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Subject: Response to APCD Hearing Board Staff Report and the DRI NFRA Monitoring Station Staff Report

Friends of Oceano Dunes (“Friends”) is a 501(c)(3) California nonprofit formed in 2001 to preserve beach camping, off-highway vehicle recreation and public access at the ODSVRA. Friends does not dispute that wind can emit mineral dust from open sand, that fencing and vegetation can reduce saltation, or that total PM10 at CDF is lower than at its 2017 peak. The question in both documents answered here is narrower: what the new NFRA monitor and the APCD’s updated metrics actually prove about where the PM10 measured downwind comes from, and whether they can carry the compliance conclusions the Staff Report invites.

Executive summary

Two new documents arrive together for the October 14, 2026 Hearing Board meeting. The DRI NFRA report presents the first season from the monitor closest to the ocean. The APCD Staff Report presents the first annual update of the measurement-based “SAG metric” adopted in 2025 and an updated difference-in-differences (DiD) estimate. Both are offered, in the Staff Report’s words (summarized), as arguing against an oceanic source for downwind PM10 and as confirming that dust controls are working. **Read closely, they establish less than that — and in places they establish the opposite of the use made of them.**

1. The NFRA’s central finding helps Friends. The NFRA monitor recorded hourly-mean PM10 of about 36–45 $\mu\text{g}/\text{m}^3$ across wind-speed classes, with no correlation to wind speed, in front of a beach that was closed to OHV activity for the whole monitoring season. A high, wind-independent floor at the water’s edge, on a closed beach, is evidence of a persistent non-saltation background — the marine background Friends has asked to have measured. The report itself attributes that PM10 principally to sea spray and its salt and organic residues. A background of that size, sitting close to the California 24-hour PM10 standard of 50 $\mu\text{g}/\text{m}^3$ before air crosses any riding area, cannot be treated as negligible in the downwind budget.

2. The ratio test cannot exclude the ocean. The report’s test — PM10 per unit wind power density (TPM10:TWPD) — is built for saltation-driven dust, whose emissions scale steeply with wind power. Sea spray is generated by wave breaking and, by the report’s own account, can be out of phase with local wind. A marine aerosol is therefore expected to score low on a wind-power ratio. The low near-shore ratio shows that near-shore PM10 does not behave like saltation dust; it does not show that it is small, absent downwind, or non-marine.

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3. The inland gradient decides nothing without chemistry. Rising PM10 inland is exactly what a coupled ocean–sand system predicts: sea spray deposits on sand on ordinary days and is resuspended, together with mineral grains, on high-wind days. The SAG has already conceded that deposition-and-resuspension pathway (see Friends’s SAG response, incorporated by reference). “Higher inland than at the shore” therefore does not discriminate between “dune-only” and “ocean-banked-plus-dune” explanations. Only speciation along the fetch can do that, and the NFRA report contains no NFRA speciation.

4. “Diminishes downwind” remains unevidenced. The Staff Report states that the contribution of near-shore PM10 diminishes as it moves downwind. Neither document measures a deposition rate, a dispersion rate, or a downwind marine mass balance to support that statement. It sits against the only speciation at CDF (Wang et al., Atmosphere 2023), which found sea salt at about 25% of PM10 mass on exceedance days and about 40% on non-exceedance days, with organic matter — also carried in sea spray — adding about 22% on non-exceedance days. A claim of strong downwind diminishment and those inland shares cannot both be carried without quantifying the resuspension that would reconcile them.

5. The SAG metric failed in its first year. The SAG metric cannot be calculated for October 1, 2025 – September 30, 2026 because wind data from the near-shore S1 tower were unreliable from February 5 to June 2, 2026 — the peak dust season. The metric adopted in October 2025 thus has no value in its first reporting year, still has no compliance threshold (the 2025 Staff Report called setting one premature), and depends on a single wind sensor whose failure went uncorrected for four months. With a Hearing Board decision on the excess-emissions goal due by October 16, 2028, there is at present no operational measurement-based compliance test.

6. The DiD update sharpens, rather than answers, the old questions. For 2025 the DiD estimate is –36.4% at CDF (statistically significant) and –15.0% at Mesa2, whose confidence interval includes zero ($p = 0.055$). That is the same pattern Friends has challenged: a large effect at one downwind monitor, a borderline null at the other. The mitigation footprint has been unchanged at 740.1 acres since 2022, yet CDF worsened in 2025 relative to 2023–2024 on the DiD, on TPM10:TPWD, and on DRI’s machine-learning counterfactual (about 30% improvement in 2025 against about 34% in 2024). The Staff Report calls the reason unknown and offers degraded vegetation as speculation, while stating that no analysis of degraded-vegetation location against monitor fetch has been conducted.

