

BEFORE THE HEARING BOARD OF THE SAN LUIS OBISPO COUNTY
AIR POLLUTION CONTROL DISTRICT
STATE OF CALIFORNIA

In the Matter of

SAN LUIS OBISPO COUNTY AIR POLLUTION CONTROL DISTRICT,
Petitioner,

v.

CALIFORNIA DEPARTMENT OF PARKS AND RECREATION OFF-
HIGHWAY MOTOR VEHICLE RECREATION DIVISION, Respondent.

Case No. 17-01

AIR POLLUTION CONTROL OFFICER'S
APPLICATION TO MODIFY THE TERMS AND CONDITIONS OF
STIPULATED ORDER OF ABATEMENT IN CASE 17-01
DATED OCTOBER 5, 2022

Hearing Date: October 14, 2022

Time: 9:00 am

Location: REMOTE VIRTUAL public hearing via Zoom Webinar
teleconference at <https://us02web.zoom.us/j/81331654308> and

broadcast via YouTube Livestream at

<https://youtu.be/Pd9dhAWrUag>

Introduction

In accordance with Section 6.a of the original Stipulated Order of Abatement in Case 17-01 (SOA), issued April 30, 2018, the Air Pollution Control Officer (APCO) of the San Luis Obispo County Air Pollution Control District (District) submits this Application to Modify the Terms and Condition of said SOA. For the reason set forth in the following sections, good cause exists for the San Luis Obispo County Air Pollution Control District Hearing Board (Hearing Board) to approve the proposed amendment.

Furthermore, the reason set forth in the following sections, the APCO has provisionally approved the 2022 Annual Report and Work Plan (ARWP) that was submitted by the California Department of Parks and Recreation (State Parks). The APCO's proposed conditions of final approval are described and justified herein. These proposed conditions are described here for the sake of transparency and to solicit input from the public and the Hearing Board; that input will be used to finalize the conditions of approval.

Executive Summary

At the June 17, 2022, meeting of the Hearing Board, the District and State Parks submitted a Joint Status Report on Implementation of the SOA.¹ Among other things, this report noted:

1. Over 700 acres of the Oceano Dunes State Vehicular Recreation Area (ODSVRA) are now permanently closed to vehicles and providing dust control benefits.
 - a. Of this, 412.5 acres of dust control measures have been implemented in response to the SOA or previous agreements with the District.
 - b. Unrelated to compliance with the SOA, in the fall of 2021 State Parks implemented year-round closure of the nearly 300-acre Plover Exclosure area, which previously had been opened seasonally. This closure is expected to result in additional air quality benefits.
2. Analysis of ambient PM₁₀ monitoring data by the District shows that as the extent of ODSVRA dust mitigations has increased, air quality downwind has improved. Compared to 2017, in 2021 wind-event-day PM₁₀ at CDF improved by 33.5% after controlling for meteorology. During this period, the scale of mitigation projects increased from about 55 to 323 acres, a net increase of 267 acres. This improvement in air quality is corroborated by State Parks' air quality modeling, which predicts a 36.8% improvement at CDF over the same period.
3. In February 2022, the Scientific Advisory Group (SAG) presented a recommendation for a modification to the SOA Section 2.c emissions reduction target. Specifically, they recommended changing the existing target—a 50% emissions reduction from pre-mitigation levels—to reducing emissions to pre-disturbance levels based on a 1939 vegetation scenario.
4. The District, SAG, and State Parks all agree that the goal stated in SOA Section 2.b—achieving the state and federal ambient PM₁₀ standards—needs to be revisited. Sand dunes are a natural feature of this area, and that even without the long history of vehicular disturbance,

¹ San Luis Obispo County Air Pollution Control District and California Department of Parks and Recreation Off-Highway Motor Vehicle Division, "Joint Status Report on Implementation of the Stipulated Order of Abatement in Case 17-01," June 14, 2022. Available online at https://slocounty.granicus.com/MetaViewer.php?meta_id=414115.

the area would be naturally dusty and would likely still see exceedances of the PM₁₀ air quality standards if mitigated to its natural state.

5. Unless modified, the SOA will expire on December 1, 2023; however, continued monitoring and assessment beyond 2023 is needed to assess whether the air quality benefits predicted by the modeling actually occur. If the model estimated reductions do not ultimately abate the dust issue, then additional mitigation may be needed.

On August 1, 2022, State Parks submitted a First Draft 2022 ARWP.² The District³ and SAG⁴ provided comments to State Parks on the draft, and on September 14, State Parks submitted a revised Second Draft.⁵ On September 27, the SAG provided comments on the Second Draft.⁶ Two days later, on September 29, the APCO provisionally approved the Second Draft, stating that “After considering all public comment received at the workshop [to be held October 14, 2022], the District will make a final decision on the draft ARWP. Approval would likely be conditional.”⁷ The timeline for submittal and review of the ARWP was followed as specified in the Order to Modify the Existing Stipulated Order of Abatement, issued November 18, 2019.⁸

Key points in the Second Draft ARWP are:

1. There are now 705.5 acres of the ODSVRA that are under some form of year-round dust control. Most of this acreage is in areas of the park that were previously open to vehicles, at least seasonally.
2. There are an additional 34.6 acres of current riding area which are now closed seasonally, from March 1 to September 30, and providing a dust control benefit during the windiest part of the year.

² California Department of Parks and Recreation, “Oceano Dunes State Vehicular Recreation Area Dust Control Program: DRAFT 2022 Annual Report and Work Plan,” August 1, 2022. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/Draft2022ARWP_202208012.pdf; attachments available at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/Draft2022ARWP_Attachments_ALL_Reduced.pdf.

