Appendix HYDRO-2

Applying the Salton Sea Accounting Model to the CVWD WRP 4 Recycled Water Project

The Appendices herein contain supporting information referenced in the Environmental Impact Report. These appendices contain highly detailed figures and other graphic information which are difficult to translate for screen reading software; therefore, the Appendices have not been translated into an auditory format. If you have a disability and/or have difficulty accessing any material in this document, please contact us by mail, email, or telephone, and we will work with you to make all reasonable accommodations. Please indicate 1) the nature of the accessibility need; 2) your preferred format; 3) the material you are trying to access and its location within this document; and 4) how to reach you if questions arise while fulfilling your request. You can direct your requests to William Patterson (wpatterson@cvwd.org).

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memorandum

date	June 9, 2025
to	Carlos Huerta, CVWD; William Patterson, CVWD; Jignesh Ladhawala, CVWD
from	Byron Amerson, ESA; Tom Barnes, ESA; Sarah Spano, ESA
subject	Applying the Salton Sea Accounting Model (SSAM) to the CVWD WRP 4 Recycled Water Project (proposed project)

Introduction

This memorandum has been prepared to evaluate potential effects to the Salton Sea elevation, salinity, and exposed lakebed acreage that could occur with implementation of the Water Reclamation Plant No. 4 Non-Potable Water Improvements Project (proposed project or WRP 4 Project). Currently, WRP 4 discharges an annual average of 5.7 million gallons per day (MGD) to the Coachella Valley Stormwater Channel (CVSC). The proposed project would change the point of discharge and use this flow for beneficial use by providing agricultural irrigation water. The reduction in WRP 4 treated effluent discharge to the CVSC would occur in increments as each phase of the proposed project is constructed. Phase 1 would reduce the discharge to the CVSC by 1 MGD by 2027; Phase 2 would reduce the discharge to the CVSC by 2.5 MGD by 2030; and Phase 3 would reduce the discharge to the CVSC by 5.7 MGD by 2035.

The Coachella Valley Water District (CVWD) has received comments regarding the proposed project impact on the Salton Sea from various groups during the EIR NOP scoping, as well as during the notification period of the Wastewater Change Petition (WW0093). CVWD recognizes the contribution of WRP 4 wastewater discharges to the inflows of the Salton Sea. This Memorandum presents an evaluation of the proposed project's contribution to conditions in the Salton Sea considering foreseeable cumulative inflow reductions. The analysis utilizes the Salton Sea Accounting Model (SSAM) developed by the US Bureau of Reclmation to assess impacts on the Salton Sea from the projected cumulative inflow reductions. This analysis compares the proposed project's inflow reductions with existing conditions and with estimated future conditions as anticipated by other water management planning efforts underway in the Coachella Valley, including the Salton Sea Management Program (SSMP) *Long-Range Plan, 2024 (LRP, 2024)* and the *2022 Indio Subbasin Water Management Plan Update, Sustainable Groundwater Management Act Alternative Plan (Indio Subbasin GSAs 2021)*, referred to here as the 2022 WMP.

This memo is organized in two sections. The first section estimates the effects of the proposed Project's inflow reductions to the Salton Sea compared with existing inflow volumes from the Coachella Valley. The second section compares the proposed project with future conditions that are projected to occur with

implementation of the 2022 WMP projects. Each section includes background, methods, and results sections for the two assessments.

Section 1: Proposed WRP 4 Project Compared to Existing Coachella Valley Inflow Conditions Provided by the Long Range Plan Annual Report

Background

The SSMP was initiated by the California Natural Resources Agency (CNRA) in collaboration with the California Department of Water Resources (DWR) and the California Department of Fish and Wildlife (CDFW) to develop and implement habitat enhancement and dust suppression projects at the Salton Sea. The SSMP Team is currently implementing its Phase 1:10-Year Plan. The 10-year Plan aims to establish at least 14,900 acres of aquatic habitat and up to 14,900 acres of dust suppression projects by the year 2028. In 2024, the SSMP Team published the final Long-Range Plan (LRP) to comply with State Water Board Revised Order WR 2002-0013 (Order). The LRP identifies concepts for long-term restoration of the Sea beyond the scope of the SSMP's 10-Year Plan. The goal of the LRP is to protect or improve air quality, water quality, and wildlife habitat beyond 2028 to prevent or reduce adverse consequences from the anticipated long-term recession of the Salton Sea shoreline. The LRP restoration concepts are based on the most reasonably foreseeable inflows to the Salton Sea using the latest projections for future water inflows. The SSMP Team publishes an LRP Annual Report every year that includes recorded annual inflow data from various sources including the Coachella Valley.

The LRP utilized a modeling tool called the Salton Sea Accounting Model (SSAM) to estimate the effects of reduced inflow to the Salton Sea on elevation, salinity, and exposed playa area. The SSAM is a spreadsheet model that incorporates bathymetry, evaporation, and future inflow projections. The SSAM is updated with available annual data to calibrate the model with observed annual conditions. The LRP considered three Future Inflow scenarios: a high probability, low probability, and a very low probability. The LRP estimates future conditions at the Salton Sea based on the high probability inflow scenario, which assumes that the inflows from the Coachella Valley will be reduced to 70,000 AFY by 2040. This estimate was made in anticipation of future flow reductions including recycled water diversions at WRP 4. **Table 1** summarizes the inflow contributions from various sources by the year 2045 as provided in Table 3-3 of the LRP, including three potential future scenarios. As shown in Table 1, the differences for each scenario were entirely within the Imperial Valley inflows. Ultimately, the LRP selected the High Probability Flow Scenario, concluding that the Low and Very Low Scenarios were "exceedingly unlikely" (DWR and CDFW, 2024; page 53). As a result, the LRP utilizes the SSAM to assess conditions in the Salton Sea under the High Probability Inflow Scenario.

TABLE 1
SSAM REGIONAL FUTURE INFLOW ASSUMPTIONS IDENTIFIED IN THE LRP IN ACRE-FEET PER YEAR (AFY)

Inflow Scenario Name	Imperial Valley Inflow	Mexico Inflow	Coachella Valley Inflow	Local Watershed Inflow	Groundwater Inflow	Total Inflow[1]
High Probability Inflow	852,900	0	70,000	4,680	11,900	889,000
Low Probability Inflow	647,900	0	70,000	4,680	11,900	684,000
Very Low Probability Inflow	407,900	0	70,000	4,680	11,900	444,000

1. The three inflow scenarios include 50,000 AFY inflow reduction due to lithium allocation. Totals are rounded to the nearest 1,000.
Source: Table 3-3 from LRP, 2024

Methods

The SSAM was used to estimate future conditions of the Salton Sea elevation, salinity, and acreage of exposed lakebed with and without the proposed project using the most recently updated data sources for bathymetry and freshwater inflows to the sea. The SSAM was updated to present existing inflows from the Coachella Valley as a five-year average of Coachella Valley annual inflow reported in the SSMP 2024 Annual Report published in March 2025[1]. The Coachella Valley future inflows represented in the LRP projections were reduced annually in a linear progression from the most recent five-year average to reach 70,000 AFY by the year 2040 as shown in Table 2. The SSAM outputs provide a comparison of the proposed Project with the existing Coachella Valley inflows to the Salton Sea as reported by the 2025 LRP Annual Report. **Table 2** summarizes the existing and estimated future inflows from the Coachella Valley to the Salton Sea. **Figure 1** plots these Coachella Valley inflow estimates. These Coachella Valley inflows were used in the SSAM model to compare the project's estimated effects with the existing inflow volumes and with future inflows as estimated in the LRP. **Table 3** summarizes the planned WRP discharge reductions and the year that each phase is planned to be implemented.