Friends’ requests are collected in Section 13. In substance: publish and speciate the NFRA data; run the speciated beach-to-monitor transect the science has required since 2022; measure or withdraw the “diminishes” claim; report NFRA on event days over a full year; put the S1 record, redundancy and a threshold timetable on the record; re-run the trend on non-marine PM10 and speciate the decline; and state the 2028 decision criteria now, before the remaining two seasons are interpreted after the fact.

How to read this response

Part I answers the DRI NFRA report. Part II answers the APCD Staff Report, including its use of the NFRA report and its updated DiD and SAG-metric reporting. Part III draws the common

thread and states Friends’ requests for the record. Where this filing summarizes earlier Friends analyses — the DiD design challenges, the sea-salt speciation, the Gillies “conundrum” e-mail of October 27, 2022, and the pre-disturbance baseline — it incorporates them by reference and adds only what the two new documents change.

Two conventions govern the whole response. First, percentages are distinguished from absolute concentrations throughout: the compliance question at CDF and Mesa2 is how many micrograms per cubic meter are marine, mineral, and otherwise, not only what share each forms of a changing total. Second, a finding that a monitor or metric cannot decide a question is treated as a finding: it is reported as “unresolved,” not converted by wording into support for either side.

Part I — The DRI NFRA report (May–September 2025)

1 What the report actually found

The NFRA station was installed in May 2025 (instruments returned late from factory servicing) roughly 100 meters from the water, behind a flat beach about 100 meters wide that was closed to OHV activity from March 1 to September 30, 2025 for Western Snowy Plover and California Least Tern nesting protection. It is the closest monitor in the State Parks network to the ocean. DRI summarized wind and PM10 for May–September 2025. Winds reached 12.5 m/s; about 19% of hours met or exceeded the 5.5 m/s sand-transport threshold referenced at 3.5 m above ground. For winds in the 248°–326° sector that can carry air toward CDF, the report compared PM10 against wind speed and against wind power density, following Gillies et al. (2022). Three results matter. First, at the inland sand-sheet stations PM10 rose with wind speed, as saltation-driven dust should. Second, at NFRA the binned hourly-mean PM10 stayed in a narrow band — reported as about 36–45 $\mu\text{g}/\text{m}^3$ — and showed no correlation with wind speed. Third, PM10 per unit total wind power density (TPM10:TWPD) was lower at the near-shore stations (NFRA, ST125, S1 Tower) than inland (Lagrande, Acacia, Midden, Pipeline); the report’s monthly demonstration at Acacia is very tight, as expected for a saltation site. From these results the report concludes, in substance, that high PM10 is not produced near the shoreline per unit wind power, that near-shore PM10 (described as likely sea spray and its salt/organic residues, plus some mineral dust when the beach is dry enough for saltation) did not exceed 50 $\mu\text{g}/\text{m}^3$ in the period, and that such particles disperse and deposit downwind so that sub-50 near-shore concentrations could not contribute substantially at CDF and Mesa2.

Friends accept the measurements as reported, subject to release of the underlying hourly data (Request 1). **The dispute is over the inferences drawn from them.**

2 A flat 36–45 $\mu\text{g}/\text{m}^3$ on a closed beach is a background, not an absence

Begin with the number the report treats as “low.” Binned hourly means of 36–45 $\mu\text{g}/\text{m}^3$ at the water’s edge are not a near-zero baseline. They are 72–90% of the California 24-hour PM10 standard (50 $\mu\text{g}/\text{m}^3$) as an average condition across wind classes — recorded in front of a beach closed to vehicles for the entire season, where the report finds no wind-speed response that would indicate local saltation emissions. Whatever is producing that PM10, it is not OHV-

disturbed sand upwind of the instrument, because there is effectively no upwind fetch of open sand: the air has just crossed surf and a closed, flat beach.

The report's own attribution for that PM10 is marine: sea-spray droplets and, after evaporation, salt and organic particles, with mineral dust added only when the beach is dry and windy enough for saltation. Friends agrees — and notes what follows. The first monitor in the network is already measuring a substantial, wind-independent marine load before air enters the riding area, the restoration area, or any dust-control plot. That load is the input term of the downwind budget. A budget that begins at 36–45 $\mu\text{g}/\text{m}^3$ at the boundary and ends at CDF cannot be analyzed as though it began at zero, and a source that supplies most of a standard's worth of background at the boundary is not a minor term to be waved downwind without a mass balance.

The absence of a wind-speed correlation strengthens rather than weakens that reading. Saltation dust is threshold-driven: little below about 5.5 m/s, rapidly more above it. A PM10 series that does not rise with wind is behaving as a background aerosol behaves — present in light winds, present in strong winds, set by an upstream production process (wave breaking) rather than by local surface emission. **That is precisely the behavior Friends' sea-spray submissions predict, and precisely the behavior that makes a shore monitor useful: it measures what the ocean delivers irrespective of what the dunes then add.**

Two cautions are owed in fairness, and both point to work requested below rather than to dismissal. Binned hourly means are not 24-hour averages and cannot be compared one-to-one with the 24-hour standard; the point here is scale, not exceedance counting. And a single May–September season, beginning late, cannot characterize the marine background in winter storm conditions. Both cautions argue for publishing the hourly record and extending the analysis to event days and a full year — not for treating the first season's floor as evidence that the ocean contributes little.

