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October 6, 2026

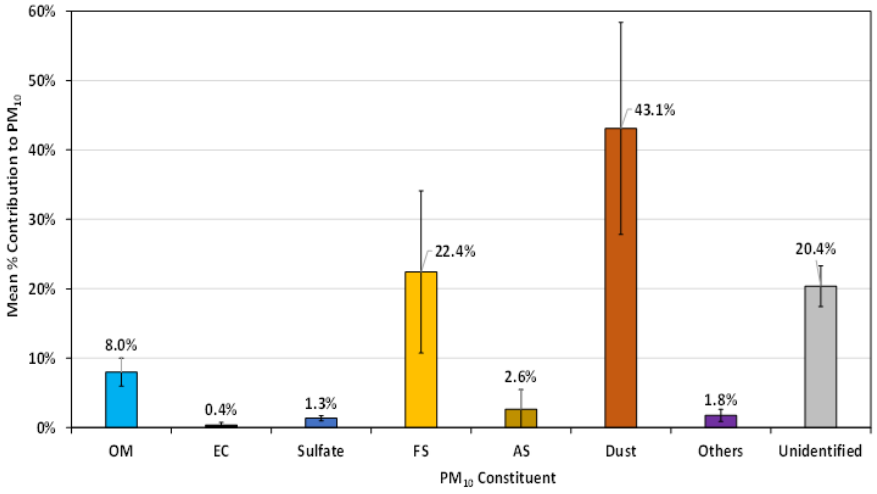
Via email: boardclerk@slocleanair.org

San Luis Obispo County
APCD Hearing Board
3433 Roberto Court
San Luis Obispo, CA 93401

Dear APCD Hearing Board,

Friends' was pleased to see that the PM10 monitoring at the waters edge via the Northern Foredune (meteorological and PM10 monitoring site) known as NFRA recorded the high PM10 concentrations coming from the Ocean.

However, we are disappointed by the quick distancing of the APCD, SAG and State Parks regarding looking into the Oceans contribution.



The graph above shows the high PM10 contributor of Fresh Sea-Salt (FS), which comes direct from the Ocean through high wind blowing sea-spray aerosols downwind.

If Sea-Salt can blow from the Ocean to the CDF, so can other elements in the Ocean. What has the APCD, SAG or State Parks done to verify the other particles coming from the Ocean? Absolutely Nothing!!!

Friends of Oceano Dunes is a 501(c)(3) California Not-for-Profit Public Benefit Corporation formed in 2001 to represent those who enjoy beach camping and Off-Road recreation primarily as well as others who enjoy the benefits of Public Access through Responsible Recreation at the Oceano Dunes State Vehicular Recreation Area (ODSVRA). We want to maintain Access For All!

In 2019, the SAG Compiled a report dated 2019-02-25 which states:

8.2 Additional Air Quality Monitoring

The SAG endorses the recommendation in the PMRP that additional field monitoring is essential for observing and assessing actual changes in PM_{10} emissions and PM_{10} concentrations resulting from dust control measures and for improving dust emission modelling. The SAG recommends additional sampling stations be installed within ODSRVA and downwind (to the east) to provide high quality data on key meteorological variables (wind speed, wind direction, temperature, relative humidity, barometric pressure, and precipitation) as well as PM_{10} concentrations. These stations would also improve the ability to evaluate changes in regional PM_{10} levels beyond the existing SLOAPCD network, and provide the opportunity to investigate other potential contributions to regional PM_{10} levels not related to ODSVRA, such as sea salt, marine microorganisms, or agricultural field operations.

8.3 Analysis of Other Potential PM Sources

The SAG believes that continued study of sea salt and microorganisms contained in sea spray as potential PM_{10} sources and mechanisms is merited. Such study could be included in broader air quality monitoring efforts, as described in SAG response Subsection 7.2 above. However, in no way should it delay action on deployment of the foredune construction plan.

The SAG previously supported studying the study of "sea salt and microorganisms contained in sea spray as potential PM10 sources and mechanisms **is merited**."… but sadly now the SAG appears to be back tracking.

A 2022 SAG memo date November 23, 2022 states:

Comments on Speciation Analysis

This report does a good job of clearly presenting the chemical speciation and source attribution analysis. The analyses are overall clear and well-reasoned. However, the present report is somewhat light on interpretation. Without situating these results within the larger debate regarding the attribution of airborne PM_{10} at monitoring sites near the ODSVRA, there is a danger that the results could be misinterpreted. Here, the SAG offers some ideas for consideration in the interpretation of these source attribution results.

The present study adds significant clarity to the ongoing debate about chemical speciation by identifying a clear approach to identification of chemical constituents within filter samples. Seven constituents are identified: (1) fresh sea salt (FS), (2) aged sea salt (AS), (3) non-sea salt sulfate ($nssSO_4^{2-}$), (4) mineral dust (MD), (5) elemental carbon (EC), (6) organic matter (OM), and (7) "other." Together, these seven constituents are summed together as "reconstructed mass." Any gap between this reconstructed mass and the total gravimetric mass is considered "unidentified mass."

