Chapter 5b: Salton Sea

Background

The Salton Sea is California's largest lake at approximately 25 miles long and up to 15 miles wide. The largest portion of the Salton Sea is in Imperial County while the northern portion is in the Eastern Coachella Valley (ECV) in Riverside County. In recent geologic history, lakes were formed on numerous occasions due to flooding of the Colorado River that filled this natural trough or sink, which is below sea level. The modern-day Salton Sea was formed in 1905 when the Colorado River breached an irrigation inlet and flowed unchecked into the area for 18 months. In the years after the breach, the Salton Sea has been fed largely by small rivers, creeks and drains that include agricultural runoff. The relatively shallow lake has no outlet and inflow does not keep pace with evaporation, causing the Salton Sea to gradually shrink. Salts are left behind when the water evaporates, leading to increasing salinity. The Salton Sea is currently over 50 percent saltier than the Pacific Ocean.

In 2003, multiple parties, including the State and three water districts in the region, entered into a series of agreements to address longstanding issues regarding usage of Colorado River water. These agreements are known collectively as the Quantification Settlement Agreement (QSA). The QSA includes an agreement to transfer water that was historically used to irrigate farm fields near the Sea to other Southern California water districts for residential use. To accommodate the QSA transfer, the Imperial Irrigation District (IID) has reduced its water use by increasing efficiencies and fallowing some fields. By reducing the amount of water available for agricultural uses in the Imperial Valley, these transfers have the effect of decreasing the amount of fresh water that runs off fields into the Sea. The State had required some mitigation inflow water to continue to be provided to the Salton Sea, but that requirement expired in December 2017. This has expedited the rate at which the Sea shrinks and becomes more saline. The Salton Sea is one of the most important links on the Pacific Flyway, supporting over 400 species of birds and a myriad of invertebrates, although deteriorating conditions may be detrimental to this habitat. As the Salton Sea continues to recede, an average of 4,800 acres of shoreline playa is estimated to be newly exposed each year. The increasing area of exposed playa is expected to increase windblown particulate matter and related health impacts.

Created in 1993, the Salton Sea Authority is a Joint Powers Authority (JPA) responsible for working in consultation and cooperation with the State of California to oversee the comprehensive restoration of the Salton Sea. Although the Salton Sea Authority and its partner agencies recognize the state and federal roles and responsibilities at the Salton Sea, the Salton Sea Authority is directed by board-adopted policy

to assert a leadership role to ensure local priorities are recognized. The State has committed to mitigating the effects of the water transfers through a cooperative effort between State and federal agencies and IID to implement habitat and dust suppression projects. The California Natural Resources Agency (CNRA) Salton Sea Management Program (SSMP) was created to address the urgent public and ecological health issues resulting from the drying and shrinking of the Salton Sea. While the SSMP is a long-range program, its immediate focus is on the development and implementation of the 2018 SSMP Phase I: 10-Year Plan[1], by providing planning, engineering, and environmental expertise for design and implementation of dust-suppression and habitat projects. The Phase I Plan includes projects that will be completed as early as the end of 2022.

Community Concerns

CSC members expressed that dust emissions resulting from the receding Salton Sea is a major concern in the ECV community. As the Salton Sea evaporates, its receding shoreline exposes sediments deposited at the bottom of the Sea, also referred to as "playa." The loose soil is blown off by strong gusty winds, contributing to PM10 (inhalable particulate matter) emissions that could impact air quality. Projections suggest that windblown PM10 exposure from the playa is expected to increase over time in an area already impacted by high PM10 events from strong winds through the San Gorgonio Pass that blow along the Coachella Valley or from summertime thunderstorm outflows that transport dust from the desert areas to the south and east into the Coachella Valley. While the composition of the playa is variable, current data suggests that the soils are high in salt content and may contain constituents that could be toxic. CSC members expressed concerns that the playa may also contain components from agricultural runoff, possibly including remnants of fertilizers and pesticides. Previous studies have detected selenium, cadmium and nickel, which could pose a risk to human health, in sufficient amounts. CSC members have mentioned that they would like IID and the State of California to move more quickly to develop and implement dust suppression projects for the exposed Salton Sea playa, as well as increase air monitoring around the Salton Sea, particularly in the northern region.

