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To: Monterey County Water Resources Agency (MCWRA)
From: Fernando DePaolis, Ph.D.
Date: May 19, 2026
Re: Scope of Work — Economic Value of Groundwater Recharge, Salinas Valley

Background

The Monterey County Water Resources Agency (MCWRA) operates the Nacimiento and San Antonio Reservoirs to deliver surface water, recharge groundwater, and support the Salinas Valley's \$5 billion agricultural industry. These operations are essential to farming and economic activity across Monterey County.

Existing economic studies have not isolated the specific value of groundwater recharge from MCWRA dam operations. Although recharge is vital to the region's economy, no prior analysis quantifies its value as an independent benefit.

This scope outlines a new economic analysis to directly quantify the annual dollar benefit of MCWRA's groundwater recharge, both basin-wide and by subbasin. The approach uses current data and is designed to be legally defensible for SGMA compliance.

Study Objectives

We will conduct this study to:

- Quantify, in annual dollar terms, the economic benefit of groundwater recharge from MCWRA's Nacimiento and San Antonio reservoir operations, with results presented for the entire basin and for each subbasin.
- Base these benefit values on locally sourced, peer-reviewed economic data and findings from previous reports, eliminating the need for new economic assumptions.
- Produce a clearly documented and defensible economic figure for MCWRA to use in communications with ratepayers, the SVBGSA, and state regulators, ensuring it withstands technical and legal scrutiny.
- Develop a reliable analytical foundation, including an updated, replicated IMPLAN model, to support future economic studies related to MCWRA's operations.

Analytical Approach and Study Levels

The study is organized into three nested analytical levels, each building on the previous one. This structure allows MCWRA to review findings at each stage and benefit from a fully integrated final product.

The analysis uses an avoided-cost approach: each acre-foot of water recharged to the Salinas Valley aquifer offsets an equivalent shortage cost. We use shortage costs from ERA Economics' locally calibrated model of the Salinas Valley agricultural economy and apply them to measured recharge volumes from MCWRA's operations, as documented in the River Series.

Level 1: Analytical Baseline and Initial Estimates

Level 1 establishes the analytical foundation for the study and serves as a standalone deliverable with initial estimates and a documented gap analysis.

Task 1.1 — Document Review and Gap Analysis

We will review all relevant source documents, note key data (such as \$/AF values, loss rates, and water-year classes), and identify gaps that require further data requests from MCWRA.

Task 1.2 — Data Request and Coordination

We will request from MCWRA: (1) annual reservoir releases by dam for at least ten years; (2) typical or actual seasonal release durations; and (3) multi-year average loss ratios to supplement River Series data. We will also begin coordinating with ERA Economics on IMPLAN data access.

Task 1.3 — Reach-to-Subbasin Mapping

We will align River Series measurement sites and reach boundaries with MCWRA subareas and DWR subbasins to ensure hydrologic consistency before calculations.

Task 1.4 — Preliminary Benefit Estimates

Using available data and interim assumptions, we will calculate preliminary recharge volumes by area, apply ERA's \$/AF values to estimate initial benefits, and present low and high ranges. Interim assumptions will be replaced with actual data in Level 2.

Level 1 Deliverables

- Written summary of source documents reviewed, and data gaps identified.
- Formal data request letter to MCWRA staff.
- Reach-to-subbasin mapping table with supporting documentation.
- Preliminary benefit estimate table: basin-wide and by subarea, with low/high range.
- Interim assumptions log documenting all estimates pending the availability of actual data.

Level 2: Integrated Benefit Valuation

Level 2 replaces all interim assumptions from Level 1 with actual MCWRA operational data and provides the study's primary quantitative result: a documented, defensible annual benefit value for groundwater recharge attributable to MCWRA's dam operations.

Task 2.1 — Annual Recharge Volume Calculation

Using reservoir release records from Task 1.2, we will calculate annual release volumes, apply reach-specific loss ratios (River Series 2025-Table 4), and compute annual recharge volumes for each subarea. For each water year, we will average results across wet, dry, and normal-year types per the River Series classification, providing multi-year averages and ranges that reflect hydrologic variability.