The inclusion of laboratory ion analyses to determine the contribution of sea salt (both FS and AS) to total reconstructed mass provides a significant advancement over previous speciation studies at the ODSVRA. As shown in Fig. 7 of the present study, FS dominates the combined sea salt contribution on high PM_{10} days, suggesting an oceanic origin for this component of PM_{10}. As shown in Fig. 8, when such sea salt (both FS and AS) is included within the overall

In 2022, an email from Dr. Gillies titled **"resolving the sea salt source conundrum at ODSVRA"**, (see attachment A) stated the following (emphasis added):

> "We know from the 2021 speciation data that sea salt (fresh and aged) contributes approximately 22% to the PM10 mass on the observed exceedance days in 2021. The question that is unresolved is "what proportion of the sea salt came directly from the ocean on those days (via droplets evaporating creating particles of NaCl) or came from saltation-driven emissions releasing NaCl particles that were previously deposited to the sand"? The relative apportionment of direct-oceanic vs saltation-derived will provide **a basis for determining whether Parks has the basis for arguing for "subtracting" a sea salt component** when evaluating the "excess of PM10" beyond the pre-disturbance level on exceedance days when winds are clearly arriving at CDF from the direction of the Ocean."

2022 A memo titled: Chemical Speciation and Source Attribution of PM10 Samples Collected in 2021 at the CDF Monitoring Site stated the following:

> Figure 9 **shows that mineral dust and sea salt have high concentrations during the high PM10 days at the CDF monitoring station, representing major influences from the ocean and saltation driven dust emissions**, while OM is a minor contributor. Additionally, the concentrations of tracers for on-road traffic emissions (represented by EC) and regional pollution (represented by nssSO4 2-, nssNO3 - and NH4 + (included in Others category)) are low. The concentration of methyl methanesulfonate (CH3SO3-) was <1.2 μg m-3 for all sampling days. The PM10 mass percentages of chemical constituents in Figure 10 show that **while sea salt and mineral dust are the dominant PM10 constituents during high PM10 concentration days,** organics and nssSO4 2- contributions are higher during lower PM10 concentration days.

2023 this same group of individuals from different organizations collectively working together published a paper identifying that the process is well understood!

> **Fresh sea salt particles are generated through two main pathways: (1) bubble-bursting when air bubbles entrained by breaking waves rise to the surface and burst to create film and jet drops, and (2) spume drops when the wind shear is sufficiently high to tear water droplets off surface waves** [29]. The composition of fresh sea salt is usually considered similar to that of bulk seawater, and the compositions with the highest mass percentages are Cl (55.04%), Na (30.61%), SO4 2− (7.68%), Mg (3.69%), Ca (1.16%), and K (1.1%) [30]. Once in the air, the spray droplets are transported and dispersed by wind, and chemical reactions with other atmosphere constituents subsequently change their composition."
>
> Quantifying the Source Attribution of PM10 Measured Downwind of the Oceano Dunes State Vehicular Recreation Area
> Xiaoliang Wang 1 , John A. Gillies 1,* , Steven Kohl 1, Eden Furtak-Cole 1 , Karl A. Tupper 2 and David A. Cardiel

Friends has provided substantial scientific evidence in previous submittals showing:

- The Ocean today is not the same as the Ocean in the 1930s due to over 2,700 Million Gallons Per Day (MGD) being dumped in the Ocean in front of the Oceano Dunes.
    - Therefore, the model assumption that the Ocean is the same today as the 1930s is false!

- Scientific reports showing all forms of PM10, including mineral dust, can be transported from the Ocean in Sea Spray the same way as Salt

- Scientific reports showing upwards of 50% of PM10 measured inland is coming from the Ocean.

Comments on the Provisional Final 2026 ARWP:

The report stated: "The near-shore PM10 is likely composed of sea-spray particles and salt and organic particles following the evaporation of the liquid spray particles, **as well as some mineral particles…"**

Sadly, **with absolutely no evidence**, the report then states: "during saltation when the beach area is sufficiently dry and exposed to above threshold wind speed." In an effort to ignore any Sea Spray contribution of mineral dust. The beach in front of this monitor is rarely dry enough to allow saltation.

This claim directly ignores known scientific data that shows PM10 mineral dust (and other elements) in the Ocean can be blown into the air during a high wind sea-spray event similar to that of Sea Salt (NaCL) that has been recorded at the CDF monitoring station.

Then the report claims: "As these near-shore PM10 particles advect, disperse, and deposit downwind, their contribution to the total PM10 burden diminishes…" where is the evidence to support this claim. It is contrary to the high Salt monitored downwind at CDF and other reports from SAG (like the conundrum email).