3 TPM10:TWPD tests for saltation dust; it does not test for sea spray

The report's quantitative centerpiece is the ratio of total PM10 to total wind power density, accumulated over hours with winds in the 248°–326° sector above the 5.5 m/s threshold. Wind power density scales with the cube of wind speed and is a good normalizer for a process — saltation — whose emission flux itself rises steeply with wind power. The Acacia demonstration (a near-perfect monthly linear fit) shows the metric working exactly where it should: on an open sand sheet, for dust the wind lifts from that sheet.

Sea spray is not produced by wind power acting on the sand under the monitor. It is produced by wave breaking in the surf zone, torn spume at high wind, and bubble bursting — processes the report itself notes can be out of phase with the wind measured at the station at the same hour, because swell arriving at the beach reflects earlier, distant storm conditions. A marine aerosol whose production is set offshore and yesterday will, by construction, show a low and noisy PM10 return per unit of today's local wind power. Finding a low TPM10:TWPD at NFRA therefore distinguishes the kind of aerosol (not locally saltation-driven) without measuring its amount or its downwind fate. Used as the report uses it — “high concentrations were not observed close to the shoreline for equivalent amounts of WPD” — the ratio answers a question

Friends is not asking, and leaves the question Friends is asking (how many micrograms arrive, deposit, and are resuspended?) untouched.

There is also a size-and-evaporation reason a water's-edge PM10 measurement will understate the marine PM10 that the same air can present downwind. Fresh spray near the surf includes liquid droplets larger than the PM10 cut; as droplets travel, evaporate and react, mass shifts into the PM10 fraction as dried salt and organic particles — the report itself describes NFRA PM10 as including particles present “upon evaporation of the sea-spray particles.” A monitor 100 meters from the water samples that transformation early. The inland monitors sample it later. Comparing raw PM10 levels station-to-station without accounting for where each sits in the evaporation sequence builds a low near-shore reading into the design.

None of this criticizes TPM10:TWPD for its proper purpose — comparing saltation emissivity across sand stations and tracking dust-control performance, as the ARWPs also use it. **The objection is to extending a saltation normalizer to a non-saltation source and reading the resulting low ratio as an exclusion of that source.** The correct test for the marine term is chemical, not aerodynamic: speciated sampling at NFRA and downwind, on matched winds. Section 5 returns to its absence.

4 “Higher inland” is what the coupled ocean–sand system predicts

The report’s concluding inference is that because PM10 per unit wind power increases with distance from shore, inland concentrations cannot result from an initial high oceanic input. The Staff Report restates the logic as a fork: if the ocean were dominant, NFRA would read high like CDF and Mesa2; since it reads lower, the PM10 must be generated inland. That fork omits the third configuration that the SAG has already conceded and that Friends’ filings describe: the ocean supplies salt and marine organics continuously; a fraction deposits on sand and vegetation along the fetch (most heavily near the beach, decreasing inland); high-wind saltation then resuspends that banked material together with mineral grains, so concentrations build inland even though part of what builds them entered the system from the sea.

Under that configuration — which is not Friends’ invention; the SAG Sea Spray memo of September 22, 2026 describes deposition on sand, storage as films on grains, and release during saltation events, including into PI-SWERL measurements — the expected spatial pattern is exactly the one the NFRA report records: modest, wind-independent PM10 at the shore (direct spray, not yet augmented by resuspension); rising PM10 inland as fetch over sand lengthens and saltation withdraws the banked reservoir while adding mineral dust. The gradient therefore does not discriminate between the report’s preferred explanation and the coupled explanation. A test that yields the same prediction under both hypotheses decides neither.

The chemistry reported at CDF is consistent with the coupled reading and difficult to square with strong oceanic exclusion. Wang et al. (2023), speciating 24-hour samples at CDF in 2021, found sea salt at about a quarter of PM10 mass on exceedance days and about two-fifths on non-exceedance days, and stated that their fresh/aged chemistry could not resolve how much salt arrived directly versus how much had been deposited earlier and resuspended — the separation was, in their word, unresolved. Dr. Gillies’ October 27, 2022 e-mail posed the same unresolved

split and proposed sand-transect and PI-SWERL speciation to determine whether a sea-salt subtraction is warranted against the pre-disturbance level. The NFRA report does not cite that e-mail, does not report that study, and does not speciate a single NFRA filter. Until one of those is done, “not oceanic” is a conclusion in search of its discriminating measurement.