³ Gary E Willey to Sarah Miggins, “Comments on the California Department of Parks and Recreation’s August 1, 2022, Oceano Dunes SVRA Draft 2022 Annual Report and Work Plan in Response to Stipulated Order of Abatement Number 17-01,” August 23, 2022. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2022%20Draft%20ARWP%20APCD%20Comments%20Cover%20LTR_pdf.pdf. Attachment available at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/APCD%20Comments%20on%20SP%20Draft%202022%20ARWP_pdf.pdf.

⁴ Scientific Advisory Group, “SAG Review of CDPR “DRAFT 2022 Annual Report and Work Plan” (dated August 1, 2022),” August 15, 2022. Available online <https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/SAG%20comments%202022%20ARWP%20-%2020220801%20version.pdf>.

⁵ California Department of Parks and Recreation, “Oceano Dunes State Vehicular Recreation Area Dust Control Program: 2nd DRAFT 2022 Annual Report and Work Plan,” September 14, 2022. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2ndDraft2022ARWP_2022914.pdf; attachments available at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/2ndDraft2022ARWP_Attachments_ALL_Reduced.pdf.

⁶ Scientific Advisory Group, “SAG Review of CDPR “2nd DRAFT 2022 Annual Report and Work Plan” (dated September 14, 2022),” September 27, 2022. Available online at <https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/SAG%20comments%202022%20ARWP%20-%2020220914%20version%20-%20final.pdf>.

⁷ Gary E Willey to Sarah Miggins, “Provisional Approval of California Department of Parks and Recreation’s September 14, 2022, Second Draft of 2022 Annual Report and Work Plan in Response to Stipulated Order of Abatement Number 17-01,” September 29, 2022. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/Provisional%20Approval_SIGNED.pdf.

⁸ All of the aforementioned documents and other related materials are available on the District’s website at <https://www.slocleanair.org/air-quality/oceano-dunes-efforts.php>.

3. Air quality modeling, under both the “original” protocol and a “revised” methodology, indicates that with these controls:
 - a. the SAG-recommended revised emissions target has been met.
 - b. the original SOA Section 2.c emissions reduction target—a 50% reduction in emissions from pre-mitigations levels—has not yet been achieved.
4. Air quality modeling under the “revised” methodology indicates that implementation of the “Secondary Work Plan” with additional dust controls would be sufficient to meet the original SOA Section 2.c emissions reduction target. The Secondary Work Plan was not evaluated under the original model due to time constraints.
5. The Secondary Work Plan would be implemented if the SOA emissions reduction target is not changed. It calls for:
 - a. 35.1 acres of new straw and sterile cereal grain treatments in the open riding area,
 - b. 12.4 acres of vehicle exclosures within the open riding area, and
 - c. Revegetating 59.0 acres of Plover Exclosure.
6. The ARWP also reports on the ambitious research and monitoring activities proposed in the previous year's ARWP, and it plans for continued activities research and data collection as well as continued refinement of the air quality model used to guide the dust control program.

The District's provisional approval of the ARWP and proposed amendment to the SOA are designed to be complementary; however, as stated in the APCO's provisional approval letter, “If State Parks does not stipulate to the amendment, or if the Hearing Board declines to approve it, State Parks will be required to implement the Secondary Work Plan described in Section 3.2 of the draft ARWP.”

As discussed in more detail in the following sections, the District supports the revised emissions target recommended by the SAG. As shown by their thorough analysis, the revised target is scientifically justified in assuming that “the objective is to reduce emissions of PM₁₀ from the ODSVRA to a level consistent with dust emissions prior to significant [vehicular] disturbance.” For this reason, the proposed amendment updates the SOA Section 2.c accordingly. The amendment also revises SOA Section 2.b to clarify that Respondent State Parks is only required to prevent exceedances of air quality standards that are related to the history of vehicular disturbance at the ODSVRA.

The proposed amendment would also extend the term of the SOA by two years. This is needed to provide time for additional mitigation measures to be deployed if updated modeling (discussed below) determines that more dust controls are needed to achieve the revised emissions target. It also provides time for revegetated and newly exclosed areas to mature, so that it can be confirmed whether the model-predicted air quality benefits are actually observed.

As detailed in subsequent sections, the District has significant concerns with some of the assumptions in the current and revised modeling schemes and with the accounting of emissions reductions. The SAG also expressed some concerns in their comment letters. The APCO is thus considering applying certain conditions to any final approval of the ARWP. These are discussed in subsequent sections and compiled in the Attachment; they may be revised or augmented based on feedback received at the public workshop.

Whether the Hearing Board amends the SOA as requested or not, the proposed conditions of approval for the ARWP require State Parks to re-estimate emissions and downwind concentrations with certain updates to the modeling methodology. With these changes, the modeling may indicate that the SOA emissions reductions target—either the original Section 2.c target or an amended one—has not been met. If this is the case, more mitigations would be required. Under an amended SOA, additional dust controls would be proposed and approved using the ARWP process. If the SOA is not amended, then in the fall of 2023 the District would likely apply to the Hearing Board for an SOA amendment requiring additional dust controls.

General Comments on the Second Draft ARWP

The Second Draft of the 2022 ARWP addresses many of the issues raised by the District and the SAG in our comment letters on First Draft; as such it is provisionally approvable. A key change in the Second Draft is the inclusion of a “Secondary Work Plan” (Section 3.2) which plans for the installation of 47.5 acres of new dust control measures and 59.0 acres of straw and sterile grain in the Plover Enclosure. With these new controls, the Secondary Work Plan demonstrates compliance with the existing SOA Section 2.c emissions target under the “revised” modeling scheme, as described in Section 3.4, and Table 3-1.

The Second Draft also demonstrates compliance with the alternative emissions target recommended by the SAG. This target is based on achieving emissions consistent with a pre-disturbance scenario that is based on non-riding area emissivity and the vegetative coverage documented in 1939 aerial photography. Under both the “current” and the “revised” modeling schemes, the ODSVRA already achieves the proposed emissions target without the need for any additional dust controls. See section 2.2.3 and Tables 2-10 and 2-11 of the Second Draft.