Task 2.2 — Subbasin Benefit Calculation

We will combine annual recharge volumes from Task 2.1 with ERA's subbasin-specific per-AF values to estimate annual benefits for each of the three River Series subareas (Upper Valley, Forebay, Pressure/180/400-Foot). Using ERA's 10% and 20% shortage scenarios, we will provide low, central (weighted average based on current SGMA compliance), and high estimates, and sum the subarea estimates to obtain a basin-wide total.

Task 2.3 — Sensitivity Analysis

We will analyze how results change with different release durations, loss ratios, and \$/AF values, and document which inputs have the greatest impact.

Task 2.4 — Seawater Intrusion Supplemental Analysis

Recharge in the lower river reaches benefits the same area targeted by the BGRP. Using the BGRP feasibility study as an independent, infrastructure-based valuation benchmark, we will estimate the supplementary benefits of abating seawater intrusion in the lower basin reaches.

Level 2 Deliverables

- Annual recharge volume table by subarea and water year type, with full data provenance.
- Subbasin benefit value table: low, central, and high estimates for each subarea and basin total.
- Sensitivity analysis table with key assumptions and result ranges.
- Supplemental benefit estimate of seawater intrusion abatement with supporting documentation.
- Consolidated Level 1–2 interim report suitable for MCWRA review and feedback.

Level 3: IMPLAN Replication, Update, and Regional Economic Effects

Level 3 extends the avoided-cost benefit analysis with a full regional economic effects analysis using the IMPLAN input-output framework. We will replicate ERA's published IMPLAN results as a reference baseline, then update them with 2024 data to reflect current economic conditions in Monterey County.

Task 3.1 — IMPLAN Data and Model Specifications

We will request ERA Economics' IMPLAN model specifications through MCWRA, including selected industry sectors, the approach to geographic customization for Salinas Valley agriculture, and the input-shock construction methodology. We will secure IMPLAN 2024 data for Monterey County and document the replication of the 2014 results (for comparability with ERA) and the update to the 2024 data, to ensure current defensibility and future extensions.

Task 3.2 — Replication of ERA IMPLAN Results

Using ERA's published inputs and model specifications, we will independently replicate ERA's IMPLAN analysis using 2014 data. Our purpose is not to audit ERA's work, which is of high quality, but to establish a fixed analytical reference point for tracing this study's results. We will document and resolve any material discrepancies between our replication and ERA's published figures before proceeding.

Task 3.3 — Updated IMPLAN Analysis (2024 Data)

We will apply the IMPLAN analysis using 2024 Monterey County data, with the same industry-sector structure and input-shock methodology as in Task 3.2. The 2024 update captures structural changes in the Salinas Valley economy over the past decade, including shifts in labor costs, supply chain relationships, and the agricultural sector's composition, which inflation-adjusted 2014 figures may not fully reflect.

Task 3.4 — Regional Economic Effects of Recharge

We will use the recharge benefit values from Level 2 as the input shock for the updated IMPLAN model, producing estimates of the direct, indirect, and induced economic effects of groundwater recharge on the Monterey County economy. Outputs will include employment (FTE), labor income, value added, and gross output, consistent with ERA's BGRP analysis presentation for direct

comparison. We will explore the appropriateness of including tax revenues in the task results. We will present results by water-year type (wet, dry, average) to reflect the variability documented in the River Series.

Level 3 Deliverables

- IMPLAN replication memorandum documenting model specifications, inputs, and comparison to ERA published results.
- Updated IMPLAN analysis using 2024 Monterey County data with full methodology documentation.
- Regional economic effects: employment, labor income, value added, output, and fiscal effects attributable to recharge, by subarea and basin total.
- Final integrated report incorporating all Level 1, 2, and 3 findings, with executive summary, methodology, results, and implications for cost recovery and ratepayer communications.
- Presentation deck suitable for MCWRA staff, SVBGSA, and public audiences.