A further coupled pathway, noted in Friends’s companion filings, reinforces the need for chemistry over gradient reasoning: work at Oceano (Huang et al., Atmospheric Chemistry and Physics 2019) links heavy sea-salt deposition to increased susceptibility of the site’s abundant feldspar grains to break into fine suspendable dust under saltation. If that mechanism operates, deposited marine salt contributes downwind twice — once as resuspended salt, once by manufacturing part of the “mineral” fraction. Inland mineral dust is then not, without speciation, proof of a non-marine story.

5 No speciation at NFRA, and no measurement behind “diminishes downwind”

The NFRA report describes its PM10 as “likely composed of” sea-spray, salt, organic and some mineral particles. “Likely” is doing the work that filters and laboratory analysis do elsewhere in this program. No NFRA speciation is reported: no sodium/chloride, no fresh-versus-aged split, no marine organic tracer, no mineral fraction. The station whose entire purpose in the SOA — as amended in October 2025 at the Hearing Board’s direction — is to inform the oceanic-source question has produced a season of total-mass data interpreted without composition. Total mass at the shore compared with total mass inland cannot apportion sources; that was the central limitation of the total-mass DiD, and the NFRA analysis repeats it at smaller scale.

The same gap underlies the transport claim both documents repeat: that as near-shore particles advect downwind they disperse and deposit, their contribution diminishes, and sub-50 $\mu\text{g}/\text{m}^3$ near-shore levels therefore could not contribute substantially at CDF and Mesa2. Dispersion and deposition are real processes; the claim as stated is a quantitative one — that they reduce the marine contribution to insubstantiality over the roughly one-to-two miles to the Mesa monitors — and neither document offers a deposition velocity, a measured deposition flux gradient, a dispersion calculation, or a downwind marine mass balance in its support. Friends raised the same objection to the identical sentence in the provisional 2026 ARWP (Friends letter of October 6, 2026): asserted without evidence, and in tension with the high sea-salt shares measured at CDF itself. If marine mass diminished strongly in transit, the inland salt share should be small; the 2021 speciation found it at about 25% on exceedance days. The reconciliation available — in-transit resuspension of previously deposited salt offsetting deposition losses — is the coupled mechanism of Section 4, and it concedes the ocean a continuing role that the “diminishes” sentence is used to deny.

Friends therefore asks (Requests 2–3) for the measurements that would turn assertion into finding: speciated NFRA sampling; a matched-event speciated transect from beach through the riding/foredune area to CDF and Mesa2, reporting absolute concentrations; and either a quantified deposition/dispersion analysis or withdrawal of the “diminishes/could not contribute substantially” formulation from the final ARWP and future staff reports. The Gillies transect-and-PI-SWERL design of October 2022 remains, so far as the record shows, unexecuted and unbudgeted. Executing it would answer Sections 3–5 of this Part at once.

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6 Design limits of the first NFRA season

Closed beach. The whole of the fetch immediately upwind of NFRA was closed to OHV use from March 1 to September 30, 2025 for nesting birds. The season therefore tests a closed beach, not the riding area. That is useful — it isolates the non-OHV background — but findings from it cannot be transferred to claims about OHV versus non-OHV emissivity, and the report’s silence on any wind correlation is most naturally read as the signature of a closed, flat, frequently wetted beach: a surface the ARWP elsewhere invokes as a saltation source only when “sufficiently dry.” Friends’ October 6 letter noted the beach in front of the monitor is rarely dry enough for sustained saltation; nothing in the NFRA data contradicts that.

One partial season. Late installation (May, after factory servicing) truncates the season at the windy end; May–September excludes the late-autumn and winter storm/swell regime in which sea-spray production and long-period swell are largest. A marine-background characterization that omits the storm season will, on Friends’ hypothesis and on the report’s own out-of-phase observation, understate the annual marine input and its deposition onto sand ahead of spring wind events.

Binned means, not events. Results are presented as means binned by wind-speed class, with standard-deviation bars. Binning is appropriate for the wind-correlation question; it is the wrong summary for the compliance question, which turns on event days — the high-wind, onshore-sector days that produce exceedances at CDF. The report does not list NFRA’s highest days, their synoptic and swell conditions, or their correspondence (or non-correspondence) with CDF/Mesa2 event days in 2025. Without an event-day table, the statement that NFRA did not exceed $50 \mu\text{g}/\text{m}^3$ cannot be mapped onto the 24-hour standard or onto the days that matter downwind.

Wind-only conditioning. The 248° – 326° sector and 5.5 m/s threshold are imported from the CDF dust-event framework. For NFRA’s marine purpose the relevant conditioning also includes swell height/period and tide/wetness state of the closed beach. Conditioning only on local wind builds the out-of-phase problem into the analysis and then reads the resulting weak correlation as absence of source.

None of these limits makes the NFRA useless. Properly speciated, event-analyzed and run for full years, it is the single most informative addition to the network in years — the first instrument positioned to measure the input term instead of debating it. Friends supported its reporting requirement for exactly that reason and asks that it be completed rather than concluded from, prematurely, in its first partial season.