Estimates of future inflows to the Salton Sea from sources other than Coachella Valley were kept the same in the model runs as those reported in Appendix A of the LRP, except for the addition of updated 2023 inflow data, and the inclusion of the proposed reduction of Imperial Irrigation District (IID) inflows for 2023 through 2026 that are part of the 2024 - 2026 Temporary Colorado River System Water Conservation Project (USBR 2024). The IID inflow reductions are proposed maximum volumes that may occur within the next three years under the USBR Conservation Project. They are included in this analysis to provide a conservative view of potential cumulative flow reductions.

1 https://saltonsea.ca.gov/annual-reports/

TABLE 2
COACHELLA VALLEY INFLOWS TO THE SALTON SEA USED IN THE SSAM EXISTING CONDITIONS COMPARISON

Year	Existing Inflows from the Coachella Valley (AFY)[1]	LRP High Probability from the Coachella Valley (AFY)	Existing Conditions minus the Proposed WRP 4 Project in Three Phases (AFY)
2024	77,000	77,000[1]	77,000
2025	77,000	76,563	77,000
2026	77,000	76,125	77,000
2027	77,000	75,688	75,880
2028	77,000	75,250	75,880
2029	77,000	74,813	75,880
2030	77,000	74,375	74,200
2031	77,000	73,938	74,200
2032	77,000	73,500	74,200
2033	77,000	73,063	74,200
2034	77,000	72,625	74,200
2035	77,000	72,188	70,615
2036	77,000	71,750	70,615
2037	77,000	71,313	70,615
2038	77,000	70,875	70,615
2039	77,000	70,438	70,615
2040	77,000	70,000	70,615
2041	77,000	70,000	70,615
2042	77,000	70,000	70,615
2043	77,000	70,000	70,615
2044	77,000	70,000	70,615
2045	77,000	70,000	70,615

1. Source: 2025 LRP Annual Report, 5-year average 2021-2025

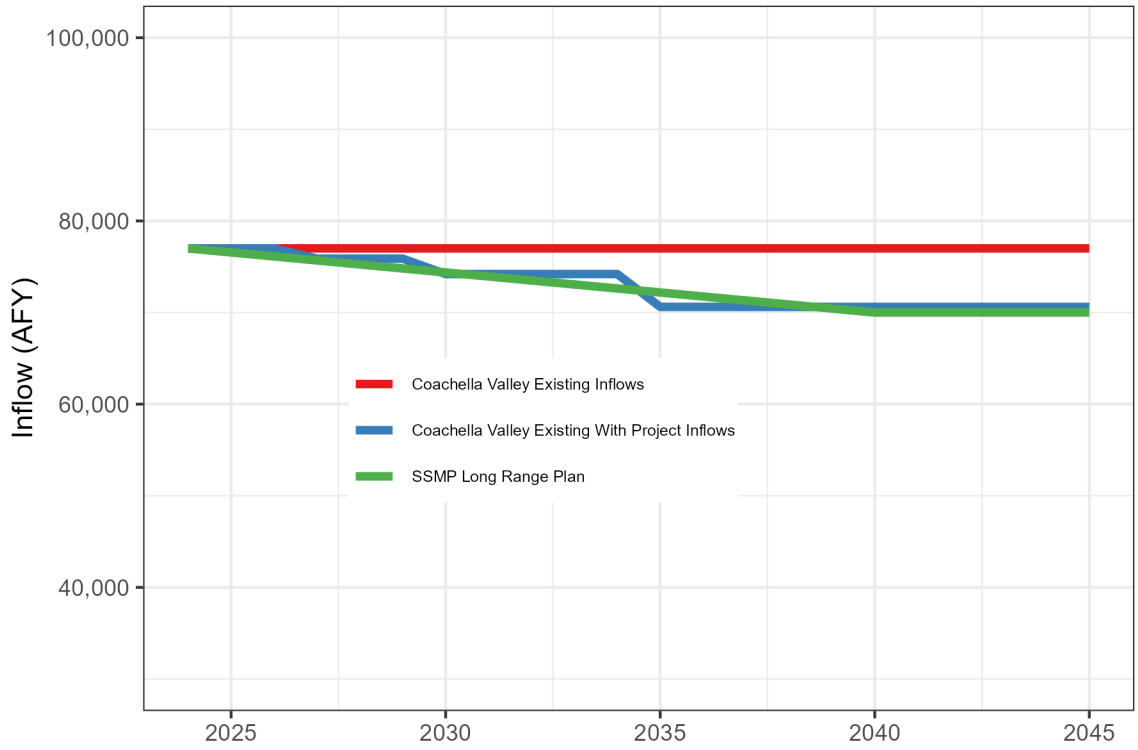

Figure 1
Estimated Coachella Valley Inflows (AFY).

TABLE 3
WRP-4 PROJECT DISCHARGE TO THE CVSC USED IN THE SSAM ANALYSIS

Phase	Years	Proposed WRP-4 Discharge to CVSC (AFY)
	2024 – 2026	6,385
Phase 1	2027 – 2029	5,265
Phase 2	2030 – 2034	3,584
Phase 3	2035 – 2045*	0

Note:
For conservative modeling purposes, we have assumed Phase 3 discharge will be entirely eliminated starting in 2035, which is the earliest year the full discharge could be potentially eliminated. Dates are estimates and may change based on grant approvals and permitting.

Results and Conclusions

The SSAM estimates effects on the Salton Sea elevation, salinity, and exposed playa assuming existing Coachella Valley inflow conditions with and without the proposed Project. The assessment also includes the estimates assumed in the LRP. **Figures 2 through 5** show the resulting cumulative effects to Salton Sea elevation, salinity, and exposed playa acreage. Tabular presentations of the results for all model years follow in **Tables 4, 5,** and **6**. Comparative summaries are presented in **Table 7** and **Table 8.** A summary of modeled outputs at the implementation date of each project Phase is included in **Table 9**. As shown in

the figures and tables, the Coachella Valley Existing Flows with WRP 4 Project estimate is similar to the LRP projection through 2045.

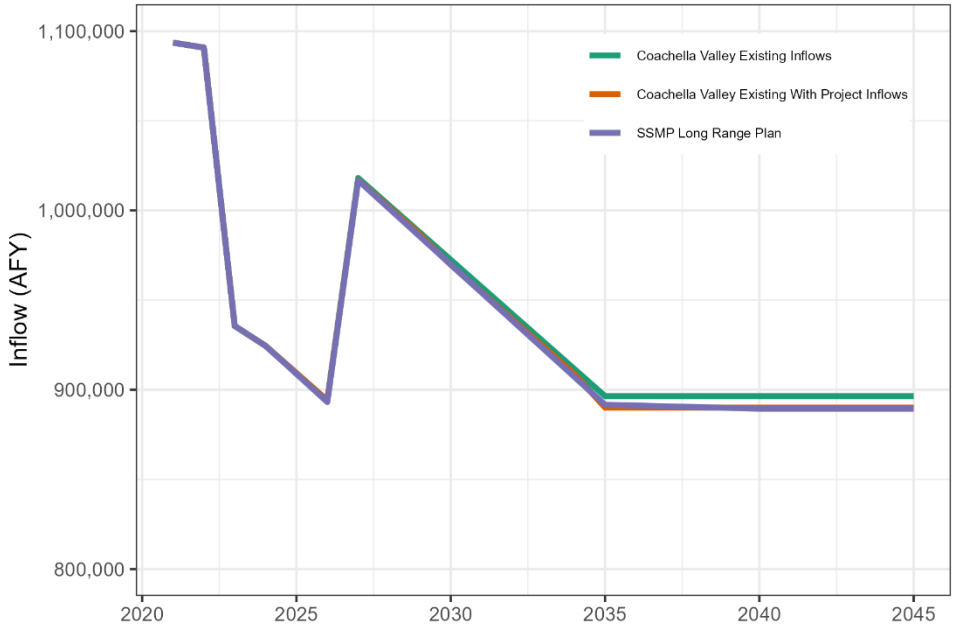

Figure 2
Modeled estimates of Total Salton Sea inflow (AFY).

