60 mg/L NO_3-N
- Infiltration of clean water may dilute nitrate concentrations within the cone of influence

Conservative scenario-based estimate:

- **Within 0.5–1.5 miles of the recharge zone:**
  - 10–25% nitrate reduction via mixing over 1–3 years
  - Especially helpful to vulnerable domestic users

Long-term benefits:

- Slows vertical migration of nitrate into deeper formations
- Expands safe yield envelope for small systems
- Aligns with SGMA's water quality degradation sustainability indicator

Limitations and future work:

- Actual nitrate movement depends on local gradients, soil redox conditions, and residence time
- MT3DMS or SEAWAT transport modeling could validate
- Empirical well monitoring should be used to track water quality response over time

VI. Timing, Feasibility, and Local Access

The Somavia Road Managed Aquifer Recharge (MAR) project is designed for swift deployment, relying on existing public knowledge, and known hydrology. Several features make this site exceptionally feasible and low-barrier:

A. Geotechnical Favorability

The reach exhibits:

- High-permeability riverbed materials (coarse sand/gravel)
- Lack of confining clay in the upper layers
- Hydraulic connectivity to deeper aquifers through known geologic windows

This makes infiltration highly efficient and helps explain why ponding in this zone historically triggers measurable groundwater response.

B. Operational Simplicity

The project requires:

- A temporary rubber dam system (existing analogs exist in California)
- Seasonal scheduling (e.g., April–June) to capture reservoir releases
- Minimal construction, and no long-term diversion infrastructure
- Bypass capability to ensure uninterrupted downstream flow to SRDF

At 175 cfs, the entire 6,000 acre-feet of ponding volume could be filled in approximately **17.3 days**, maximizing responsiveness to hydrologic windows without large infrastructure delays.

C. Alignment with Existing Models

The site can be simulated with minimal effort in:

- SVOM / SVIHM (USGS model of Salinas Valley)
- MCWRA river and aquifer models
- Publicly available SGMA tools for recharge evaluation

This allows technical agencies to evaluate recharge performance without constructing new models from scratch.

D. Construction and Permitting Timeline

The project's non-diversionary, in-channel character may allow for expedited permitting under:

- SGMA recharge streamlining protocols
- CEQA categorical exemptions or mitigated neg-decs
- Temporary use permits for dam placement
- Encroachment or coordination permits via Monterey County or MCWRA

Local partners can leverage the urgency of overdraft mitigation and community water resilience to seek grant funding or fast-track processes.

VII. Why This Matters Now

The Somavia Road MAR project is not just technically sound—it is strategically timed, socially resonant, and politically pragmatic.

A. Complementarity, Not Competition

This project does not displace or undermine existing SVBGSA or MCWRA recharge proposals. Instead, it fills a strategic gap:

- **Eastside Focus:** Most projects concentrate on the Forebay, Pressure, or coastal zones. Somavia centers on a part of the Eastside that remains hydrologically critical but underutilized for recharge.
- **Non-Diverted:** By retaining water in-channel and avoiding pumped or piped diversions, it avoids many regulatory hurdles.
- **Quick Activation:** With willing landowners and public documentation already in place, the project can move faster than infrastructure-heavy alternatives.

B. Public Signal and Stakeholder Trust

In an environment of skepticism and concern over SGMA implementation, the Somavia project provides:

- A symbolic gesture that action is underway
- A demonstration site for how science, local knowledge, and community cooperation can align
- A low-cost proof-of-concept for deeper MAR efforts

Local growers and rural residents have expressed fatigue at long timelines and abstract planning. This project shows movement—and movement builds trust.

C. Alignment with SGMA and Funding Criteria

Somavia Road MAR directly supports SGMA sustainability indicators:

- **Chronic Lowering of Groundwater Levels:** Raises heads in critical Eastside areas
- **Seawater Intrusion:** Repressurizes freshwater gradients
- **Water Quality:** Offers nitrate dilution co-benefits
- **Degraded Storage:** Refills deep and semi-confined aquifers
- **Depletions of Interconnected Surface Water:** Restores seasonal baseflow through infiltration pulses

These benefits enhance eligibility for state and federal funding, including:

- DWR's SGMA Implementation Grants
- USDA WaterSMART
- Proposition 1 and 68 MAR funds
- Clean Water State Revolving Fund (for nitrate co-benefits)

D. Cost-Efficiency

Compared to large-scale capital MAR programs, Somavia is:

- Scalable
- Low-maintenance
- Quick to evaluate, quick to adapt

A single season of operation can yield multiple years of data to inform the broader GSP implementation plan.