7 What NFRA can and cannot decide

Question	NFRA season 1 (May–Sep 2025) as reported
Is there a substantial PM10 background at the water’s edge without OHV fetch?	Yes — binned means about 36 – $45 \mu\text{g}/\text{m}^3$, wind-independent, attributed by DRI mainly to sea spray and residues. This is a measured input term.

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Does near-shore PM10 behave like saltation dust?	No — no wind-speed correlation and low TPM10:TWPD, unlike inland sand stations. Expected for a marine aerosol; does not measure its size or fate.
How much of NFRA PM10 is salt, marine organic, mineral?	Not measured — no speciation reported.
Direct spray vs. deposited-and-resuspended salt at CDF?	Not decided — requires speciated transect/PI-SWERL work proposed in 2022, not reported here.
Does the marine contribution become insubstantial by CDF/Mesa2?	Asserted, not measured — no deposition/dispersion mass balance; CDF speciation (2021) found ~25% sea salt on exceedance days.
OHV-specific contribution?	Not tested — upwind beach closed all season; no riding-area comparison in this report.

On that record, the NFRA report should be received as baseline characterization of the marine input, and the Staff Report’s characterization of it as arguing against an oceanic contribution should be corrected. The monitor found the ocean’s aerosol at the boundary, in quantity, behaving as sea spray behaves. What happens to it between the surf and the Mesa remains — in the speciation authors’ word — unresolved.

Part II — The APCD Staff Report for October 14, 2026

8 The SAG metric has no 2026 value, no threshold, and a single point of failure

Recall what the SAG metric is: a measurement-based indicator, developed after the Hearing Board’s October 2024 direction and written into the SOA in October 2025, essentially the ratio of downwind PM10 (at CDF, Mesa2) to wind speed measured near the shore at the S1 tower, computed on daytime wind-blown-dust conditions and averaged over October 1–September 30. As controls reduce emissions, the same wind should produce less PM10 and the ratio should fall. The 2025 Staff Report stated that it was premature to set the compliance threshold — the value that would separate compliance from non-compliance — with the intention that a modelled-compliant year’s metric value would later become the threshold. The October 2025 amendment requires State Parks, APCD and the SAG to keep refining the metric and to report it annually, together with NFRA data.

The 2026 update reports that the metric cannot be calculated for 2025–26. Wind data from the S1 tower were unreliable from February 5 to June 2, 2026; because that window covers the season when wind-blown dust events are most frequent, the District (correctly, in Friends’ view) declines to compute a partial-year value as representative. The contractor has since increased QA/QC frequency. Three consequences deserve to be stated plainly rather than absorbed as an “unfortunate failure.”

QA/QC accountability. A four-month undetected or uncorrected failure at the compliance network’s reference wind sensor is a quality-system finding, not only a data gap. The Hearing

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Board is entitled to the QA/QC record: what failed, when the failure signature first appeared in the data, why routine checks did not catch it during the peak season, what data (if any) can be recovered or flagged rather than discarded, and what changed — with dates — in the contractor's checks.

Redundancy by design. A compliance metric that depends on one tower, with no redundant or substitute wind source qualified in advance, will fail again. The metric protocol should specify, before the next failure, the fallback (a named secondary station, a documented transfer relationship to S1, or a model-assisted reconstruction with stated uncertainty) and the rule for declaring a year non-assessable. At present a single instrument failure erases a compliance year; with the decision deadline in Section 11, the program cannot afford another erased year.

Composition, again. The metric divides total downwind PM10 by wind speed. It therefore inherits every composition problem in this filing: marine PM10 that does not scale with local wind sits in the numerator, and a fall in the ratio can reflect changed marine background or vegetation interception of marine aerosol as readily as reduced saltation (see Friends's DiD challenge, §§8–9). Refining the metric, as the amended SOA directs, should include a stated treatment of the marine term — at minimum reporting the metric alongside the best available marine share, and examining a non-marine variant — rather than presenting the total-PM10 ratio as a pure dust-control gauge.

Friends does not oppose a measurement-based metric; Friends asked, in effect, for measurement over modelling throughout this proceeding. But a metric with no current value, no threshold, a demonstrated single point of failure and an unstated marine treatment cannot yet be described to the Hearing Board as the future arbiter of compliance. Section 13 requests a timetable to make it one: threshold method and date, redundancy, and an interim reporting convention for 2025–26 that shows what can and cannot be said about that year instead of leaving it blank.