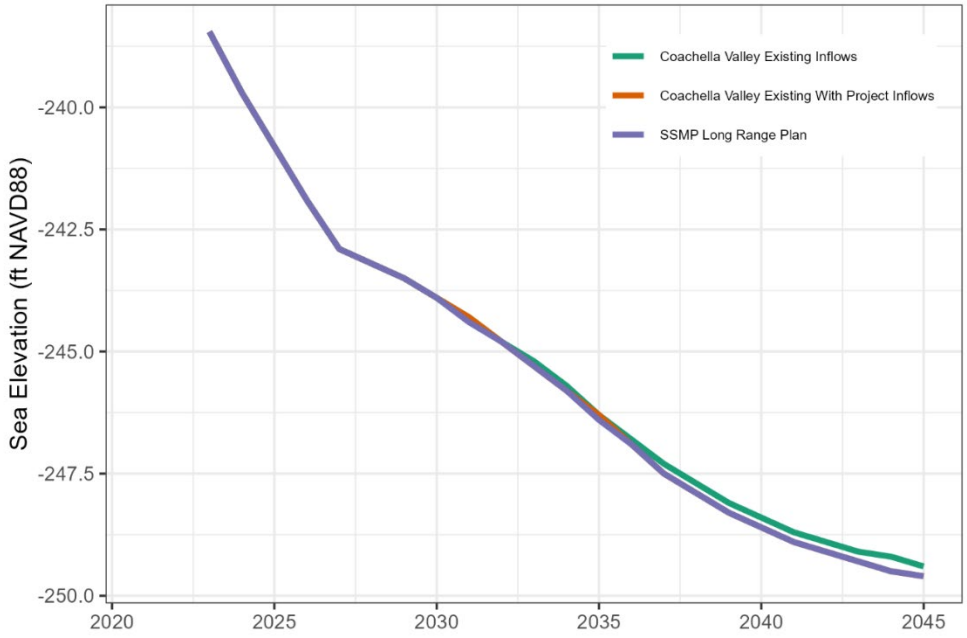

Figure 3
Modeled estimates of Salton Sea elevation (NAVD88 feet).

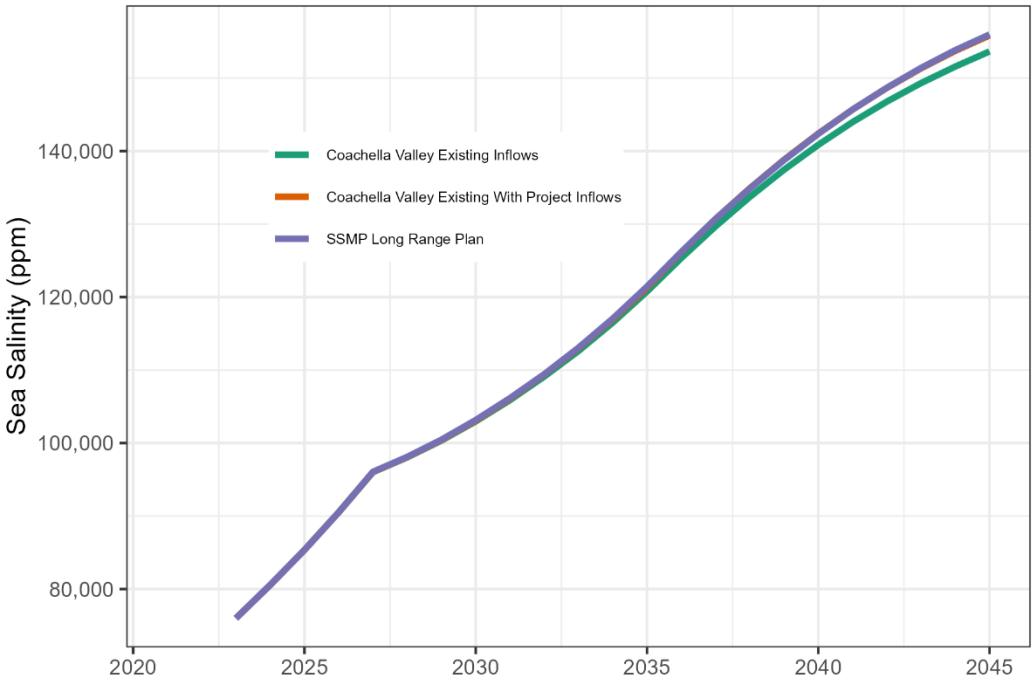

Figure 4
Modeled estimates of Salton Sea salinity (ppm).

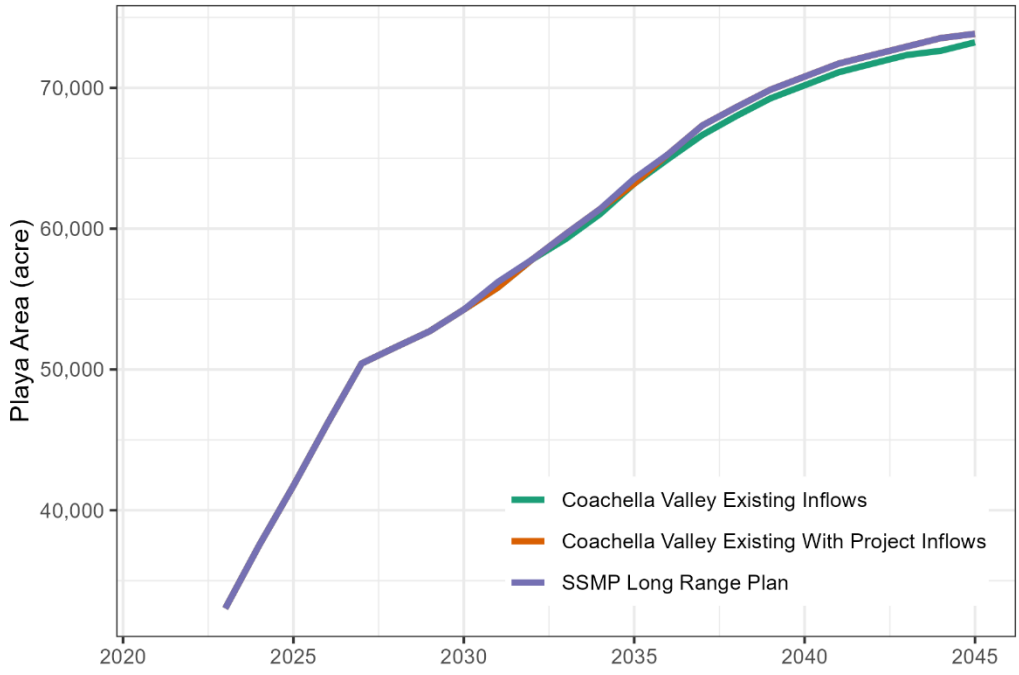

Figure 5
Modeled estimates of Salton Sea playa area (acres).