VIII. The Soul Beneath the Concept

This project is shaped not only by hydrology and policy but by something deeper—a philosophy of listening to the land.

One grower involved in shaping this concept said it plainly:

“The land knows what it wants to do. It remembers where the water used to go.”

This isn’t romanticism—it’s observational science. The 1957 well. The 1923 flood. The surge in Eastside wells. The geology that agrees.

Landowners who’ve farmed here for generations carry hydrologic memory in their bones. They understand when a field dries too early, when a pump labors harder than it used to, when the river’s flow no longer sings the way it did in their grandfather’s time.

This is a project born from quiet confidence, not spectacle. It is a gesture of stewardship, a way of saying: We can act now. With purpose. With humility. With honor.

This project is not just about MAR. It’s about moral MAR—a version of managed aquifer recharge that values timing, fairness, listening, and equity as much as flow, head, and gradient.

It’s not just about water.
It’s about doing the right thing, at the right time, in the right place.

IX. Bibliography (CSE Name-Year Format)

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X. Appendix A: Conceptual Recharge Simulation (100-Day Scenario)

This appendix presents a non-modeled, pre-simulation scenario assessment based on the USGS Salinas Valley Integrated Hydrologic Model (SVIHM/SVOM) preprint and publicly available documentation. It is designed to frame expectations and uncertainty ranges for the Somavia Road recharge zone prior to formal modeling.

A1. Assumptions and Inferred Parameters

- **Hydraulic conductivity (K):** 50–150 ft/day (base: 100) for coarse riverbed and floodplain alluvium
- **Specific yield (Sy):** 0.10–0.20 (base: 0.15)
- **Recharge infiltration rate:** 1–3 ft/day over 600 acres (updated surface footprint)
- **Effective aquifer thickness (b):** ~200 ft
- **Transmissivity (T):** T = K × b = 10,000–30,000 ft^2/day
- **Pressure diffusion radius estimate:** ~1.5–3.5 miles over 100 days

A2. Estimated Recharge Outcomes (100 Days)

- **Gross recharge potential:**
  - 1 ft/day × 600 acres × 100 days = 60,000 AF
  - 3 ft/day × 600 acres × 100 days = 180,000 AF
- **Net recharge (after 10–20% losses):** ~48,000 – 162,000 AF
- **Storage increase localized to Eastside region:** ~42,000 – 145,000 AF
- **Estimated head response:**
  - At 0.5 mi: +15 to +30 ft
  - At 1.5 mi: +7 to +15 ft
  - At 3.0 mi: +2 to +7 ft

A3. Observed and Projected Impacts

- **Domestic and municipal wells (e.g., Chualar):**
  - Up to 25% drawdown relief in high-stress months
  - Improved reliability and decreased energy costs
- **Pressure response radius (≥2 ft head rise):** ~2.5–3.5 miles
- **Storage retention post-recharge (6–12 months):** ~50–70% of initial gain retained, depending on regional extractions

A4. Key Constraints and Feedbacks

- **Reservoir operations:**
  - 175 cfs spring flows assumed; potential constraints during dry years
- **Clogging risk:**
  - Low during 75–100 day operation; increases past 125 days without sediment management
- **SRDF compatibility:**
  - Managed bypass flow ≥58 cfs needed
  - Includes 45 cfs minimum fish passage (NMFS 2007) + 10–13 cfs for SRDF diversion thresholds (MCWRA 2020)

A5. SGMA Framing and Recommendations

- **Groundwater offset potential:** Recharge volume offsets ~5–10% of annual dry-year pumping basin-wide
- **SGMA alignment:** Supports Eastside GSP recharge targets, nitrate mitigation, and equity goals
- **Recommendations:**
  - Initiate staged pilot (e.g., 75 → 100 → 125 days)
  - Install head monitoring wells at 0.5, 1.5, and 3 miles
  - Coordinate with SVBGSA modeling team to simulate full aquifer response and recovery lag