9 The Staff Report's NFRA framing tests a claim Friends does not make

The Staff Report introduces the NFRA requirement by assuming it responds to claims by off-road advocates that elevated Mesa PM10 comes from offshore rather than from the ODSVRA, and sets the test accordingly: oceanic dominance would mean NFRA readings comparable to CDF/Mesa2; inland generation would mean NFRA readings low by comparison. Friends' actual claim, across the March–October 2026 letters, is different in a way that matters: that the marine contribution at CDF is material (about a quarter of exceedance-day mass in the only speciation, larger on ordinary days), that a presently unapportioned part of it arrives via deposition on sand and resuspension, that vegetation may additionally intercept marine aerosol, and that therefore total-PM10 trends and surface-emission models that never measure the marine term cannot attribute PM10 to OHV activity or to dust controls with the confidence claimed. **That is a claim about a coupled source and an unmeasured term — not a claim that the ocean alone out-emits the dunes or that NFRA must read highest.**

Testing the stronger, unmade claim and reporting it as decided misdirects the Hearing Board's October 2025 direction, which required NFRA reporting without stating the fork the Staff Report now supplies. The correct questions for NFRA reporting are those in Section 7's table: the size

and composition of the boundary input, its event-day behavior, and its measured fate along the fetch. Friends asks that future staff reports evaluate NFRA against those questions, and that the 2026 ARWP's parallel conclusion (that the dataset argues against an oceanic attribution) be revised to reflect what an unspeciated, single-season, closed-beach dataset can support. For completeness, Friends also notes what the NFRA report does not contain on the point that first drew Hearing Board attention to the site: the high-PM10, fresh-sea-salt conditions at the water's edge recorded in Friend's October 6, 2026 letter. A fresh-salt signal at the boundary is the direct-spray end-member of the unresolved split. The DRI report neither confirms nor refutes it — without speciation it cannot — and should say so, with the event data published so others can evaluate it.

10 The updated DiD: -36.4% at CDF, a borderline null at Mesa2

The Staff Report reproduces the District's Annual Air Quality Report analysis through 2025. In brief (paraphrasing the District's method): on analyst-defined wind-event days, the ratio of PM10 at the downwind monitor to PM10 at Oso Flaco is compared between 2017 (least mitigation, the baseline) and each later year; the change in that ratio is reported as the mitigation effect. For 2025 the District reports -36.4% at CDF (95% CI about -23.6% to -47.1%, $p \approx 5 \times 10^{-6}$; median event-day CDF $50 \mu\text{g}/\text{m}^3$ against a modelled $78 \mu\text{g}/\text{m}^3$ without mitigations) and -15.0% at Mesa2 (CI about 0.0% to -27.9%, $p = 0.055$; median 44 against $52 \mu\text{g}/\text{m}^3$). The mitigation footprint in the table has been 740.1 acres in every year from 2022 through 2025 (against 55.3 acres in 2017). Friends' standalone DiD challenge examines the design — peak-year 2017 baseline (97 CDF exceedances), Oso Flaco comparability and untested parallel trends, post-period activity confounding including pandemic-era changes, wind-event selection, total-PM10 marine background (about 25% sea salt on exceedance days; salt plus organics well over half on ordinary days), the unknown composition of the decline (saltation reduction versus vegetation interception of marine aerosol), and the modelled nature of the counterfactual. That analysis is incorporated by reference; the 2025 update changes its application in three ways, none favorable to a settled reading.

Two monitors, two answers. CDF and Mesa2 continue to diverge. A source-level emission reduction upwind of both monitors should move both, scaled by fetch; instead CDF shows a large significant effect while Mesa2's interval includes no effect at the conventional level ($p = 0.055$). The Staff Report notes the expectation that CDF responds more because mitigations concentrate upwind of it — a plausible scaling argument for magnitude, not for a significant-versus-null contrast of this size, and one that still requires the fetch-level analysis the report elsewhere acknowledges has not been done for vegetation condition. **Until Mesa2 is reconciled, the headline should be reported as a CDF result with a non-corroborating second monitor, not as a program result.**

2025 reversal at CDF only. On the District's own meteorology-adjusted family of metrics, 2025 moved the wrong way at CDF. The DiD improvement (36.4%) is smaller than in 2023 (38.1%) and 2024 (39.0%); unadjusted indicators (hours over $300 \mu\text{g}/\text{m}^3$, California-standard exceedances, Rule 1001 violations, annual average) were higher in 2025 than in 2023–2024 though lower than in 2022 and earlier; TPM10:TWPD at CDF was about flat against 2024 and higher than 2023; DRI's machine-learning counterfactual estimates about 30% improvement for

2025 against about 34% for 2024. At Mesa2, by contrast, most metrics improved to their best values. The qualitative agreement of three different methods that CDF worsened while Mesa2 improved is the most informative pattern in the update — and it is a spatial pattern (which fetch, which plots?) that total-mass ratios cannot explain.