Adopting the alternative target in lieu of the target in the current SOA needs concurrence from the Hearing Board. In tandem with provisionally approving the ARWP, the District is submitting this application to the Hearing Board to make this change. If State Parks does not stipulate to the amendment, or if the Hearing Board declines to amend the SOA as requested, then State Parks will be required to implement the Secondary Work Plan.

As discussed in the following sections, the District still has significant concerns about some of the assumptions in the emissions modeling and how emissions reductions are “credited”. Therefore, whether the Hearing Board approves the proposed SOA amendment or not, the conditions of final approval will require that certain changes to the modeling are implemented in the coming months. These changes may result in different emissions estimates from what are reported in Tables 2-10 and 2-11 in the Second Draft, and they may indicate the need for additional mitigation measures in the future.

SAG-Recommended Mass Emissions Target

The District will support the SAG’s recommendation⁹ and State Park’s request to amend the emissions reductions target provided some key issues are addressed. We continue to stress that this

⁹ Scientific Advisory Group, “Scientific Basis for Possible Revision of the Stipulated Order of Abatement (SOA),” February 7, 2022. Available online at https://slocounty.granicus.com/MetaViewer.php?meta_id=414120.

change is justified if, in the words of the SAG, “the management objective is to reduce emissions of PM₁₀ from the ODSVRA to a level consistent with dust emissions prior to significant [vehicular] disturbance.” This important qualification is not addressed in State Parks’ discussion of the recommendation.

An alternative management objective could be “to reduce dust emissions to a level consistent with what they would be if the area had never been disturbed by vehicles”—a scenario which would include non-native invasive plant species that provide enhanced stabilization. That said, we recognize that modeling such a scenario entails significantly more uncertainty and speculation. As noted by the SAG in Part L of their comment letter on the Second Draft, using the District’s suggested scenario is complicated by a number of issues—notably the presence of invasive weed in present-day non-riding areas—that would require “significant guesswork” to sort out. We also acknowledge that there are many issues that can affect vegetation rates over time and that the SAG-recommended target is a refinement to the current SOA target.

In both the SAG document recommending the new target and in the ARWP, the revised mass emissions target is usually expressed as 40.7% of 2013 baseline emissions. The District has refrained from defining the revised target in these terms. This is because using 2013 PI-SWERL data to define the emissivity grid for the baseline scenario, while using data from other years in the comparison scenario, appears to lead to the generation of “artificial” emissions reductions that are not attributable to management actions taken by State Parks. This issue is fully described in subsequent sections. Thus, to properly calculate a percent reduction *from* 2013, either the baseline would need to be remodeled using PI-SWERL data from the same years that were used in the pre-disturbance scenario, or the pre-disturbance scenario would need to be remodeled using exclusively 2013 PI-SWERL data. Either way, the estimated percent reduction would change, so requiring a reduction of specifically 40.7% may be insufficient (or more than sufficient) once the modeling is further refined.

The SAG-recommended modeling of the pre-disturbance scenario yielded an emission estimate of 108.4 metric tons per day under certain modeling assumptions. We considered revising the target in SOA Section 2.c to state that riding area emissions shall be reduced to this specific level. Instead, we have omitted a specific mass emissions target to allow for the possibility of further refinements to the modeling of the pre-disturbance scenario; however, if the modeling of the pre-disturbance scenario is not updated, then the emissions target would be 108.4 metric tons per day.

Thus, the proposed SOA amendment changes the Section 2.c goal to:

To meet the objective of 2b, the Respondent shall initially reduce mass-based PM₁₀ emissions within the ODSVRA to a level consistent with the pre-disturbance scenario identified by the SAG in their “Scientific Basis for Possible Revision of the Stipulated Order of Abatement,” dated February 7, 2022. Emissions shall be calculated using the meteorology of the 10 highest emission days for the period May 1 through August 31, 2013, and a representative emissivity grid derived from PI-SWERL measurements as recommended by the SAG, and as determined by air quality modeling carried out by the California Air Resources Board (CARB), or other modeling groups subject to the review of the Scientific Advisory Group (SAG).

“[P]re-disturbance scenario identified by the SAG in their report” means using the 1939 vegetation mask identified in the SAG report and using non-riding area emissivity to represent the 2013 riding area. “[A] representative emissivity grid derived from PI-SWERL measurements as recommend by the SAG” means an emissivity grid that is representative of emissions from the area. This language is meant to provide flexibility to use PI-SWERL data from years other than 2013 for the emissivity grids used in various scenarios. It is also intended to allow for the modeling of the pre-disturbance scenario to be updated, e.g., with newer PI-SWERL data or to eliminate the dependence on 2013 data. “Emissions shall be calculated using the meteorology of the 10 highest emissions days for the period May 1 through August 31...” means that all modeling shall continue to use the meteorology of the same 10 days used in previous ARWPs. This is consistent with SAG’s recommendation in Part K on their comment letter on the Second Draft. Finally, references to “baseline” emissions in the original Section 2.c have been removed, as the revised target requires reducing emissions to a pre-disturbance level rather than *from* a pre-mitigation baseline level.

Baseline Emissivity Grid

In the District’s comments on the First Draft ARWP, we noted our concern about the use of different emissivity datasets for the baseline versus mitigation scenarios in the revised modeling. Specifically, for the baseline, the revised modeling uses an emissivity grid derived from 2013 PI-SWERL data (as required by the SOA), while for mitigation scenarios it employs an emissivity grid derived from 2019 data. The new data and analysis presented in the Second Draft ARWP only add to our concerns.

