

August 13, 2023

Memo: SAG Review of CDPR "2023 ARWP_APCDDraft_20230801"

From: Scientific Advisory Group (SAG)

To: Gary Willey, San Luis Obispo Air Pollution Control District

Cc: Sarah Miggins, California Department of Parks and Recreation
Ronnie Glick, California Department of Parks and Recreation
Jon O'Brien, California Department of Parks and Recreation
Karl Tupper, San Luis Obispo Air Pollution Control District

The Scientific Advisory Group (SAG) received a copy of the 2023 Annual Report and Work Plan (ARWP) that was submitted to the San Luis Obispo Air Pollution Control District (APCD) by the California Department of Parks and Recreation (CDPR) on August 1, 2023, as required under the terms of the recently revised Stipulated Order of Abatement (SOA), filed on October 18, 2022. Members of SAG had the opportunity to review the document and discuss it in detail, and herewith we provide a formal consensus review delivered within 10 working days of receipt, as per the terms of the SOA.

Summary Statement

Overall, the SAG finds the 2023 ARWP to be a thorough and forthright summary of activities undertaken and completed in the past year. The document retains the structure of previous ARWPs thereby providing continuity in terms of section headings and content narrative. Moreover, extensive references to results from previous ARWPs (in tables and graphs) place the progress made on dust mitigation in this past year into its proper sequential context. This assists the reader immeasurably in understanding the trajectory of progress as well as the changing nature of the dust management challenge as new scientific information becomes available. In several locations in the document, CDPR mentions that the recently revised SOA (2022) substantially alters the manner in which dust mitigation efforts are to be assessed in the future. This is an issue that must be appreciated when evaluating the contents of the 2023 ARWP because the document is written during a period of transition, from old dust reduction objectives stated explicitly in the original SOA (2017; revised 2019) to a new framework considering emissions above naturally occurring conditions, as stated in the recently revised SOA.

Similar to last year, CDPR notes that significant progress continues to be made in mitigating dust emissions from the Oceano Dunes State Vehicular Recreation Area (ODSVRA), and that there is compliance with the SOA. Accordingly, CDPR is not planning to take additional acreage out of the riding area (i.e., land accessible to off-highway vehicle traffic for recreation and camping) for this upcoming year, as was also the case last year. **Although members of the SAG are of the opinion that it may be prudent not to exclose any additional acreage from OHV use at this time, our reasoning is quite different from that of CDPR.** It is not clear that there is compliance with the SOA (for reasons outlined below), and therefore the **SAG believes it to be appropriate at this juncture to offer only a qualified approval of the 2023 ARWP.**

Specifically, we are supportive of the general direction and tenor of the document, but identify several issues that CDPR could address in revision and that APCD should consider in the lead-up to approval of the 2023 ARWP.

The SAG's comments are provided below in two sections. The first deals with the overall context in which this 2023 ARWP was written and the uncertainty that has arisen due to the manner in which the SOA now requires CDPR to meet certain dust reduction objectives (i.e., targets). The second section deals with a number of very specific issues identified by SAG that may help to improve the readability and comprehension of the document, while also enhancing its scientific credibility.

General Comments on Overall Context

As noted in several locations within the 2023 ARWP, the original SOA (2017) and first revision (2019) established explicit targets for reductions in dust emissions (50% of 2013 baseline) and absolute PM₁₀ concentrations (50 µg m⁻³ 24-hr average) toward which CDPR could gauge progress in their dust mitigation program. The recently revised SOA (2022) altered the objectives by requiring that ARWPs submitted by CDPR “**shall be designed to eliminate emissions in excess of naturally occurring emissions from the ODSVRA that contribute to downwind violations of the state and federal PM₁₀ air quality standards**” (Section 3.b.), and that to meet this objective, CDPR “**shall initially reduce mass-based PM₁₀ emissions within the ODSVRA to a level consistent with the pre-disturbance scenario identified by the SAG**” (Section 3.c.).

Effectively, these two sections re-define how compliance is to be evaluated, but they do not describe in precise terms how non-compliance is to be assessed. The 2023 ARWP is, to some extent, held hostage to these recent revisions to the SOA because the progress that CDPR reports on for this past year is evaluated according to targets that are no longer relevant. New targets have yet to be set, but the SAG has proposed an excess emissions framework that could serve as the basis for providing specific meaning to the language used in Sections 3.b. and 3.c. of the current SOA. Much of the next year will be devoted to developing workable solutions by using available modeling tools, historical data, and updated field-based measurements. Until then, the only reasonable approach for CDPR was to assess how much progress was made in mitigating the dust issue in the past year relative to established, but old, targets.