TABLE 4
TIME SERIES OF SSAM MODEL ESTIMATES OF SALTON SEA INFLOWS, ELEVATION, SALINITY, AND PLAYA AREA FOR THE COACHELLA VALLEY EXISTING INFLOW SCENARIO

Year	Estimates of Cumulative Inflow to Salton Sea Holding Existing Coachella Valley Inflows Constant (AF)	Elevation (ft. NAVD88)	Salinity (PPM)	Playa Area (Acres)
2023	935,580	-238.5	76,000.0	33,030
2024	924,475	-239.7	80,555.8	37,537
2025	909,267	-240.8	85,354.9	41,745
2026	894,059	-241.9	90,512.6	46,170
2027	1,018,101	-242.9	96,023.7	50,426
2028	1,002,893	-243.2	98,038.9	51,585
2029	987,685	-243.5	100,344.7	52,721
2030	972,478	-243.9	102,968.1	54,255
2031	957,270	-244.3	105,882.4	55,822
2032	942,062	-244.8	109,108.9	57,802
2033	926,854	-245.2	112,612.6	59,283
2034	911,646	-245.7	116,498.3	61,041
2035	896,438	-246.3	120,754.8	63,197
2036	896,438	-246.8	125,340.5	64,958
2037	896,438	-247.3	129,678.2	66,657
2038	896,438	-247.7	133,708.5	68,008
2039	896,438	-248.1	137,441.8	69,259
2040	896,438	-248.4	140,850.4	70,184
2041	896,438	-248.7	143,969.7	71,110
2042	896,438	-248.9	146,771.5	71,727
2043	896,438	-249.1	149,311.4	72,337
2044	896,438	-249.2	151,579.7	72,637
2045	896,438	-249.4	153,649.0	73,239

TABLE 5
TIME SERIES OF SSAM MODEL ESTIMATES OF SALTON SEA INFLOWS, ELEVATION, SALINITY, AND PLAYA AREA FOR THE COACHELLA VALLEY EXISTING INFLOW WITH PROJECT SCENARIO

Year	Estimates of Cumulative Inflow to Salton Sea Including Phased Reductions with Project (AF)	Elevation (ft. NAVD88)	Salinity (PPM)	Playa Area (Acres)
2023	935,580	-238.45	76,000.0	33,030
2024	924,475	-239.7	80,555.8	37,537
2025	909,267	-240.8	85,354.9	41,745
2026	894,059	-241.9	90,512.6	46,170
2027	1,016,981	-242.9	96,023.7	50,426
2028	1,001,773	-243.2	98,069.0	51,585
2029	986,565	-243.5	100,406.7	52,721
2030	969,678	-243.9	103,064.4	54,255
2031	954,470	-244.3	106,067.4	55,822
2032	939,262	-244.8	109,390.3	57,802
2033	924,054	-245.3	112,998.8	59,637
2034	908,846	-245.8	116,940.9	61,399
2035	890,053	-246.3	121,258.6	63,197
2036	890,053	-246.9	126,128.8	65,299
2037	890,053	-247.5	130,701.0	67,334
2038	890,053	-247.9	134,901.4	68,636
2039	890,053	-248.3	138,813.6	69,876
2040	890,053	-248.6	142,397.8	70,801
2041	890,053	-248.9	145,684.4	71,727
2042	890,053	-249.1	148,641.7	72,337
2043	890,053	-249.3	151,326.5	72,938
2044	890,053	-249.5	153,727.1	73,540
2045	890,053	-249.6	155,836.6	73,841

TABLE 6
TIME SERIES OF SSAM MODEL ESTIMATES OF SALTON SEA INFLOWS, ELEVATION, SALINITY, AND PLAYA AREA FOR THE LRP HIGH PROBABILITY INFLOW SCENARIO

Year	LRP High Probability Inflow (AF)	LRP High Probability Elevation (ft. NAVD88)	LRP High Probability Salinity (PPM)	LRP High Probability Playa Area (Acres)
2023	935,580	-238.45	76,000.0	33,030
2024	924,475	-239.7	80,555.8	37,537
2025	908,829	-240.8	85,354.9	41,745
2026	893,184	-241.9	90,522.7	46,170
2027	1,016,789	-242.9	96,057.4	50,426
2028	1,001,143	-243.2	98,108.5	51,585
2029	985,498	-243.5	100,464.6	52,721
2030	969,853	-243.9	103,155.1	54,255
2031	954,207	-244.4	106,155.3	56,215
2032	938,562	-244.8	109,431.1	57,802
2033	922,917	-245.3	113,065.1	59,637
2034	907,271	-245.8	117,051.1	61,399
2035	891,626	-246.4	121,434.4	63,555
2036	891,188	-246.9	126,176.7	65,299
2037	890,751	-247.5	130,699.0	67,334
2038	890,313	-247.9	134,866.2	68,636
2039	889,876	-248.3	138,765.4	69,876
2040	889,438	-248.6	142,359.6	70,801
2041	889,438	-248.9	145,680.6	71,727
2042	889,438	-249.1	148,672.9	72,337
2043	889,438	-249.3	151,392.3	72,938
2044	889,438	-249.5	153,826.6	73,540
2045	889,438	-249.6	155,968.4	73,841

TABLE 7
SSAM RESULTS FOR YEAR 2045 EXISTING CONDITIONS AND EXISTING CONDITIONS WITH PHASED WRP-4 PROJECT

Scenario	Inflow (AFY)	Elevation (ft. NAVD88)	Salinity (PPM)	Playa Area (Acre)
Coachella Valley Existing Inflows	896,438	-249.4	153,649.0	73,239
Coachella Valley Existing Inflows with WRP 4 Project	890,053	-249.6	155,836.6	73,841
Difference	-6,385	-0.2	2,188	602

TABLE 8
SSAM RESULTS FOR YEAR 2045 EXISTING CONDITIONS AND THE SSMP LONG RANGE PLAN

Scenario	Inflow (AFY)	Elevation (ft. NAVD88)	Salinity (PPM)	Playa Area (Acre)
Coachella Valley Existing Inflows with WRP 4 Project	890,053	-249.6	155,836.6	73,841
LRP High Probability	889,438	-249.6	155,968.4	73,841
Difference	615	0	-132	0

TABLE 9
COMPARISON OF COACHELLA VALLEY EXISTING INFLOWS WITH AND WITHOUT WRP 4 PROJECT AT EACH PHASE IMPLEMENTATION DATE

	Inflow (AFY)	Elevation (ft. NAVD88)	Salinity (PPM)	Playa Area (Acre)
Phase 1 (2028)				
Coachella Valley Inflow Existing Condition	1,002,893	-243.2	98,038.9	51,585
Coachella Valley Inflow Existing Conditions with WRP 4 Project	1,001,773	-243.2	98,069.0	51,585
Difference	-1,120	0	30	0
Phase 2 (2031)				
Coachella Valley Inflow Existing Condition	957,270	-244.3	105,882.4	55,822
Coachella Valley Inflow Existing Conditions with WRP 4 Project	954,470	-244.3	106,067.4	55,822
Difference	-2,800	0	185	0
Phase 3 (2036)				
Coachella Valley Inflow Existing Condition	896,438	-246.8	125,340.5	64,958
Coachella Valley Inflow Existing Conditions with WRP 4 Project	890,053	-246.9	126,128.8	65,299
Difference	-6,385	-0.1	788.3	341

Section 2: Proposed WRP 4 Project Compared with 2022 WMP Modeled Future Coachella Valley Inflow Conditions

Background

Indio Subbasin Water Management Plan (2022 WMP)

The Coachella Valley experienced significant groundwater declines due to decades of overdraft—pumping groundwater at rates exceeding natural replenishment. To address overdraft, regional water agencies, led by the Coachella Valley Water District (CVWD), developed water management plans with a range of strategies to manage groundwater. These on-going efforts include groundwater replenishment programs using imported water from the Colorado River (including exchanges for State Water Project allocations), conservation initiatives to reduce groundwater use, and promoting water recycling. The aim has been to balance groundwater use with replenishment rates, securing the long-term sustainability of the region's vital groundwater resources. The latest version of the water management plan, which also serves to comply with California's Sustainable Groundwater Management Act (SGMA), is the 2022 WMP.