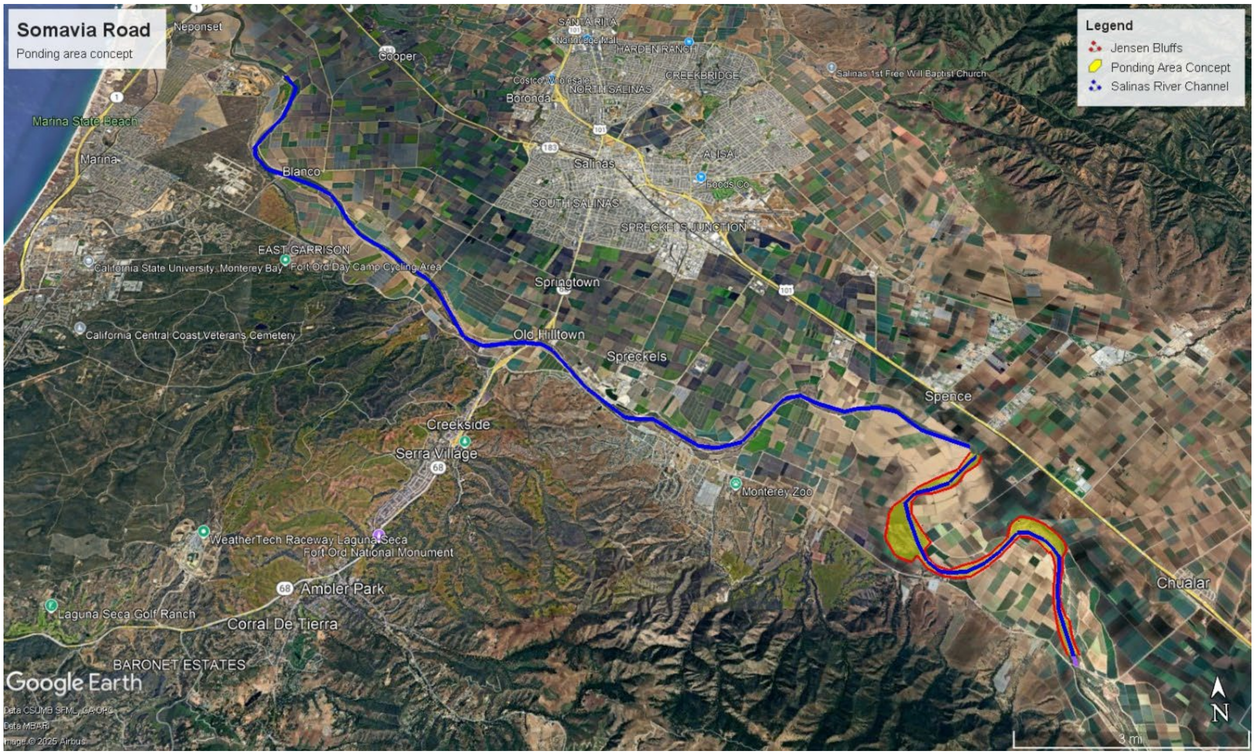
(Adapted from conceptual simulation based on USGS SVIHM/SVOM documentation and regional recharge analogs.)

XI. Exhibits

Exhibit A: Somavia Road Ponding Area Concept – Upstream Detail

This position paper relies on public, previously published studies and reports and incorporates local observations. **All specific hydrologic outcomes, spatial extents of mounding, nitrate dilution estimates, and interactions with the Eastside cone of depression require formal modeling and monitoring to confirm or refute.** Citations have been provided where available (e.g., **California Department of Water Resources 1992; Montgomery Watson et al. 1998; Tetra Tech 2015; MCWRA 2020, 2024; SVBGSA 2023; Salinas Valley Basin GSA 2022; NMFS 2007; Thorup 1976**).

Exhibit B: Salinas River Ponding Corridor – Regional Context



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