Schedule

We will conduct the study as a dedicated full-time engagement beginning in late May 2026 and deliver an advanced draft of the full integrated report (all three levels) by July 31, 2026. Table 1 shows the anticipated timeline for each task. A final schedule will be provided once the effective start date is set.

Table 1. Proposed Schedule

Task	May 2026	June 2026	July 2026
Task 1.1 — Document Review & Gap Analysis	█		
Task 1.2 — Data Request & Coordination	█	█	
Task 1.3 — Reach-to-Subbasin Mapping	█		
Task 1.4 — Preliminary Benefit Estimates	█		
Level 1 Interim Report		█	
Task 2.1 — Annual Recharge Volume Calculation		█	
Task 2.2 — Subbasin Benefit Calculation		█	
Task 2.3 — Sensitivity Analysis		█	
Task 2.4 — Seawater Intrusion Supplement		█	
Level 1–2 Interim Report (MCWRA Review)		█	
Task 3.1 — IMPLAN Data & Model Specs		█	
Task 3.2 — IMPLAN Replication (2014 data)		█	
Task 3.3 — Updated IMPLAN Analysis (2024 data)			█
Task 3.4 — Regional Economic Effects			█
Final Integrated Report (Advanced Draft)			█

Note: Level 1 interim report to be submitted to MCWRA in mid-June for early feedback. Level 1–2 interim report to be submitted in late June. Final advanced draft by July 31, 2026.

Budget

Table 2 presents the proposed budget. Dr. Fernando DePaolis provides all professional services at a rate of \$285 per hour. The budget reflects dedicated full-time engagement on this project from late May through July 2026.

Table 2. Proposed Budget

Task	Description	Hours	Cost @ \$285/hr
Level 1: Analytical Baseline and Initial Estimates		62	\$17,670
1.1	Document review and gap analysis	16	\$4,560
1.2	Data request, coordination with MCWRA and ERA	10	\$2,850
1.3	Reach-to-subbasin mapping	10	\$2,850
1.4	Preliminary benefit estimates and assumptions log	16	\$4,560
	Level 1 interim report	10	\$2,850
Level 2: Integrated Benefit Valuation		74	\$21,090
2.1	Annual recharge volume calculation	18	\$5,130
2.2	Subbasin benefit calculation	16	\$4,560
2.3	Sensitivity analysis	14	\$3,990
2.4	Seawater intrusion supplemental analysis	14	\$3,990
	Level 1–2 consolidated interim report	12	\$3,420
Level 3: IMPLAN Replication, Update, and Regional Effects		90	\$25,650
3.1	IMPLAN data acquisition and model specs	12	\$3,420
3.2	Replication of ERA IMPLAN results (2014 data)	24	\$6,840
3.3	Updated IMPLAN analysis (2024 data)	24	\$6,840
3.4	Regional economic effects of recharge	18	\$5,130
	Final integrated report and presentation deck	12	\$3,420
Direct Costs			
	IMPLAN 2024 data — (estimated; see note)		\$10,000
TOTAL LABOR		226	\$64,410

Budget Notes

- Professional services are provided exclusively by Dr. Fernando DePaolis at \$285/hour. No subcontractors or associate staff are included.
- We have estimated the cost of the IMPLAN 2024 data pending confirmation of the appropriate licensing option. A statewide license would provide MCWRA with access to this project and all future related studies that may use IMPLAN.

- We do not anticipate travel expenses; we will conduct all meetings virtually unless MCWRA requests otherwise.
- We may revise the budget following receipt of the data request response (Task 1.2) if the scope of IMPLAN coordination differs materially from current assumptions.

Closing and Authorization

If MCWRA accepts this scope of work, we will commence work within one week of written authorization. We will submit the first deliverable — a written summary of the document review and a formal data request to MCWRA staff — within two weeks of the start date.

We will submit monthly invoices with brief progress summaries. MCWRA may provide written comments on each interim report, and we have included one round of revisions in the budget for each level. We will address additional revisions or scope changes by written amendment.

We look forward to working with MCWRA on this study and delivering analysis that meaningfully advances the agency's ability to communicate the value of its infrastructure investments to stakeholders and the public.

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