SGMA requires California's groundwater basins to be managed sustainably to address overdraft and declining groundwater supplies. The Coachella Valley is actively complying with SGMA through collaborative efforts among local water agencies. The CVWD, Desert Water Agency (DWA), Coachella Water Authority (CWA), and Indio Water Authority (IWA) have each been designated as exclusive Groundwater Sustainability Agencies (GSAs) over their service areas within the Indio Subbasin. These agencies jointly submitted the 2010 Coachella Valley Water Management Plan Update as an Alternative to a Groundwater Sustainability Plan (GSP) for the Indio Subbasin. The California Department of Water Resources (DWR) approved this Alternative Plan in July 2019, affirming that it met SGMA's objectives. In compliance with SGMA's requirement for periodic updates, the GSAs collaboratively prepared the 2022 WMP, which was adopted by CVWD's Board of Directors following a public hearing on December 7, 2021, and submitted to DWR on December 29, 2021. DWR approved the 2022 WMP on June 27, 2024, confirming that groundwater management in the Indio Subbasin continue to meet SGMA's sustainability goals.

The primary goals of the 2022 WMP are to reliably meet present and future water demands and to implement effective and sustainable management of groundwater resources that complies with the objectives of SGMA. The 2022 WMP incorporated population growth projections from the Southern California Association of Governments (SCAG) based on the General Plans of the Cities and Counties within the Plan Area, anticipated land use and demographic changes, employment growth, and water conservation trends within the region to assess future water demands. This ensures that water resource planning aligns with expected growth patterns in the Plan Area. The 2022 WMP included impacts from climate change on the amount and reliability of local and imported surface water supplies. The 2022 WMP adopted a programmatic set of Projects and Management Actions (PMAs) selected to meet the projected increases in water demands, mitigate impacts from decreasing reliability of local and imported surface water supplies, and ensure sustainable and resilient groundwater resources for the Coachella Valley. The proposed project is the WRP-4 Tertiary Expansion & Delivery (PMA 18).

The ability of the 2022 WMP to meet the goals of SGMA was validated using the Indio Subbasin groundwater flow model, which was used to simulate management scenarios that included near-term projects (5-year) and longer-term projects (future projects, >5 years). The groundwater flow model was calibrated using groundwater level measurements throughout the Subbasin and subsurface drain flows calculated using the CVSC USGS gage and flow monitoring data collected by CVWD at each of the agricultural drains that flow directly to the Salton Sea. In addition to groundwater levels and storage, the groundwater flow model outputs projected future subsurface drain flows for each management scenario. **Figure 6** shows the modeled subsurface drain flows with the implementation of the Near Term Projects accounting for Climate Change scenario and the Future Projects accounting for Climate Change scenario .

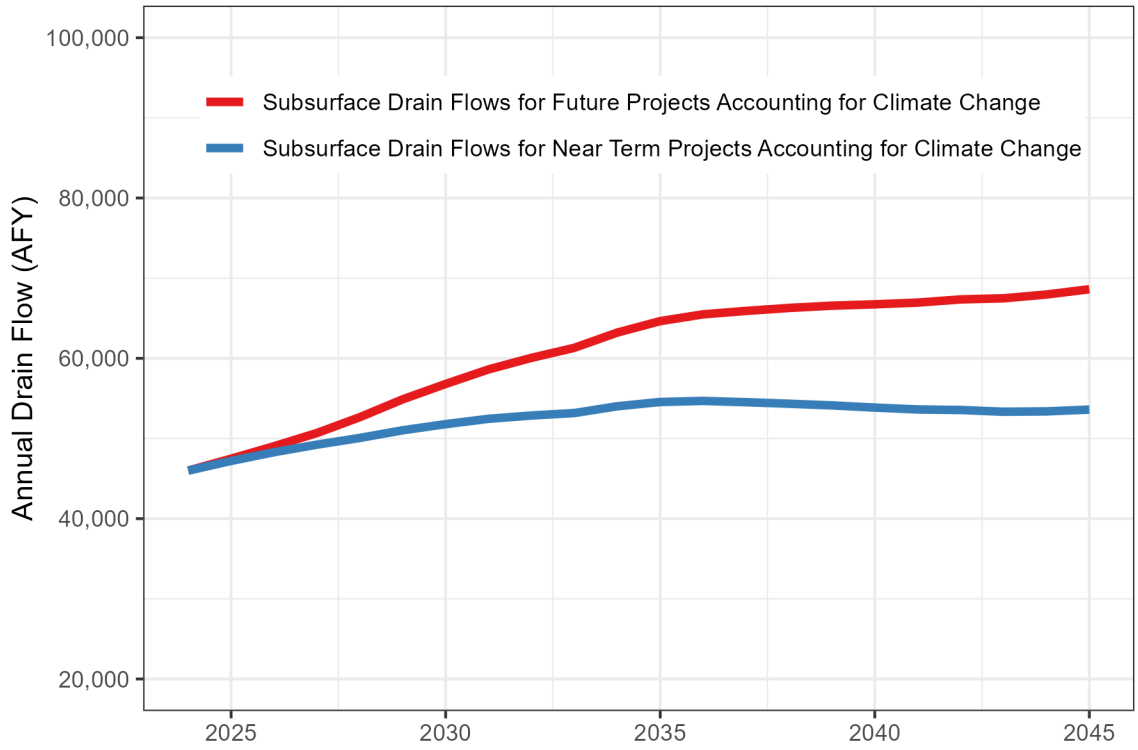

Figure 6
Model subsurface drain flow projections from Coachella Valley based on the 2022 WMP

Table 10 shows projects included as PMAs in the 2022 WMP that are being implemented in the current five-year Capital Improvement Plan (CIP), including the amount of annual pumping reduction or increase in replenishment from each project. The projects in Table 2 are located in or near the East Coachella Valley and have the greatest impact on the projected subsurface drain flows. The largest of these projects is the Oasis in Lieu Project (PMA 13), which will reduce groundwater pumping in the East Coachella Valley by up to 32,000 acre-feet per year (AFY); the Oasis in Lieu Project has been substantially completed and agricultural customers are being connected to the irrigation system. Failing to implement the PMAs in the 2022 WMP would result in groundwater overdraft, non-compliance under SGMA, and would also have the unintended consequence of reducing inflows to the Salton Sea from the Coachella Valley.

TABLE 10
PROJECTS FROM THE 2022 WMP BEING IMPLEMENTED IN THE CURRENT FIVE-YEAR CAPITAL IMPROVEMENT PLAN (CIP)

Project	Description	-Pumping Reduction or +Increased Replenishment (AFY)	Status
Oasis in Lieu Project (PMA #13)	Project will expand the Canal water delivery system to the Oasis Area to substitute groundwater production.	-32,000	Project has been substantially completed, and agricultural customers are being connected to the irrigation system.
Palm Desert Groundwater Replenishment Facility Phase 2 (PMA #20)	Project will expand direct replenishment of the groundwater at the existing Palm Desert Groundwater Replenishment Facility	+15,000	All permits have been received and design completed. Request for construction bids to be published in April 2025
East Golf Non-Potable Water Expansion (PMA #12)	Project will connect additional golf customers in the East Valley to the Coachella Canal to substitute groundwater production. Two additional connections planned between FY 2027 and FY 2028.	-2,044	Design anticipated to begin in 2026.

Source: Indio Subbasin GSAs 2021

Methods

To consider future cumulative inflows to the Salton Sea from the Coachella Valley, a comparison has been conducted of future conditions with and without the proposed project assuming implementation of the management scenarios of the 2022 WMP: Near Term Projects with Climate Change and Future Projects with Climate Change. These future management scenarios are defined in **Table 11**.