Degradation: hypothesis, not finding. The proffered explanation is acknowledged speculation. The Staff Report suggests degradation of some revegetation areas — decayed straw/sterile-grain cover, sand inundation — reducing effectiveness upwind of CDF, notes State Parks’ commitment to 42.5 acres of supplemental planting in the July 2025–July 2026 cycle, and states that no analysis of degraded-vegetation location relative to the monitors has been conducted and that the CDF/Mesa2 contrast on this theory is speculative. Friends agrees with the candor and asks that the analysis now be done and published (Request 7): a current vegetation-condition and surface-cover map scored by fetch to CDF and Mesa2, so the 2025 reversal can be tested against ground condition rather than attributed to it. The same map bears on the vegetation-interception question: mature, dense planting upwind of a monitor intercepts aerosol as well as sheltering sand, and only speciated trends can separate those benefits.

The Staff Report’s conclusion that the program “has been a success,” resting substantially on DRI’s published counterfactual (up to about 35% at CDF and 20% at Mesa2, with avoided-exceedance estimates), goes beyond what its own update supports. Three methods agreeing on a total-PM10 improvement since 2017 is real evidence that controls plus everything else that changed since 2017 lowered total PM10; it is not, without composition, activity covariates, parallel-trend support and a Mesa2 reconciliation, an apportionment of that improvement to dust controls as against baseline regression, activity change, marine-background variation and interception. The Staff Report itself says the reason for the 2025 CDF uptick is unknown. A success conclusion and an unknown reversal can coexist only if the conclusion is stated as provisional and the reversal is investigated — **which is what Friends requests.**

11 Two seasons remain before the 2028 decision

As amended, the SOA requires that by October 16, 2028 the Hearing Board approve that the excess-emissions goal has been met, on State Parks’ application in consultation with the SAG and CARB. The Staff Report reminds the Board that it will ultimately decide sufficiency. Against that date, the October 2026 position is: the modelling path remains the operative compliance route; the measurement-based SAG metric that was to complement or succeed it has no 2025–26 value and no threshold; the NFRA dataset that was to inform the oceanic question is one partial, unspciated season; and the trend attribution still rests on total PM10 without a speciated decline. Each of those gaps is closable within two seasons if the work is specified now. None closes itself.

Friends therefore asks the Hearing Board to use this informational meeting to fix the decision architecture in advance (Request 8): the criteria and evidence by which the 2028 application will be judged (modelled excess emissions, SAG metric against a pre-set threshold, speciated marine treatment, or some stated combination); the treatment of a non-assessable metric year; and the reporting milestones for NFRA speciation, the Gillies transect study, the non-marine DiD, and

the vegetation-fetch analysis. Criteria stated in 2026 will discipline the 2027 and 2028 reports; criteria improvised in 2028 will invite dispute whichever way the decision goes.

Part III — Common thread and requests

12 Both documents measure total mass and conclude about sources

The NFRA report compares total PM10 between shore and inland and concludes about oceanic origin. The SAG metric divides total PM10 by wind speed and is offered as a dust-control gauge. The DiD differences total PM10 between monitors and years and concludes about mitigation effect. In each case the measurement is source-blind and the conclusion is source-specific. That mismatch — not any single arithmetic choice — is the thread connecting Friends’ objections across three filings. The remedy is uniform and feasible: speciate the relevant air (CDF, Mesa2, NFRA, and the transect between), speciate the relevant surfaces (sand transects and PI-SWERL emissions, as designed in 2022), and re-run the trend and metric calculations on the components the SOA actually regulates — emissions in excess of natural, pre-disturbance-consistent levels. Total-PM10 reporting should continue for standards purposes; it should stop being presented, without composition, as source attribution.

13 Requests for the record

Friends respectfully requests that the Hearing Board direct or request the following, with reporting at or before the October 2027 meeting unless otherwise stated:

NFRA data release. Publish the NFRA hourly PM10, wind, and any co-located data for May–September 2025 (and prospectively), with an event-day table for the highest onshore-sector days and their correspondence with CDF/Mesa2 event days; state whether any NFRA filter-based sampling exists.

Speciation and the Gillies study. Speciate NFRA PM10 (fresh/aged sea salt, marine organics, mineral dust) and execute the matched-event speciated transect — beach, foredune/restoration, riding area, CDF, Mesa2 — reporting absolute concentrations, together with the sand-transect and speciated PI-SWERL work proposed October 27, 2022, or state on the record why that design has not been funded or performed.

“Diminishes” — measure or withdraw. Support the downwind-“diminishes” / “could not contribute substantially” statements with a quantified deposition-and-dispersion mass balance for marine PM10 between NFRA and CDF/Mesa2, or withdraw those formulations from the final 2026 ARWP and future staff reports.

NFRA year two design. Report NFRA over a full year including the storm season, conditioned on swell and beach wetness as well as wind, and pre-specify the event-day analysis before the next season is summarized.

SAG metric repair and threshold. Place on the record the S1 tower failure QA/QC chronology (failure mode, detection lag, data disposition), qualify a redundant/substitute wind source and a

non-assessable-year rule in the SAG-metric protocol, state an interim characterisation of 2025–26, and set a date and method for adopting the compliance threshold. Include a marine-term treatment (reporting alongside, and a non-marine variant) in the metric refinement the amended SOA requires.