As shown in Figures 2-10 and 2-11 of Section 2.3.5.1 of the Second Draft, measurements of riding-area emissivity made in 2013 are much higher than the measurements made in subsequent years. As shown Table 2-9, baseline emissions—modeled with 2013 PI-SWERL data and assuming no mitigations—are estimated at be 182.8 metric tons per day; using 2019 PI-SWERL data instead results in estimated emissions of 154.4 metric tons per day. Thus, even if State Parks had not deployed any dust controls between 2013 and today, the revised model would nonetheless indicate a 23.1 metric tons per day improvement, which is an emissions reduction of 15.5%. State Parks has deployed over 400 acres of mitigations since the start of the SOA, so the emission reduction associated with this modeling change is less than 23.1 metric tons per day. Comparing Tables 2-9, 2-10, and 2-11, it appears that this modeling change results in a net benefit of 16.5 metric tons per day, which is 9.0% of baseline emissions.¹⁰ These are *artificial* emissions reductions, resulting purely from using different PI-SWERL datasets for the “before” (i.e., baseline) and after scenarios.

We recognize that the current SOA requires using 2013 as the baseline. We further recognize that the SAG recommended using 2019 PI-SWERL data when modeling mitigation scenarios. This recommendation was made because “post-2013 measurements indicate that the spatial distribution

¹⁰ Table 2-10 indicates that including the additional dust control benefit from closure of Plover Exclosure, the original model estimates that mass emissions from the ODSVRA have been reduced by 74.6 metric tons per day (182.8 – 108.2). Table 2-11 indicates that under this same scenario, the revised model estimates a reduction of 78.8 metric tons per day (182.8 – 104). This is a net decrease of 4.2 metric tons per day (74.6 – 78.8). According to lines 2 through 5 in Table 2-9, the net effect of incorporating more realistic assumption about the emissions from within wind fence arrays, the foredune project, and the Plover Exclosure, and incorporating CFD modeling of foredune sheltering is a net increase of 12.3 metric tons per day (1.5 + 3.4 + 9.3 – 1.9). Thus, the change in emissions attributable to using the 2019 PI-SWERL grid for unmitigated areas is 16.5 metric tons per day (12.3 + 4.2).

of PM10 emissivity in the Riding Area has changed over time (both positively and negatively).⁹ It seems that when making this recommendation, the SAG did not anticipate mean riding area emissivity being roughly 2.5 to 3-fold lower in 2019 than in 2013 (as shown in Figure 2-10, Second Draft). In their comment letter on the First Draft they state, “the choice of PI-SWERL years (i.e., 2013 versus 2019) appears to drive a significant change in PM10 emissions.” In their comments on the Second Draft (Part K), they state “the analysis presented in [the Second Draft] calls into question the use of 2013 emissivity data as the baseline for comparison of subsequent changes in PM₁₀ emissions, as required by the SOA. As indicated in Fig. 2-10 and Fig. 2-12, emissivity across the ODSVRA is substantially higher in 2013 than in 2014-2016, despite the lack of significant management actions or changes in admissions totals during this period.”

If this gross change in emissivity were due to some action taken by State Parks, or to a change in conditions that they could ensure would remain, then it would be valid to “take credit” for the associated change in emissions of 16.5 metric tons per day. However, this does not appear to be the case. Section 2.3.5.1 of the Second Draft offers a few potential reasons for the change, but without further testing these assertions are unverified, as described below.

- **Precipitation.** Citing precipitation data for March through September from weather stations in Pismo Beach, San Luis Obispo, and Arroyo Grande; the Second Draft argues that 2013 was especially dry, potentially causing increased emissivity. The District is skeptical of this explanation for several reasons.

Very recent precipitation will suppress saltation, but a precipitation event is unlikely to significantly affect saltation occurring several weeks or months thereafter. The 2013 PI-SWERL measurements were made in late August and early September,¹¹ so were unlikely to be affected by precipitation (or lack thereof) in the preceding March-July. To assess the possible effect of precipitation on emissivity, it would be more informative to compare the precipitation received in the week or two prior and during each year’s measurement campaign.

Furthermore, while 2013 had the lowest average March-September rainfall among the weather stations evaluated in Second Draft, it is not clear that this is true at the ODSVRA itself. The Second Draft analyzed data from 4 sites, some more than 10 miles away. Data from closer sites reveals a more complicated picture. The Nipomo CIMIS station is located about a half mile from the Mesa2 monitoring station, and in 2013 it received 4.71 inches of rain from March through September. The next several years were indeed wetter, but 2020 and 2021 were drier, with 2.64 and 1.44 inches of precipitation, respectively.¹² Meanwhile,

¹¹ Desert Research Institute, “2013 Intensive Wind Erodibility measurements at and Near the Oceano Dunes State Vehicular Recreation Area: Report of Findings,” July 20, 2015. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/APCD%20Exhibit%205%20-%202013_PI-SWERL_Report%20of%20Findings_07_2015_Final.pdf.

¹² Data downloaded from the California Irrigation Management Information System (CIMIS) website at <https://cimis.water.ca.gov/Default.aspx>.

2013 was the driest March-September over the last decade in Guadalupe¹³ and Oceano,¹⁴ which are about 5 miles to the south and 1 mile to the north of the ODSVRA, respectively. This data is summarized in Table 1, below. If the analysis is restricted to just August and September data (the months when the 2013 PI-SWERL measurements were made), then 2013 appears completely typical as shown in Table 2.