In Section 3.5.2 (*Additional Dust Controls Needed to Achieve SOA Goals*) of the 2023 ARWP, appears the following paragraph (bold added for emphasis):

As described in Section 0 [sic] and 2.2.3, State Parks’ Dust Control Program, as of July 31, 2023, has maintained modeled PM₁₀ mass emissions reductions at a level (100.9 metric tons per day) that is below the original 1939 pre-disturbance scenario (108.4 metric tons per day), and has reduced modeled 24-hour average PM₁₀ concentrations at the SLOACPD’s CDF and Mesa2 air quality monitoring stations to levels that are below the original modeled pre-disturbance concentration levels. In addition, as described in Section 3.5.1.1 and 3.5.1.2, State Parks’ proposed Work Plan is estimated to result in further reductions in PM₁₀ mass emissions from the ODSVRA and 24-hour average concentrations at the SLOACPD’s CDF and Mesa2 air quality monitoring stations.

Accordingly, State Parks is in compliance with the current requirements of the SOA and, therefore, has not proposed new dust control measures as part of its Work Plan and, therefore, no estimates of potential additional dust control measures to be installed at the ODSVRA under the original SOA goals necessary at this time. As described in Section 2.2.1, State Parks has asked DRI to prepare a 1939-pre-disturbance scenario using the same emissivity grid as the revised DRI model. The results of this modeling were not available as of August 1, 2023. DRI anticipates completing the updated modeling by September 2023.

It is not evident to SAG members that CDPR is indeed in compliance with the requirements of the recently revised SOA. The issue that was raised several times last year within the context of the review of the 2022 ARWP (by the SAG as well as APCD) is that the 1939 pre-disturbance scenario utilized an emissivity grid comprised of all non-riding area measurements from 2013 through 2019 (inclusive) whereas the emissions grid for the 2022 model (used for last year's reporting) and again for the 2023 model (used for this year's reporting) is based only on 2019 PI-SWERL measurements. This has been referred to as the 'apples vs oranges' problem, and it was identified last year with the expectation that it would be resolved for the 2023 ARWP.

The Desert Research Institute (DRI) was only recently commissioned to undertake a new set of pre-disturbance modeling scenarios (based on 2019 PI-SWERL measurements exclusively) to resolve the 'apples vs oranges' issue. The strategy is to use only the 2019 PI-SWERL data for both the 1939 pre-disturbance scenario as well as the 2023 model (current landscape with all treatments to date), yielding an 'apples to apples' comparison. Unfortunately, the modeling results will not be available until September 2023, and in this context, it is misleading for CDPR to state unequivocally that they are "in compliance with the current requirements of the SOA." The target of 108.4 metric tons per day, based on the initial 1939 pre-disturbance model has been rendered obsolete. Even though the 2023 modeled emissions from the park are estimated to be 100.9 metric tons per day (lower than the old target), it is not known whether the new pre-disturbance target will be lower or higher than this value, leading to possible assessments of non-compliance or compliance, respectively.

How might it matter if the new pre-disturbance target is less than or greater than 100.9 metric tons per day? If the new target is less than 100.9 metric tons per day, then CDPR would not be in compliance with the SOA. If this is the case, APCD might opt to recommend that CDPR include plans in the 2023 ARWP for additional dust mitigation efforts in the upcoming year. Alternatively, if the new target is greater than 100.9 metric tons per day, then it can be concluded that there is compliance with Section 3.c. of the SOA. Nevertheless, APCD has stated in its review of the 2022 ARWP that the language in Section 3.c. is phrased in such a way that reducing mass emissions is merely an 'initial' step toward satisfying Section 3.b., which deals with emissions in excess of naturally occurring amounts that contribute to downwind violations of the state and federal PM₁₀ air quality standards (i.e., a dust concentration-based standard rather than an emissions mass-based standard). Although CDPR has made progress in reducing PM₁₀ concentrations at downwind monitoring sites, there continue to be violations of the state standard. As with the mass emissions target, the initial 1939 pre-disturbance concentration target is obsolete and in need of being recalculated using only the 2019 PI-SWERL data. In this

context, it can't be claimed that compliance has been achieved nor can it be concluded that there is non-compliance.