TABLE 11
DRAIN FLOW SCENARIOS FROM THE 2022 WMP ADOPTED FOR USE IN THIS SSAM ANALYSIS

Scenario	Description
Near Term Projects with Climate Change (2022 WMP Near Term Projects)	The Near Term Projects with Climate Change scenario included supplies and facilities in place at the time of the 2022 WMP to support Indio Subbasin management, along with new projects planned to be completed by the GSAs within a 5-year horizon. This scenario included assumptions for climate change impacts on imported water and local water supplies. The WRP-4 Project was not implemented in the Near Term Projects scenario.
Future Projects with Climate Change (2022 WMP Future Projects)	The Future Projects with Climate Change scenario included supplies and facilities in place at the time of the 2022 WMP to support Indio Subbasin management, along with all projects and supplies that are planned by the GSAs within the 25-year planning horizon. This scenario included assumptions for climate change impacts on imported water and local water supplies. The 2022 WMP included implementation of all phases of WRP-4 Project (PMA 18).

Source: Indio Subbasin GSAs 2021

The SSAM was used to evaluate future cumulative inflow projections to the Salton Sea from the Coachella Valley based on modeled drain flows from the WMP (Table 11) combined with observed CVSV flows following the steps below:

1. Modeled subsurface drain flow data through 2045 derived from the 2022 WMP for the Near Term Projects with Climate Change scenario and Future Projects with Climate Change scenario. These modeled subsurface drain flow volumes increase over time based on the groundwater management actions described in the 2022 WMP.
2. CVSC surface flow data were taken from Table 7-3 of the Indio Subbasin SGMA Annual Reports for Water Years 2021 through 2023 (Indio Subbasin GSAs 2022, Indio Subbasin GSAs 2023, Indio Subbasin GSAs 2024). Flows reported in water years 2021 to present are based on CVWD's improved gaging locations and methods, and reflect the best available information on drain flow to the Salton Sea from the Coachella Valley.
3. The three year mean for the following measured surface discharge components was calculated: Valley Sanitary District (VSD), Coachella Water Authority (CWA), Kent SeaTech, and storm water (**Table 12**). The reported values for Valley Sanitary District and Coachella Water Authority in water year 2022 were incorrectly reported, so the average of water years 2021 and 2023 were used for that water year (Table 12).
4. Regulatory water is water discharged to the drains that is required by hydrodynamics of the gravity fed irrigation system for delivery of irrigation water to the most distant points in the system. The water year 2023 value was carried forward as the value for the reasonably foreseeable future (Table 12).
5. Items 3 and 4 combine to yield a value of 22,311 AFY (Table 12) and this flow volume remains fixed from 2024 through 2045 in the model. Potential increased flows from VSD and CWA treated wastewater discharges from projected population growth in their service areas are not considered to avoid speculation on future flows or timing from these sources.
6. WRP 4 discharge volumes are reduced according to the phases of the WRP-4 Project according to the schedule presented in Table 3 in Section 1 above. Phase 1 would reduce the discharge to the CVSC by 1 MGD (1,120 AFY) by 2027; Phase 2 would reduce the discharge to the CVSC by 2.5 MGD (2,800 AFY) by 2030; and Phase 3 would reduce the discharge to the CVSC by 5.7 MGD (6,385 AFY) by 2045.

TABLE 12
INFLOW COMPONENTS OTHER THAN WRP-4 AND SUBSURFACE DRAIN FLOWS USED IN THIS SSAM ANALYSIS

CVSC Flow Component	2021 Annual Discharge (AFY)	2022 Annual Discharge (AFY)	2023 Annual Discharge (AFY)	3-Year Average (AFY)
Valley Sanitary District	6,911	6,826[1]	6,741	6,826
Coachella Water Authority	3,017	2,941[1]	2,865	2,941
Kent SeaTech	6,086	6,432	6,484	6,334
Stormwater Flow	227	42	3,502	1,257
Regulatory Water	NA	NA	4,953[2]	4,953
Total				**22,311**

Source: Indio Subbasin Annual Reports for Water Years 2021-2022, 2022-2023. http://www.indiosubbasinsgma.org

Notes:

1. Water Year 2022 flow data for Valley Sanitary District and Coachella Water Authority were incorrectly reported, hence the mean of 2021 and 2023 was substituted.
2. The water Year 2023 value for regulatory water was carried forward as the value for the reasonably foreseeable future.

The SSAM analysis compared Salton Sea inflow estimates for three reasonably foreseeable future scenarios:

1. 2022 WMP Near Term Projects Accounting for Climate Change, excluding Phased WRP 4 Project
2. 2022 WMP Near Term Projects Accounting for Climate Change with Phased WRP-4 Project reductions of discharge from 5.7 MGD to 0 MGD.
3. 2022 WMP Future Projects Accounting for Climate Change which, by design in the WMP, included implementation of phased reduction of WRP-4 discharge from 5.7 MGD to 0 MGD.

Table 13 provides the modeled future Coachella Valley inflows based on the 2022 WMP projections through 2045 for each scenario. The LRP High Probability Coachella Valley inflows from the are also included in Table 13 and plots of WMP SSAM results below.

Inflow to the Salton Sea for sources other than Coachella Valley contributions were kept the same as those reported in Appendix A of the LRP, except for the addition of 2023 actual inflow data, and the inclusion of the proposed reduction of Imperial Irrigation District (IID) inflows for 2023 through 2026 that are part of the 2024 - 2026 Temporary Colorado River System Water Conservation Project (UBOR 2024). The IID inflow reductions are proposed maximum volumes that may occur within the next three years. They are assumed in this analysis to provide a conservative view of potential cumulative flow reductions.

TABLE 13
COACHELLA VALLEY INFLOWS TO THE SALTON SEA USED IN THE SSAM SCENARIOS

Year	2022 WMP Near Term Projects Accounting for Climate Change (AFY)	2022 WMP Near Term Projects Accounting for Climate Change with Phased WRP-4 Project (AFY)	2022 WMP Future Projects Accounting for Climate Change (AFY)	LRP High Probability from the Coachella Valley
2024	74,687	74,687	74,687	77,000
2025	75,898	75,898	76,173	76,563
2026	76,988	76,988	77,730	76,125
2027	77,927	76,807	78,258	75,688
2028	78,767	77,647	80,236	75,250
2029	79,722	78,602	82,465	74,813
2030	80,487	77,687	82,699	74,375
2031	81,155	78,355	84,513	73,938
2032	81,561	78,761	85,956	73,500
2033	81,871	79,071	87,211	73,063
2034	82,716	79,916	89,109	72,625
2035	83,252	76,867	86,955	72,188
2036	83,383	76,998	87,799	71,750
2037	83,224	76,839	88,227	71,313
2038	83,034	76,649	88,595	70,875
2039	82,824	76,439	88,879	70,438
2040	82,552	76,167	89,051	70,000
2041	82,320	75,935	89,264	70,000
2042	82,250	75,865	89,661	70,000
2043	82,036	75,651	89,801	70,000
2044	82,079	75,694	90,272	70,000
2045	82,301	75,916	90,930	70,000

Results and Conclusions

The SSAM was used to estimate future conditions of Salton Sea inflow, elevation, salinity, and acreage of exposed lakebed under three reasonably foreseeable future inflow conditions from the Coachella Valley resulting from the implementation of the 2022 WMP. The implementation of the PMAs in the 2022 WMP, particularly those with the greatest influence on East Coachella Valley groundwater levels, are expected to increase total inflows from the Coachella Valley to the Salton Sea.

Summary plots for three reasonably foreseeable future scenarios are presented below for Salton Sea Inflows (**Figure 7**), Salton Sea elevation (**Figure 8**), Salton Sea salinity (**Figure 9**) and Salton Sea playa area (**Figure 10**). Comparative summaries are presented in **Table 13.** Tabular presentations of the results for all model years follow in **Table 14, Table 15,** and **Table 16**. Tabular results for the LRP High Probability Coachella Valley inflow scenario are presented in Table 6, above in Section 1.