Site	2013	2014	2015	2016	2017	2018	2019	2020	2021
Nipomo	4.71	6.18	4.90	7.22	6.32	8.70	5.15	2.64	1.44
Guadalupe	0.99	1.97	1.86	2.90	2.09	4.11	4.25	5.36	NA
Oceano	0.59	1.49	2.17	2.68	2.64	5.44	4.78	7.80	0.91

Site	2013	2014	2015	2016	2017	2018	2019	2020	2021
Nipomo	1.00	1.05	1.03	1.59	1.12	1.13	0.19	0.00	0.2
Guadalupe	0.04	0.02	0.04	0.02	0.34	0.01	0.02	0.06	NA
Oceano	0.00	0.00	0.08	0.00	0.20	0.00	0.00	0.00	0.00

- Park Admissions.** The Second Draft suggests that declining Park Admissions could account for some of the decrease in emissivity observed since 2013. The District is skeptical of this explanation. While admissions dropped by 28% over this period, the decrease in mean measured emissivity is much larger—a factor of 2.5 to 3, according to Figure 2-10. Furthermore, admissions were highest in 2014, yet that year had the second lowest measured emissivity according to the figure. Figure 2-10 shows that from most emissive to least, the ranking of annual mean emissivity at the highest wind shear is 2013, 2016, 2015, 2019, 2014, and finally 2022.¹⁵ According to Figure 2-12, the ranking of annual Park admissions is 2014, 2013, 2015, 2018, 2019, 2016, 2017, and finally 2021. Visually, there does not appear to be any correlation between these values; comparing the years with data for both emissivity and admissions by a Spearman Rank-Order Correlation test rejects the hypothesis that there is a significant association between emissivity and admissions ($\rho(3) = -0.3, p = 0.68$).

The District recognizes that the analysis presented in Section 2.3.5.1 of the Second Draft is preliminary and a more comprehensive analysis is forthcoming. For consideration in that analysis, we offer the following observations:

¹³ Data downloaded from the Santa Barbara County Flood Control District at <https://files.countyofsb.org/pwd/hydrology/historic%20data/rainfall/352mdd.pdf>.

¹⁴ Data downloaded from County of San Luis Obispo Public Works at <https://wr.slocountywater.org/>.

¹⁵ Emissivity values are quoted from Figure 2-10 here rather than Figure 2-12 as there appears to be a typo in the latter. It depicts higher mean emissivity at the E2000 step than at E3000 and E3500 stop for 2016.

- **Timing of measurements.** Desert Research Institute’s recent publication, “The role of off-highway vehicle activity in augmenting dust emissions at the Oceano Dunes State Vehicular Recreation Area, Oceano, CA,”¹⁶ (DRI Study) found that when off-roading is allowed at the ODSVRA, emissivity increases from the spring through the summer, peaking in August before easing slightly in September. This observation is based on the ratio of total PM₁₀ to total wind power density. (The study also presents PI-SWERL data, but it is difficult to discern how this data evolves from month to month [e.g., in the publication’s Figure 15] as they normalized by month to 2020 data). The 2013 PI-SWERL measurements were made in late August and early September when emissivity peaks, according to the study. The 2019 measurements were made in the spring, when emissivity tends to be lower. This could be one factor why the 2019 measurements are so much lower than the 2013 measurements.
- **Extent of dust controls.** According to Attachment 1 of the ARWP, there were only 3.7 acres of dust controls within the ODSVRA in 2013 and 48.2 acres in 2014. According to Figure 2-10 of the Second Draft, emissivity decreased by a factor of about 2.5 to 3 over this same period. It seems unlikely that this large change in measured emissivity could be related the small expansion (44.5 acres) of the dust controls. Only 13.5 acres of the new controls were in the riding area, so the impact of these controls on traffic patterns was likely minor and cannot explain the wholesale reduction in measured emissivity across the riding area. Furthermore, as dust control acreage continued to increase in subsequent years, the measured emissivity in the riding area did not decrease, but rather it tended to increase. Only 2022 shows lower emissivity than 2014. In short, the extent of the dust controls does not appear to correlate with measured emissivity. It is unlikely that the observed decrease in measured emissivity is a secondary effect of decreasing the riding area.
- **Emissivity of non-riding areas.** Figures 2-10 and 2-11 of the Second Draft present average emissivity data for the *riding areas* of the park. It would be informative to also examine how PI-SWERL measurements in non-riding areas change over this time.

In short, using 2013 data for the baseline while using 2019 data for the mitigation scenario results in an artificial emissions reduction “credit” of 16.5 metric tons per day or 9%.¹⁷ The reduction is “artificial” since it does not appear to be the result of any action taken by State Parks to reduce emissions.

To address this issue, the District will require that if the SOA is not amended, then emissions reductions shall be recalculated using 2013 PI-SWERL data for *both* the baseline year and subsequent mitigation scenarios. This will prevent the creation of artificial emissions reductions, while still using 2013 PI-SWERL data for the baseline, as required by the current SOA. The District’s proposed conditional of approval of the ARWP requires this updated modeling to be completed by April 1, 2023, to provide time for the District and the Hearing Board to consider the results.

¹⁶ J.A. Gillies., E. Furtak-Cole, G. Nikolich, V. Etyemezian, “The role of off-highway vehicle activity in augmenting dust emissions at the Oceano Dunes State Vehicular Recreation Area, Oceano, CA,” *Atmospheric Environment: X*, 13 (2022). Available online at <https://doi.org/10.1016/j.aeaoa.2021.100146>.

¹⁷ This is estimate does not include the additional dust control benefit from the seasonal closure of the foredune beach and corridor areas.

The District recognizes that the 2013 emissivity dataset appears to be an outlier. We agree with the Second Draft's conclusion that "the 2019 riding area mean emissivity and shear velocity relationship shown in Figure 2-10 is more similar to 2014, 2015, 2016, and 2022 emissivity conditions and, therefore, better represents the emissivity of the ODSVRA's open riding and camping area in its current state than the emissivity grid of 2013." The SAG also expressed support for this conclusion in Part C of their comments on the Second Draft. Therefore, our preference would be to use 2019 PI-SWERL data (or an average of data from multiple years) for both scenarios; however, this would be inconsistent with the current SOA. Our view is that using 2013 data for both the baseline and mitigation scenarios results in a more accurate accounting of emissions reductions than modeling the scenarios using different datasets.