Should APCD recommend that CDPR set forth plans to further reduce dust emissions and downwind dust concentrations by installing new dust mitigation measures that would likely require taking more acreage out of the riding designation? This is a management decision that will need to be made within the context of the uncertainty arising from the new, vague language in the recently revised SOA. Specifically, until the excess emissions framework proposed by the SAG¹ has been fully developed and tested, it is difficult to know whether the dust mitigation efforts by CDPR to date are adequate and sufficient to meet the objectives of the recently revised SOA. New models will need to be calibrated and verified to quantify the mass emissions and downwind PM₁₀ concentrations at characteristic sites (yet to be determined) using representative wind events (yet to be identified) according to standardized protocols (yet to be established). These are time-consuming tasks involving a series of decisions needing to be discussed in detail by CDPR, APCD, and SAG personnel. The SAG appreciates that decision-making in the face of such uncertainty can be challenging, especially in light of heightened public interest. Nevertheless, the SAG is tasked with providing the best scientific advice to the parties, and recognizes that scientific knowledge does not come easily or quickly, especially when dust mitigation efforts involve large-scale manipulation of complex geological and ecological systems. In this regard, patience is a virtue because making wrong decisions hastily that lead to irreversible actions can be more damaging than pausing to reflect on what new insights and alternative perspectives might reveal.

In short, the SAG is of the opinion that, regardless of whether the new 1939 pre-disturbance targets (based on 2019 emissivity grid) are lower or higher than the original targets (based on amalgamated 2013 through 2019 emissivity grid), it is prudent not to exclose additional acreage from the riding area until the need to do so has been demonstrated conclusively by the proposed excess emissions framework or by other scientifically defensible means. SAG notes that this cautionary approach is consistent with principles of adaptive management adopted in the approved Particulate Matter Reduction Plan (2013) and as defined in OHMVR Division's Strategic Plan (2009)², which states that adaptive management is:

A type of natural resource management in which decisions are made as part of an ongoing science-based process. Adaptive management involves testing, monitoring, and evaluating applied strategies, and incorporating new knowledge into management approaches that are based on scientific findings and the needs of society. Results are used to modify management policy, strategies, and practices.

¹ SAG Memo – "Framework for Assessing 'Excess Emissions' of PM₁₀ from the Oceano Dunes", January 30, 2023.

² Off-Highway Motor Vehicle Recreation (OHMVR) Division 2009. Strategic Plan – 2009. Sacramento, CA. <http://ohv.parks.ca.gov/pages/25010/files/ohmvr%20strategic%20plan.pdf>

Comments on Specific Issues

Contingency Planning

The 2023 ARWP lists several dust mitigation activities that will be undertaken in the upcoming year, which consist exclusively of conversion, supplemental planting, seasonal closure, and permanent enclosure (nesting area). No new projects are being proposed to enclose additional acreage from the riding area, as was also the case last year. Although the SAG is in general agreement with this strategy, this should not negate the need for contingency planning for the long term. Specifically, if the new 1939 pre-disturbance scenario modelling indicates that the emissions target is less than the predicted 2023 emissions of 100.9 metric tons per day (Table 2-8), then there is compelling evidence to suggest that it may become necessary to enclose more acreage from the riding area (or propose some alternative dust mitigation strategy).

Enclosure is often accompanied with conversion to vegetation cover. It takes time to prepare an area for planting, with additional time needed to collect seeds and germinate plants. The full implementation cycle spans at least 1 full year or more. Given this reality, it may already be too late in the year to prepare sites and acquire plants for a potential December, 2023 through January, 2024 planting effort. However, contingency planning for December 2024 through January 2025 can begin immediately, even if not ultimately required. **SAG therefore encourages CDPR to include a section in the 2023 ARWP that, at minimum, identifies potential areas for possible enclosure and potential restoration should the need arise.** The need for such contingency planning will be signaled by updated targets from the new 1939 pre-disturbance model (available in September, 2023), and ultimately, by preliminary indications from the excess emissions framework as they become available. It should be understood, however, that this should not commit CDPR to carrying through with such possible enclosures unless the evidence compels it.

Plover Enclosure

With respect to management of the plover enclosure, footnote 11 (Page 2-7) in the 2023 ARWP indicates that,

The decision to close this area was an operational choice. If State Parks elects to reopen this area in the future, State Parks would, in coordination with the SAG and the SLOAPCD, simultaneously identify and close other areas for dust control that equal the credited mass emissions reductions occurring from the 293.3-acre enclosure area.

The issue of whether the plover enclosure is a permanent dust control measure or not has been questioned by APCD in the past. There are at least three elements that require clarification. First, how is the management of the plover enclosure for purposes of nesting habitat consistent with (or contrary to) the dust mitigation management of the area, and how does CDPR envisage the long-term evolution of this area (e.g., return to natural foredunes versus occasional treatment with interventions)? Second, if the area were to be reopened to OHV use (even seasonally), what other areas can be closed or treated for equivalent mass emissions reductions? This follows