Elevated levels of hydrogen sulfide (H2S) occur from natural processes in the Salton Sea. While H2S, a gas that smells like rotten eggs, does not have a federal standard, there is a California State standard (30 parts-per-billion) that is exceeded numerous times each year near the shores of the Salton Sea. A few times each year, H2S odors are transported toward the northwest to inland areas of the Coachella Valley farther from the Salton Sea and, more rarely, through the San Gorgonio Pass into metropolitan Riverside and San Bernardino Counties. H2S odor events occur most frequently in the hot summer months but can occur whenever local breezes bring H2S from the Salton Sea into ECV communities. At levels above the State standard, most individuals can smell the odor and some may experience temporary symptoms such as headaches and nausea. Some individuals can smell H2S at very low concentrations, down to a few parts-per-billion. The long-term levels of H2S are unlikely to be above chronic Reference Exposure Levels, and therefore below thresholds where toxic impacts would be a concern. However, because odors can cause temporary health effects, and since H2S odors occur frequently in some areas of the ECV, this can lead to negative quality of life impacts. However, the symptoms associated with this level of exposure are temporary and are not expected to cause any long-term health effects. CSC members have expressed that

[1] https://resources.ca.gov/CNRALegacyFiles/wp-content/uploads/2018/10/SSMP-Phase-1-10-Year-Plan.pdf

they experience acute health effects (e.g., headaches and nosebleeds) during both windblown dust and Salton Sea H2S odor events. Because there continue to be concerns around the unknown or unquantified health impacts of the Salton Sea emissions, this is an ongoing topic of research at several academic research institutions, including UC Riverside, Loma Linda University and others. The community members requested additional monitoring and improvements to notification systems to better understand emissions from the Salton Sea and reduce exposure in the community. Please see Appendix 5b for more details.

Actions to Address the Salton Sea

To address community concerns and reduce exposure from the Salton Sea in ECV, South Coast AQMD staff developed actions for the Community Emissions Reduction Plan (CERP). Tables 1, 2 and 3 below provide goals, actions, responsible entities, metrics, and a timeline to achieve the exposure reductions from the Salton Sea.

Table 1 - Goal: Expand monitoring networks and improve notification systems					
	Action	**Responsible Entity**	**Metric**	**Timeline**	
				Start	**Complete**
A	Expand the existing South Coast AQMD's hydrogen sulfide (H2S) monitoring network in ECV to: • Provide near real-time H2S data and inform community members about potential odors, including a notification system for when ambient levels exceed the State standard; continue H2S odor advisories for multi-day odor events when H2S levels are forecasted to exceed the state standard • Use the monitoring data to help assess the odor's origin, community impact and extent to which the odors may transport in the community and beyond	South Coast AQMD	• Monitors installed • Data collected through air monitoring • Updates provided to the CSC	2nd quarter, 2021	4th quarter, 2025
B	Identify opportunities to expand the South Coast AQMD's PM10 monitoring network in the ECV to: • Provide real-time PM10 and wind data and inform community members of PM10 levels in ECV, and if they exceed federal and/or State standards • Gain a better understanding of dust emissions and assess methods to distinguish between windblown dust from desert areas and playa dust emissions from the Salton Sea • Track the concentration trends of PM10 over time to help determine the effectiveness of emissions reduction measures as highlighted in the CERP	South Coast AQMD	• Monitors installed • Data collected through air monitoring • Updates provided to the CSC	4th quarter, 2021	4th quarter, 2025

C	Establish baseline air monitoring to: • Characterize the chemical composition of fugitive dust emissions from different sources to help distinguish between windblown dust from desert areas and playa dust emissions from the Salton Sea • Analyze existing chemical speciation data and work with the CSC and CARB to determine which chemical species should be sampled. For example, this may include certain metals (such as selenium) and sea spray indicators • Track the concentration trends of key indicator pollutants of Salton Sea emissions	South Coast AQMD	• Data collected through air monitoring • Updates provided to the CSC	1st quarter, 2021	4th quarter, 2025
D	Seek new opportunities to work with the CSC to create an air quality sensor network in the ECV community to: • Provide real-time PM10 data • Supplement the PM10 monitoring network in the ECV and cover a larger area in the community • Co-locate air quality sensors with a reference PM10 monitor at one of South Coast AQMD's air monitoring station to verify the sensors performance prior to deployment and implement a data calibration and correction protocol to enhance sensor PM10 data quality after deployment	South Coast AQMD	• Air quality sensors deployed • Data collected through air monitoring • Updates provided to the CSC	4th quarter, 2021	4th quarter, 2025
E	Pursue a collaborative partnership with UCR School of Medicine, provide support to the ongoing study on soil chemical and microbiome composition of the Salton Sea playa dust samples, and work with the project team to expand this study to include adult populations in the ECV.	South Coast AQMD, UCR School of Medicine	• Updates provided to the CSC • Develop strategies list, if appropriate	1st quarter, 2021	4th quarter, 2025