On the other hand, if the SOA is amended as requested, the requirement to use 2013 PI-SWERL data will be removed. In this case, the proposed conditional of approval of the ARWP simply requires that PI-SWERL data from the same years be used for all modeled scenarios.

For these reasons, the District's Conditional Approval of the ARWP will likely contain the following conditions:

Emissions Reductions Crediting.

- a. *If the SOA is not amended, and the emissions reduction target remains 50% of a 2013 baseline scenario, then State Parks shall calculate progress toward this target using a model that employs 2013 PI-SWERL data for both the baseline and mitigation scenarios, with the exceptions noted below for seasonal closures and the Plover Exclosure. The results of this modeling shall be submitted to the District by April 1, 2023.*
- b. *If the SOA is amended to require reducing emissions to a level consistent with the pre-disturbance scenario identified by the SAG, then the same PI-SWERL dataset(s) used to derive the emissivity grid for the pre-disturbance scenario shall be used to derive the emissivity grid for the mitigation scenario, with the exception noted below for seasonal closures and the Plover Exclosure. If recommended by the SAG, State Parks may recalculate pre-disturbance emissions using different assumptions and/or data than those used by the SAG in their initial recommendation (e.g., 2022 PI-SWERL measurements may be incorporated); however, the same updates must also be applied to the calculation of emissions under the mitigation scenario.*

Modeling of Seasonal Closures

The beach area upwind of the 48-acre foredune and the corridors within it are now being closed seasonally to protect nesting shorebirds. These 27.8 acres are depicted in light blue in Figure 2-1 and brick red in Figure 2-3 in the Second Draft. According to Section 2.2.1.3, under the revised model, these areas are modeled assuming mean non-riding area emissivity. The District does not believe this is appropriate; as noted in our comment letter on the First Draft, "the District supports modeling emissions from this area [using] a weighted average of riding and non-riding area emissions."

The DRI study reported that emissivity decreases by approximately 12% per month when off-roading ceases. Assuming the closure is from March 1 to September 30, the area's emissivity will be about 88% of its pre-closure level by April, and 75% by May, when winds are typically strongest. October also experiences high winds and frequent exceedances of the California PM₁₀ standard, but the area will be re-opened to off-riding at this time. Thus, it is overly aggressive to model this area assuming mean non-riding area emissivity.

For these reasons, the District's Conditional Approval of the ARWP will likely contain the following condition:

***Seasonal Closures.** Emissions from areas that are seasonally open to off-roading shall be modeled based on the weighted average of the average emissivity of both riding and non-riding areas. Alternatively, emissions may be modeled based on other assumptions recommended by the SAG and approved by the APCO.*

Finally, we note an apparent inconsistency in the Second Draft in the reporting of the emission reductions associated with this season closure. Table 2.9 seems to indicate a 2.1 metric ton per day reduction while Table 2-11 seems to indicate a 3.6 metric ton per day reduction.

Modeling of the Plover Exclosure

The District's comments on the First Draft also noted our concerns with the modeling of the Plover Exclosure. Specifically, in the revised modeling, emissions from this area are estimated under the assumption that emissivity is half of the actual emissivity measured in 2019, and our concern was that this underestimated actual emissions. We therefore asked for additional information about emissions from this area as calculated under various assumptions. The additional information disclosed in the Second Draft adds to our concerns.

As shown in Table 2-17 of Section 2.3.5.1 of the Second Draft, the measured emissivity of this area in 2013 and 2019 was already *less* than mean non-riding area emissivity as measured in 2019.¹⁸ It is unlikely that this area, which was only recently permanently closed, is less than half as emissive as areas that have been closed for longer (in some cases decades), or than the 48-acre foredune project, which was closed in 2019 and then actively revegetated. The SAG expressed similar skepticism in Part E of their comments on the Second Draft: "it is doubtful that, in the absence of other controls, the plover exclosure emissivity is less than half of the mean emissivity of all non-riding areas."

The District recognizes that the decision to model this area under this assumption was based on the results of the DRI study which found that ODSRVA emissions declined by almost 50% over the course of the 2020 COVID-19-related closure. Taking these results and applying them to the permanent closure of this area is potentially problematic for the following reasons:

- 2013 PI-SWERL measurements of the Plover Exclosure were made in August and September, when the area had been already closed for 5 or 6 months. Thus, the emissivity

¹⁸ Technically, Table 2-17 reports estimated emissions rather than emissivity; however, the same meteorology is assumed in each modeling scenario, so it can be inferred that the emissivity trends are the same as the trends in emissions reported in the table.

of area was likely already attenuated to an extent similar to that observed in DRI study. The 2019 PI-SWERL measurements in this area were also conducted after the area had been closed for several months, so its emissivity was likely already attenuated, to some degree, as well. To assume an additional 50% reduction is therefore unrealistic.

- The almost 50% reduction in PM₁₀ emissions reported in the DRI Study,¹⁹ is based on changes in the ratio of total PM₁₀ to total wind power density (TPM₁₀:TWPDP), not on the results of repeated PI-SWERL measurements; however, the emissions grid in the modeling is based on PI-SWERL measurements. While the study makes a strong case for parallel trends in TPM₁₀:TWPDP and PI-SWERL emissivity, the exact relationship between the two is not discussed. Thus, it is premature to assume that the ~50% reduction in TPM₁₀:TWPDP manifests as a 50% reduction PI-SWERL-based emissivity.