directly from the need to propose contingency plans (see point above). Third, how exactly does simply enclosing this area lead to reductions in dust emissions? Section 2.1.1.6 (Western Snowy Plover Enclosure) of the 2023 ARWP (Page 2-6) is rather vague in this regard, and it seems beneficial to include some additional information on what the potential mechanisms are for dust control from the plover enclosure. For example, it is known that there is a gradient toward reduced emissivity to the south, likely due to increasing grain size. In addition, the absence of OHV traffic has allowed natural vegetation to take hold and incipient foredunes to evolve. The combination of surface topography and placement of large woody debris (for habitat improvement) has the effect of reducing surface shear stress on intervening open sand surface, which may lead to dust control benefits. Thus, the areal extent and intensity of saltation are reduced (i.e., less dust emitted) and the potential for sand deposition is enhanced (i.e., burial of extant dust in surface sediments). These are some possible explanations of why dust emissions reductions might occur on an enclosed area, but they have yet to be demonstrated. **SAG recommends that more detail be provided regarding the potential mechanisms by which the permanent plover enclosure may lead to reductions in dust emissions.** These explanations could be added in Section 2.1.1.6 or alternatively at the end of the first paragraph on Page 2-2, where it is stated that "While the closure may support the natural progression of foredune formation in this area..."

Dust Mitigation Targets vs Indicators

Section 2.3.7.1 (Dust Mitigation Targets) includes three key targets: (1) Dust Mitigation Treatments; (2) PM₁₀ Mass Emissions Reductions; and (3) PM₁₀ Concentration Reductions. **SAG is of the opinion that the first listed target (acreage under treatment) is not a target, per se, but rather an indicator of progress toward the overall objective of dust mitigation from the ODSRVA. SAG recommends that the discussion regarding treatment area and Figure 2-22 be placed in Section 2.3.7.2 (dealing with indicators).**

The sub-section on the Foredune Restoration Area (Section 2.3.7.2) focuses exclusively on vegetation cover as the primary indicator of progress. The reader is implicitly led to the conclusion that T6 is the best-performing treatment (because of greatest vegetation cover). This ignores several other indicators developed by UCSB that are reported on annually for the ARWP to assess progress and effectiveness of the foredune restoration project. In fact, T3 is the best-performing treatment when all six criteria are accounted for, as discussed in the UCSB UAS Survey Report (See Attachments). **SAG recommends that Section 2.3.7.2 make mention of the six criteria and provide a brief summary of performance of the various treatments, leading to the conclusion that T3 is currently (as of 2023) the best performer.** This conclusion is also supported, in part, by the line intercept sampling results reported in Table 2-15, which indicate that T3 has the greatest range in percent cover (0% - 24.8% in 2022), suggesting greater diversity of surface characteristics than T6 (8.2% - 21.4% in 2022) as is expected for naturally 'patchy' foredune vegetation assemblages.

Public Relations Campaign

SAG members were disappointed that the 2023 ARWP provides virtually no detail on the proposed public relations campaign, which the SAG has consistently stated is a critically

important part of the overall dust mitigation program. As such, the public and various stakeholders continue to lack ready access to reliable and scientifically defensible information on key processes and the overall progress that has been made to mitigate dust emissions at the ODSVRA. Within such a knowledge vacuum, misconceptions arise and misinformation enters into the public debate. There is a positive story to tell here, and it is backed by concrete data and solid scientific facts. This version of the 2023 ARWP did not include the proposed public relations campaign document as an attachment, and more concerning is that the timeline suggested in Table 5-7 indicates that the task was started and has been ongoing for June and July of 2023. We see little evidence of this. **SAG encourages CDPR to provide more detail on its proposed public relations campaign in the main body of the report, as well as to provide firm dates and a plan to launch and implement the campaign as expeditiously as possible in a substantive and effective manner.**

Excess Emissions Framework

The SAG notes that the excess emissions framework is in its conceptual stages and requires more development to bring to fruition for purposes of regulatory decision making. As such, it is imperative that substantive efforts be made as quickly as possible to realize the objectives outlined in Sections 3.b. and 3.c in the recently revised SOA (2022). **SAG encourages the scheduling of formal meetings between CDPR, APCD, and SAG to discuss various critical elements of the emissivity grids and model nuances so as to reach agreement on the range of parameters that will be included in the pre-disturbance scenario that will define naturally occurring emissions from the ODSVRA.** Such meetings should begin as soon as possible, as a matter of urgency, and should be held on a recurring basis throughout the work year.

Editorial Issues

SAG members noted a number of editorial issues and typographical errors in the document. In addition, there were several missing attachments with only 'place holder' pages, indicating that this draft version of the 2023 ARWP is incomplete. SAG has decided to deal with these issues under separate cover, communicated directly to CDPR.

Respectfully,

The Scientific Advisory Group

Bernard Bauer (Chair), Carla Scheidlinger (Vice-Chair), Mike Bush, Jack Gillies, Jenny Hand, Leah Mathews, Ian Walker