Table 2 - Goal: Reduce emissions from the Salton Sea					
	Action	**Responsible Entity**	**Metric**	**Timeline**	
				Start	**Complete**
A	Provide additional air quality expertise to: • The State for the implementation of the Salton Sea Management Program • Land use agencies for new development projects near the Salton Sea	South Coast AQMD	• Updates provided to the CSC	1st quarter, 2021	1st quarter, 2026
B	Work with other agencies (e.g., IID and the State of California) to collect emissivity and dust emissions data to improve South Coast AQMD's emissions inventory	South Coast AQMD, IID, the State of California	• Data collected and incorporated in South Coast AQMD's emissions inventory • Updates provided to the CSC	4th quarter, 2021	4th quarter, 2026
C	Pursue a collaborative partnership and support IID, the Salton Sea Authority, Riverside County, Torres Martinez Desert Cahuilla Indians and the State of California with implementing dust suppression projects (e.g., Dust Suppression Action Plan (DSAP) and Salton Sea Management Plan) around the Salton Sea by: • Helping to identify locations in partnership with residents for future dust suppression projects (includes vegetation to reduce emissivity through the DSAP) in the ECV community; and • Providing letters of support for additional funding to help expedite dust suppression projects near population centers (e.g., North Shore) in the Riverside County portion of the Salton Sea	South Coast AQMD, IID, the State of California	• Number of projects worked on or supported • Updates provided to the CSC	1st quarter, 2021	1st quarter, 2026

	• Provide updates to the CSC on ongoing Salton Sea efforts (e.g., Coachella Valley Environmental Justice Task Force Meetings) in coordination with AB 617 implementation				
D	Pursue a collaborative partnership with IID, Regional Water Quality Control Board (RWQCB) Region 7 and State Water Regional Control Board (SWRCB) to identify opportunities to mitigate pesticide run-off into the Sea (e.g., developing alternative disposal options of agricultural runoff or water treatment facilities and filtration systems at all Salton Sea tributary entryways)	South Coast AQMD, IID	• Number of projects worked on or supported • Updates provided to the CSC	1st quarter, 2021	1st quarter, 2026
E	Pursue a collaborative partnership with Imperial County Air Pollution Control District (ICAPCD) to address cross-jurisdictional air pollution emissions from the Sea and dust suppression projects around the Salton Sea and gather air monitoring network data	South Coast AQMD, ICAPCD	• Number of projects worked on or supported • Updates provided to the CSC	1st quarter, 2022	1st quarter, 2026
F	Conduct outreach to facility operators/workers/owners on South Coast AQMD Rules 403 – Fugitive Dust and 403.1 – Supplemental Fugitive Dust Control Requirements for Coachella Valley Sources and best practices to reduce dust during the implementation of projects	South Coast AQMD	• Development of materials for distribution • Number of outreach events staff participates in the ECV • Number of entities the information is shared with (i.e., newsletter distribution list)	4th quarter, 2021	4th quarter, 2022

G	Pursue a collaborative partnership with community organizations to conduct outreach in the community (e.g., door hangers, handouts) to inform community members on how to file dust complaints • Develop a list of potential responses and solutions that South Coast AQMD staff can pursue in response to dust complaints	South Coast AQMD, community organizations	• Development of materials for distribution • Number of outreach events staff participates in the ECV • Number of entities the information is shared with (i.e., newsletter distribution list)	4th quarter, 2021	4th quarter, 2022

Table 3 - Goal: Reduce exposure from the Salton Sea

	Action	Responsible Entity	Metric	Timeline	
				Start	Complete
A	Identify, secure and utilize funding to install and maintain air filtration systems at schools and homes located near the Salton Sea to reduce exposure to dust emissions; assess the benefits and feasibility of filtered "clean rooms" in public buildings accessible to the community for relief from dust events	South Coast AQMD	• Number of air filtration systems installed	3rd quarter, 2021	3rd quarter, 2023
B	Identify, secure and utilize funding and pursue collaboration with appropriate entities (e.g., United States Green Building Council, Southern California Gas Company) to implement home weatherization projects near the Salton Sea	South Coast AQMD	• Number of weatherization projects implemented	4th quarter, 2021	4th quarter, 2024

C	Pursue a collaborative partnership with community organizations to conduct outreach in the community (e.g., door hangers, handouts, and community events) to inform community members, schools and other youth groups (e.g., Sierra Club Youth Group), on how to access real-time air quality data, subscribe to air quality alerts, report dust complaints, and use the South Coast AQMD app to obtain air quality information	South Coast AQMD, community organizations	• Development of materials for distribution • Number of outreach events staff participates in the ECV • Number of entities the information is shared with (i.e., newsletter distribution list)	4th quarter, 2021	4th quarter, 2022
D	Pursue a collaborative partnership with community organizations to conduct outreach in the community, including schools and other youth groups (e.g., Sierra Club Youth Group), to inform community members what to do when H2S levels are above the California Ambient Air Quality Standard (0.03 ppm)	South Coast AQMD	• Development of materials for distribution • Number of outreach events staff participates in the ECV • Number of entities the information is shared with (i.e., newsletter distribution list)	1st quarter, 2022	4th quarter, 2022
E	Work with local health care providers to provide requested air quality data (if available)	South Coast AQMD	• Data shared with healthcare providers	3rd quarter, 2021	1st quarter, 2026
F	Pursue a collaborative partnership with Riverside County, the City of Indio and the City of Coachella to identify, secure and implement urban greening projects near sensitive receptors near the Salton Sea	South Coast AQMD,	• Number of implemented urban greening projects	4th quarter, 2021	1st quarter, 2026