The proposed WRP-4 Project would reduce inflows from the Coachella Valley to the Salton Sea by approximately 5.7 MGD (6,385 AFY) or 0.58 percent of the current total average annual inflows to the Salton Sea of 1,090,000 AFY (DWR and CDFW 2022).

Both the 2022 WMP Near Term Projects and 2022 WMP Near Term Projects with Phased WRP-4 Project scenarios result in higher inflows to the Salton Sea from the Coachella Valley than existing flows (Figure 6). This results in more favorable conditions with respect to Salton Sea elevation, salinity, and acreage of exposed lakebed. The 2022 WMP Future Projects scenario results in the highest inflows to the Salton Sea with the full implementation of the 2022 WMP PMAs, including the WRP 4 Project.

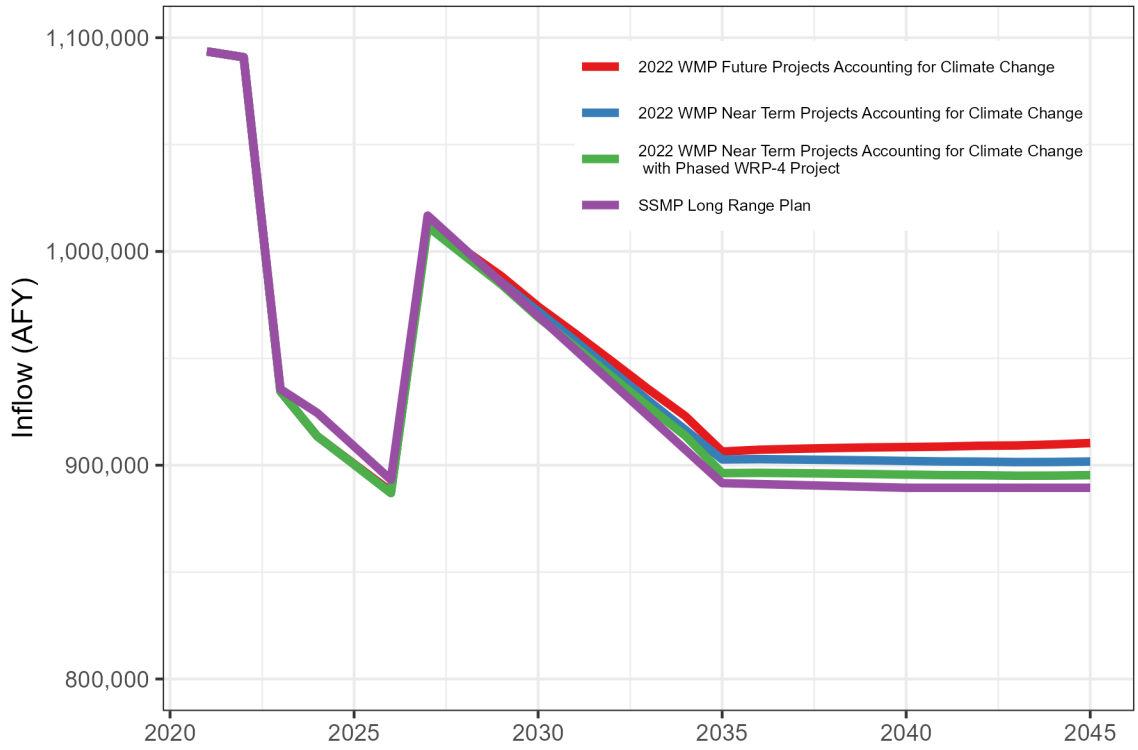

Figure 7
Modeled estimates of total Salton Sea inflow (AFY)

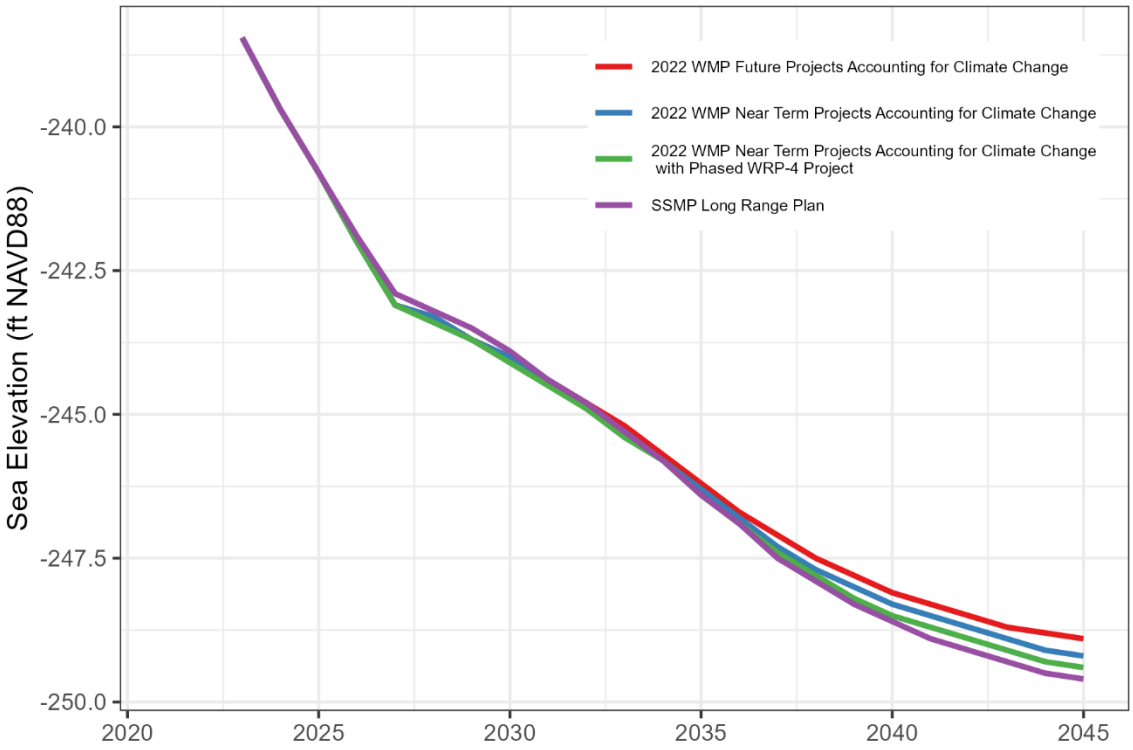

Figure 8
Modeled estimates of Salton Sea elevation (NAVD88 feet)

Figure 9
Modeled estimates of Salton Sea salinity (ppm)