Friends does not discount that there is an OHV Contribution. Friends has repeatedly asked for the following:

1. Show the documented proof of measured Pi-Swerl measurements and the correlation to downwind PM10.
    a. With the recent report showing a tractor towing a beach rake that reaches 8 inches into the ground and agitates the sand to remove trash had no measurable difference…how does a lightweight OHV have an impact?

2. Document the OHV Contribution to downwind PM10
    a. The Oceano Dunes should not be responsible for ALL particles, natural, oceanic (Sea Spray) and any other source other than the OHV Contribution.

3. Update the Pre-Disturbance model to correctly account for the increase in particulates in the Ocean due to over 2700 Million Gallons Per Day being dumped into the Ocean in

front of the Oceano Dunes.

4. Let's solve the conundrum and take samples of the Ocean and Sand to do speciation analysis to determine their compensation and how it relates to what is being measured downwind.

Friends has repeatedly asked to be a part of the discussion and is ignored!!

Friends of Oceano Dunes (Friends) was created in 2001 to preserve and promote recreational uses, including beach camping and off-highway vehicle recreation, at the Oceano Dunes State Vehicular Recreation Area (ODSVRA). ODSVRA attracts over 1.5 million annual visitors and contributes over $500M to the local economy.

Sincerely,



Jim Suty
President, Friends of Oceano Dunes

Cc: Friends BOD & Legal Counsel

Attachment A

From: Jack Gillies <Jack.Gillies@dri.edu>
Sent: Thursday, October 27, 2022 10:33 AM
To: Glick, Ronnie@Parks <Ronnie.Glick@parks.ca.gov>
Cc: O'Brien, Jon@Parks <Jon.OBrien@parks.ca.gov>
Subject: resolving the sea salt source conundrum at ODSVRA

Ronnie,
I was hoping to discuss our (Jack, Vic, and Xiaoling's) idea with you about resolving the sea salt contribution conundrum and determine if you would support the work required via the current contract, but was lead astray by red wine and delicious steak and mashed potatoes.
Here is the idea and then a brief explanation of the method proposed.
Idea: We know from the 2021 speciation data that sea salt (fresh and aged) contributes approximately 22% to the PM10 mass on the observed exceedance days in 2021. The question that is unresolved is "what proportion of the sea salt came directly from the ocean on those days (via droplets evaporating creating particles of NaCl) or came from saltation-driven emissions releasing NaCl particles that were previously deposited to the sand"? The relative apportionment of direct-oceanic vs saltation-derived will provide a basis for determining whether Parks has the basis for arguing for "subtracting" a sea salt component when evaluating the "excess of PM10" beyond the pre-disturbance level on exceedance days when winds are clearly arriving at CDF from the direction of the Ocean.
Method:
1) Collect bulk samples of sand along several west to east transects. Including riding and non-riding areas. Collect a gallon zip-loc bag of sand approx. every 100 m along a transect and note the GPS coordinates and site characteristics at each sample location (stoss, lee, elevation, lee of veg, etc.)
2) return samples to DRI Las Vegas
3) for each sample extract a sub-sample (e.g., 10 g), mix into distilled water (of known salinity) and measure salinity after adding (someone at DRI will have a high end salinity instrument). This will help in determining if there is a gradient of salinity as a function of distance from the shoreline.
4) composite samples from the same longitude (same distance from the shoreline) and place into a sample tray that accommodates the PI-SWERL (See Etyemezian et al., 2019, Fig. 4, attached). We will most likely not need to adopt the dilution set up shown in Fig. 4 as the dune sand will be way less emissive than the volcanic ash.
5) run the Hybrid 3500 PI-SWERL test (same as we use at the ODSVRA) on the samples and collect the emitted PM10 using the DRI Very Sharp Cut Cyclone (VSCC; Kenny et al., 2000; equivalent to a Federal reference Sampler) particulate matter sampler (See Etyemezian et al., 2019, Fig. 4, attached). A battery operated pump and mass flow controller aspirates 16.7 lpm, the design flowrate for the VSCC, out of the PI-SWERL exhaust through the inlet line of the apparatus providing a sample of PM10 onto Teflon and quartz filters (same as speciation samples from CDF).
5) Submit the Teflon and Quartz samples to Steve Kohl (DRI's Environmental Analysis Facility manager) to carry out the same analyses that were done on the speciation samples.
6) Dr X. carries out the source attribution on these samples to determine the relative amounts of mineral dust, fresh and aged sea salt, etc., as a function of distance from the shoreline.
These data will enable us to determine the sea salt contribution that would be associated with saltation of the dune sands. If it is very much less than 22%, then the inference is that the sand is not the main source on exceedance days.
If you think that this is a worthwhile undertaking I can put together a draft budget (and timeline) to provide an indication of how it will impact the remaining budget. I think that the budget can accommodate this work.
Let me know what you think.

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