Therefore, in future modeling, the emissivity of the Plover Exclosure should be based on actual PI-SWERL measurements made since its closure. Alternatively, non-riding area emissivity may be used; however, it should *not* be modeled under the assumption of 50% of 2019 emissivity. If the post-closure PI-SWERL measurements confirm that actual emissivity is less than mean non-riding area emissivity, then this may have implications for the modeling of the pre-disturbance scenario. This issue is discussed later.

For these reasons, and those discussed in our comments on the First Draft, the District's Conditional Approval of the ARWP will likely contain the following conditions:

Permanent Closure of the Plover Exclosure

- a. If this area, in whole or in part, is reopened to public vehicular access, State Parks shall simultaneously implement APCO-approved dust controls sufficient to offset the resulting increase in emissions.*
- b. When modeling emissions from the permanent closure, the emissivity grid shall be derived from actual PI-SWERL measurements conducted since it was permanently closed. Alternatively, emissions may be modeled based on assumptions recommended by the SAG and approved by the APCO. The APCO does not currently approve the assumption of 50% of 2019 emissivity.*

Consistency in Accounting of Emissions Reductions

As discussed above, a fundamental issue with State Parks' revised modeling approach is the use of different emissivity grids, derived from different PI-SWERL measurement campaigns, for different scenarios. As already mentioned, this can create significant artificial emissions changes when scenarios are compared to calculate emissions changes. Whether the Hearing Board approves changing the emissions reduction target or not, it is imperative that emissions are calculated under consistent assumptions so that the creation of artificial emissions "credits" (or "debits") is avoided.

¹⁹ The DRI study reports an "approximately 12% per month" decline in emissions, which the ARWP reports as an "almost 50%" reduction over 5 months, as $(100\% - 12\%)^5 = 53\%$, or a 47% reduction.

Emissions Crediting Under the Current SOA

When the original SOA was approved, total mass emissions from the ODSVRA riding area were unknown. The District, however, had estimated that off-roading had resulted in PM₁₀ concentrations downwind of the riding area being approximately twice the concentrations downwind of the non-riding area. Therefore, the SOA set a target based on a percentage emissions reduction from a pre-mitigation baseline—namely a 50% reduction from the 2013 levels—rather than requiring State Parks to reduce emissions to an absolute level expressed in terms of metric tons of PM₁₀ per day. See the Appendix from the District’s comment letter on the first draft of the 2020 ARWP for details.²⁰ Later, total mass emissions from the riding area under the 2013 baseline scenario were estimated to be 182.8 metric tons per day. Parks was therefore required to reduce emissions from the ODRVRA by 91.4 metric tons per day. Note that this is not necessarily the same as reducing riding area emissions to 91.4 metric per day, since emissions reductions from projects in non-riding areas can be credited toward the 50% reduction, thus offsetting the reductions needed *from* within the riding area.

If the SOA is not amended, then State Parks will be required to account for emissions reductions using same emissivity grid, derived from 2013 PI-SWERL measurements, for both the baseline and mitigation scenarios. The conditions noted above already ensure this.

Emissions Crediting Under an Amended SOA

In their re-evaluation of the SOA Section 2.c target, the SAG took a different approach from that of the District’s described above. They directly estimated mass emissions from a pre-disturbance scenario using certain assumptions about emissivity and the extent of vegetation. Under this scenario, their estimate of emissions from within the riding area (assuming 2013 boundaries) is 108.4 metric tons per day. Compared to the 2013 baseline emissions scenario, this is 40.7% reduction; however, if baseline emissions were recalculated using different assumptions (e.g., using PI-SWERL measurements from a different year) then the calculated percent reduction would be different, even though the target emissions level would remain 108.4 metric tons per day.

If the Hearing Board approves amending the SOA to incorporate the SAG recommendation, then it will be necessary to calculate emissions from mitigation scenarios using assumptions that are analogous to those used for the pre-disturbance scenario. For example, in the pre-disturbance scenario, areas where riding was prohibited in 2013 were modeled using the same emissivity grid as used in the modeling of the 2013 baseline (“2013 emissivity grid”). Thus, when modeling a mitigation scenario, these same areas must also be modeled using the 2013 emissivity grid, unless they have been revegetated—in which case emissions can be assumed to be insignificant (i.e., zero). If they are occupied by other dust controls (e.g., wind fences) then the emissions should be modeled using the 2013 emissivity grid and then reducing emissions by the control effectiveness specified in Section 2.2.1.3 in the Second Draft.

²⁰ Gary E Willey to Sarah Miggins, “California Department of Parks and Recreation’s August 1, 2020, Oceano Dunes SVRA Draft 2020 Annual Report and Work Plan in Response to Stipulated Order of Abatement Number 17-01,” September 4, 2020. Available online at https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/SLOAPCD%20Comments_2020_Draft%20ARWP_Dated%20Aug%201%202020%20sent%209-4-20.pdf.

Proper accounting of emission changes in riding areas is even more complicated. In the pre-disturbance scenario, areas where riding was allowed in 2013 were modeled using an emissivity grid derived from an average of PI-SWERL measurements from non-riding area made from 2013-2019. Furthermore, a “zonal average” of non-riding area emissivity was applied to account for the observed north-to-south gradient in non-riding area emissivity. (See the SAG recommendation for details). Analogous assumptions must be applied to the modeling of the mitigation scenario.

For example, areas that remain open to riding in the mitigation scenario should also be modeled based on an average of PI-SWERL measurements from 2013-2019, rather than using exclusively 2013 data. Areas open to riding in 2013, but which since have been occupied by dust controls, should be modeled based on the same multi-year average of PI-SWERL emissivity with emissions reduced by the appropriate control effectiveness specified in Section 2.2.1.3 in the Second Draft. Finally, areas open to riding in 2013, but which are now closed but not otherwise mitigated, should be modeled using the same emissivity grid used for the pre-disturbance scenario, i.e., a “zonal average” of non-riding area PI-SWERL data from 2013-2019.