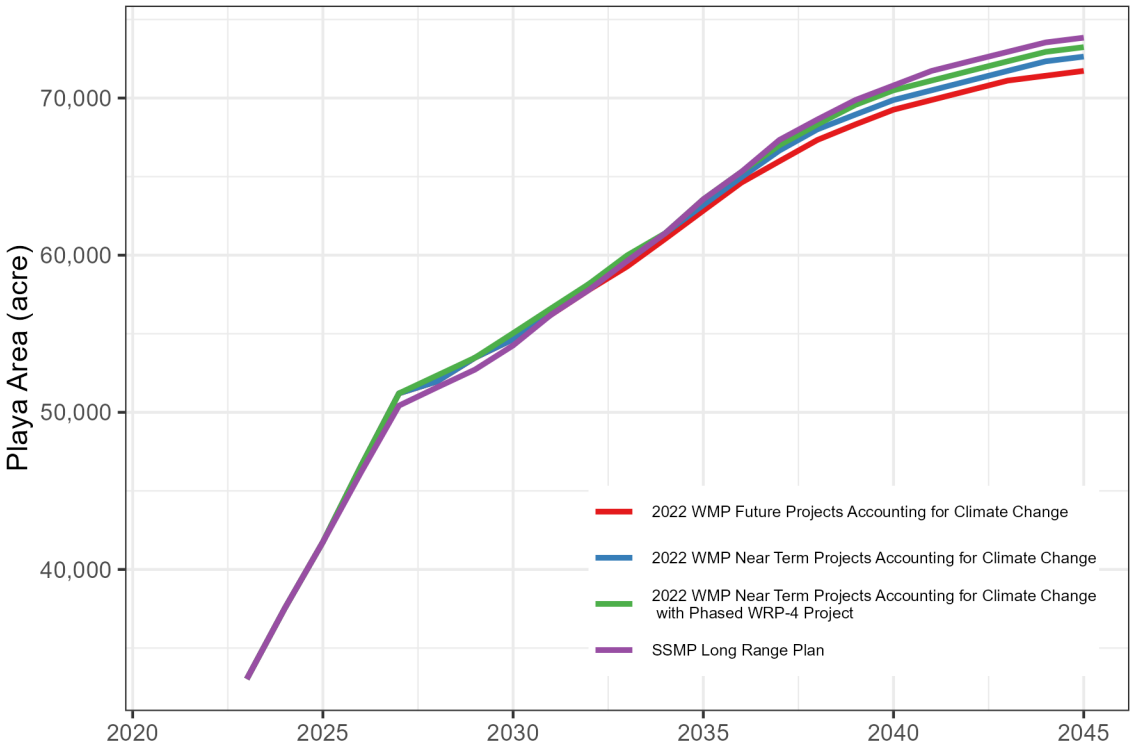

Figure 10
Modeled estimates of Salton Sea playa area (acres)

TABLE 13
SSAM RESULTS FOR YEAR 2045 FOR EACH SCENARIO

Scenario	Inflow (AFY)	Elevation (ft. NAVD88)	Salinity (PPM)	Playa Area (Acre)
2022 WMP Near Term Projects	901,739	-249.2	151,867.0	72,637
2022 WMP Near Term Projects with Phased WRP-4 Project	895,354	-249.4	154,047.0	73,239
2022 WMP Future Projects (including Phased WRP-4 Project)	910,368	-248.9	149,569.2	71,727

TABLE 14
TIME SERIES OF SSAM MODEL ESTIMATES OF SALTON SEA INFLOWS, ELEVATION, SALINITY, AND PLAYA AREA FOR THE 2022 WMP NEAR TERM PROJECTS ACCOUNTING FOR CLIMATE CHANGE WITHOUT PHASED WRP-4 PROJECT

Year	With Project Inflow (AF)	With Project Elevation (ft. NAVD88)	With Project Salinity (PPM)	With Project Playa Area (Acres)
2023	934,580	-238.5	76,000.0	33,030

Year	With Project Inflow (AF)	With Project Elevation (ft. NAVD88)	With Project Salinity (PPM)	With Project Playa Area (Acres)
2024	913,545	-239.7	80,574.3	37,537
2025	900,331	-240.8	85,601.9	41,745
2026	886,997	-242.0	90,993.1	46,581
2027	1,012,762	-243.1	96,687.9	51,207
2028	999,177	-243.3	98,761.5	51,964
2029	985,707	-243.7	101,137.8	53,479
2030	972,048	-244.0	103,735.9	54,645
2031	958,291	-244.4	106,628.5	56,215
2032	944,273	-244.9	109,784.4	58,181
2033	930,159	-245.3	113,172.3	59,637
2034	916,579	-245.8	116,896.1	61,399
2035	902,691	-246.3	120,910.4	63,197
2036	902,822	-246.8	125,241.1	64,958
2037	902,662	-247.3	129,295.4	66,657
2038	902,472	-247.7	133,033.3	68,008
2039	902,262	-248.0	136,474.2	68,950
2040	901,991	-248.3	139,667.4	69,876
2041	901,758	-248.5	142,589.9	70,493
2042	901,689	-248.7	145,288.5	71,110
2043	901,474	-248.9	147,738.4	71,727
2044	901,517	-249.1	149,937.3	72,337
2045	901,739	-249.2	151,867.0	72,637

TABLE 15
TIME SERIES OF SSAM MODEL ESTIMATES OF SALTON SEA INFLOWS, ELEVATION, SALINITY, AND PLAY AREA FOR THE 2022 WMP NEAR TERM PROJECTS ACCOUNTING FOR CLIMATE CHANGE WITH PHASED WRP-4 PROJECT

Year	With Project Inflow (AF)	With Project Elevation (ft. NAVD88)	With Project Salinity (PPM)	With Project Playa Area (Acres)
2023	934,580	-238.5	76,000.0	33,030
2024	913,545	-239.7	80,574.3	37,537
2025	900,331	-240.8	85,601.9	41,745
2026	886,997	-242.0	90,993.1	46,581
2027	1,011,641	-243.1	96,687.9	51,207
2028	998,057	-243.4	98,792.0	52,342
2029	984,587	-243.7	101,151.5	53,479
2030	969,247	-244.1	103,783.2	55,037
2031	955,491	-244.5	106,708.6	56,615
2032	941,473	-244.9	109,899.0	58,181
2033	927,358	-245.4	113,387.1	59,990
2034	913,778	-245.8	117,161.4	61,399
2035	896,306	-246.4	121,293.0	63,555
2036	896,437	-246.9	125,834.3	65,299
2037	896,277	-247.4	130,114.8	66,995
2038	896,087	-247.8	134,086.5	68,322
2039	895,877	-248.2	137,768.7	69,567
2040	895,606	-248.5	141,133.1	70,493
2041	895,373	-248.7	144,219.4	71,110
2042	895,304	-248.9	147,073.0	71,727
2043	895,089	-249.1	149,666.4	72,337
2044	895,132	-249.3	151,997.7	72,938
2045	895,354	-249.4	154,047.0	73,239

TABLE 16
TIME SERIES OF SSAM MODEL ESTIMATES OF SALTON SEA INFLOWS, ELEVATION, SALINITY, AND PLAY AREA FOR THE 2022 WMP FUTURE PROJECTS ACCOUNTING FOR CLIMATE CHANGE, INCLUDING THE PHASED WRP-4 PROJECT

Year	With Project Inflow (AF)	With Project Elevation (ft. NAVD88)	With Project Salinity (PPM)	With Project Playa Area (Acres)
2023	934,580	-238.5	76,000.0	33,030
2024	913,547	-239.7	80,574.3	37,537
2025	900,607	-240.8	85,601.9	41,745
2026	887,739	-242.0	90,986.6	46,581
2027	1,013,093	-243.1	96,661.3	51,207
2028	1,000,646	-243.3	98,725.4	51,964
2029	988,450	-243.7	101,059.3	53,479
2030	974,260	-244.0	103,574.5	54,645
2031	961,650	-244.4	106,394.4	56,215
2032	948,668	-244.8	109,434.6	57,802
2033	935,499	-245.2	112,721.1	59,283
2034	922,972	-245.7	116,296.0	61,041
2035	906,394	-246.2	120,108.9	62,836
2036	907,237	-246.7	124,331.5	64,616
2037	907,665	-247.1	128,244.8	65,980
2038	908,034	-247.5	131,884.8	67,334
2039	908,317	-247.8	135,206.5	68,322
2040	908,489	-248.1	138,251.6	69,259
2041	908,702	-248.3	141,008.0	69,876
2042	909,100	-248.5	143,525.2	70,493
2043	909,239	-248.7	145,779.4	71,110
2044	909,710	-248.8	147,776.5	71,419
2045	910,368	-248.9	149,569.2	71,727

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