Trend attribution on components. Re-run the DiD (and report the SAG metric and TPM10:TWPD) on non-marine PM10 using the best available speciation, speciate the post-2017 decline on harmonized methods (absolute component concentrations, before and after), include activity covariates, show pre-trend/parallel-trend support and alternate-baseline sensitivity, and reconcile Mesa2 — or present the –36.4% expressly as a total-PM10, CDF-only modelled association.

Vegetation-fetch test. Publish a vegetation-condition/surface-cover map scored by fetch to CDF and to Mesa2 and test the degraded-vegetation explanation of the 2025 CDF reversal against it, in connection with the 42.5 acres of supplemental planting, before attributing year-to-year metric movement to plot condition.

2028 decision architecture. Adopt and minute the criteria, evidence combination, and milestones by which the October 2028 excess-emissions decision will be judged, including the treatment of the non-assessable 2025–26 metric year and the marine-term accounting, so the remaining seasons are reported against pre-stated rules.

Conclusion

The NFRA monitor's first season found a substantial, wind-independent PM10 background at the water's edge, on a closed beach, which its own report attributes mainly to the sea. That finding does not end the oceanic question; it measures its input for the first time and sharpens every unresolved part of it — composition, deposition and resuspension along the fetch, and apportionment at CDF. The Staff Report's updated trend work finds continued improvement since 2017 with an unexplained, monitor-specific reversal in 2025, and its new compliance metric has no value for the year reported. Friends asks the Hearing Board to receive both documents for what they prove, to correct the oceanic conclusion drawn from the first, and to direct the speciation, redundancy and decision-criteria work set out above while two full seasons remain before the 2028 determination.

Sincerely,



Jim Suty
President, Friends of Oceano Dunes

Cc: Friends BOD & Legal Counsel

Sources and notes

Document (1). Desert Research Institute (2026). Report of Findings for the Northern Foredune Restoration Monitoring (NFRA) Station – May to September 2025 (09-29-2026), prepared for CDPH/ODSVRA. https://slocounty.granicus.com/MetaViewer.php?meta_id=456352 — NFRA siting and closed beach, wind/PM10 summaries, TPM10:TWPD method after Gillies et al. (2022), near-shore vs. inland ratios, sub-50 near-shore statement. Summarized and paraphrased; short phrases only quoted.

Document (2). SLO County APCD (2026). Staff Report for the October 2026 Meeting of the SLO APCD Hearing Board, Stipulated Order of Abatement Case 17-01 (October 14, 2026). https://slocounty.granicus.com/MetaViewer.php?meta_id=456350 — SAG metric background and S1 failure Feb. 5–June 2, 2026; NFRA framing; DiD through 2025 (CDF –36.4%, Mesa2 – 15.0%), TPM10:TWPD and machine-learning comparisons, degraded-vegetation discussion, 740.1-acre footprint, Oct. 16, 2028 decision date. Summarized and paraphrased.

Speciation. Wang, X., Gillies, J.A., Kohl, S., Furtak-Cole, E., Tupper, K.A. & Cardiel, D.A. (2023). Quantifying the Source Attribution of PM10 Measured Downwind of the Oceano Dunes State Vehicular Recreation Area. *Atmosphere* 14(4), 718. <https://doi.org/10.3390/atmos14040718> — CDF speciation Apr.–Oct. 2021: exceedance-day means about 43% mineral dust, 25% sea salt; non-exceedance-day about 40% sea salt, 24% mineral dust, 22% organic matter; direct-vs.-deposited sea-salt separation unresolved.

Methods and orders. Gillies, J.A. et al. (2022), *Atmospheric Environment*: X 13, 100146 (TPM10:TWPD / wind-power method); Huang et al. (2019), *Atmospheric Chemistry and Physics* (Oceano feldspar abundance and salt-assisted fine-dust generation, as discussed in Friends companion filings); SAG Memo: Sea Spray (Sept. 22, 2026) (deposition-resuspension concession); SOA Case 17-01 as amended Oct. 2025 (SAG-metric and NFRA annual reporting) and Oct. 2024 (Oct. 16, 2028 goal date).

Friends record. Friends companion filings incorporated by reference: Challenge to the PM10 Difference-in-Differences Results; Response to SAG Sea Spray Memo (both Oct. 2026); Friends letters Mar. 2, Aug. 19 (x2), Sept. 15, Oct. 6, 2026 (including NFRA fresh-salt observation, ARWP “diminishes” and beach-saltation passages, and the four asks carried forward).

Note. Standards note: California 24-hour PM10 standard 50 µg/m³, annual 20 µg/m³; federal 24-hour 150 µg/m³. Binned hourly means are not 24-hour averages and are used in this response for scale only. Exceedance counts as recorded are not disputed; source attribution of the recorded mass is.