Table 3, below, summarizes these expectations, with the assumption that the modeling of the pre-disturbance scenario remains unchanged. If the modeling of pre-disturbance scenario is updated, then analogous expectations would apply.

Table 3: Proper Accounting of Emissions Changes					
Land use status		Emissivity Assumptions			
Actual 2013 Status	Assumed Pre-disturbance Status	Pre-disturbance	Mitigation Scenario		
			If current status is Riding	If current status is non-riding	If current status is under dust control
Riding	Non-riding	Zonal average of 2013-2019 PI-SWERL data	Average of 2013-2019 PI-SWERL data	Zonal average of 2013-2019 data	2.2.1.3 applied to 2013-2019 data
Non-Riding	Non-riding	2013 PI-SWERL data	N/A no such areas	2013 data	2.2.1.3 applied to 2013 data

As already noted, the District recommends that the emissivity of the post-closure Plover Enclosure be based on actual PI-SWERL measurements completed since its closure. If these post-closure measurements confirm that actual emissivity is less than mean non-riding area emissivity, then the area’s assumed emissivity in the pre-disturbance modeling should be revisited. It is unlikely that the emissivity of the Plover Enclosure today is less than it was in pre-disturbance conditions, therefore emissions from the pre-disturbance scenario should be recalculated using the measured post-closure emissivity for this area.

Care must also be taken when accounting for the benefits of dust controls located in non-riding areas. In previous ARWPs, State Parks has been allowed to put dust controls in non-riding areas and then credit the resulting emissions reductions toward the 50% target. The District is willing to

continue this practice under a revised SOA. However, a challenge is presented by the pre-disturbance model's use 2013 PI-SWERL data for non-riding areas and 2013-2019 data in riding areas. If, as is the case in the riding area, non-riding area PI-SWERL measurements from 2013 are significantly higher than those from in later years, then inflated emission reduction credits may be generated from non-riding area dust controls. This is because reduction credits would be based on a significantly more emissive grid than the riding area emissions "debit" that they are meant to offset.

For these reasons, the District recommends that State Parks and SAG consider re-modeling the pre-disturbance scenario using PI-SWERL data from the same years for all areas—both riding and non-riding—and then use an emissivity grid derived from the same years of data for modeling the mitigation scenario.

Due to these complexities, the District is *not* proposing conditions related to this issue for its approval of the ARWP; however, if the SOA is amended, we will expect this issue to be considered in the next ARWP. The District will not approve a future ARWP that includes apparent artificial emission reductions.

Coordination with the California Coastal Commission

The District is pleased that the ARWP states that "[i]f necessary, State Parks will submit a formal CDP application to the California Coastal Commission by November 1, 2022." (Second Draft, Section 3.3.8.) However, we are concerned that California Coastal Commission (CCC) may not approve the 59.0 acres of straw and sterile grain treatment that the Secondary Work Plan proposes for the Plover Exclosure (see Second Draft Section 3.2.2). These treatments may be at odds with the primary purpose of the exclosure, which is to provide habitat for nesting threatened bird species.

We also note that implementation of the 2021 ARWP was delayed by a temporary restraining order that arose from a lawsuit challenging the CCC's authority to permit dust controls related solely to the SOA. The plaintiff alleged that San Luis Obispo County granted consolidated permitting authority to the CCC only for dust controls related to compliance with District Rule 1001 and not specifically for controls related to compliance with the SOA.²¹ As shown Tables 2-12, 2-13, and 3-2 of the Second Draft, the ARWP dust controls are expected to reduce PM₁₀ concentrations at CDF. These controls are too far north to influence concentration near the Oso Flaco monitoring site. Since compliance with Rule 1001 requires a reduction in PM₁₀ levels at CDF, relative to Oso Flaco, the District finds that these ARWP measures will also aid in Rule 1001 compliance. As such, if CCC authorization is needed for any elements of this ARWP, State Parks should indicate in its application that the controls will also aid in Rule 1001 compliance.

For these reasons, the District's Conditional Approval of the ARWP will likely contain the following conditions:

- a. *Certain elements of the ARWP—including but not limited to the Secondary Work Plan's plan to treat 59.0 acres of Plover Exclosure with straw and sterile grain—may require authorization by the California Coastal Commission. For*

²¹ Mackenzie Shuman, "Did 'judicial activism' play role in Oceano Dunes ruling? Off-roading group files appeal," *San Luis Obispo Tribune*, April 20, 2022. Available online at <https://www.sanluisobispo.com/news/local/environment/article260563342.html>.

any element which the Commission declines to authorize, State Parks shall substitute dust controls sufficient to yield an equivalent reduction in emissions. Any such alternative treatment shall be selected in consultation with the SAG and the District and be installed according to the same timeline proposed for the original treatment (i.e., the area must be fenced by March 31 and treatment completed by April 15).

- b. If a Coastal Development Permit amendment application is submitted to the California Coastal Commission, it shall note that the District has found that any dust control measures to be authorized under the permit amendment will aid in the compliance with District Rule 1001 as well as with the SOA. This requirement may be waived with the approval of the APCO.*

Other Elements of the SOA Amendment

In addition to the modifications noted above, which are incorporated in Sections 1 – 3 of the proposed SOA amendment, the proposed amendment also makes several minor adjustments to the SOA. These are described below.

Section 4 provides for continued maintenance of the SAG, allows for membership changes, and provides for the selection of a Chair and Vice-Chair.

The CCC is not a party to the SOA, so Section 5 removes Section 4.l.iii, which defines the role and responsibility of the agency vis-à-vis ARWPs. The removed section states:

California Coastal Commission – Review and approve proposed annual Work Plans before any mitigation may commence for each year, pursuant to Special Condition 2 of Coastal Development Permit 3-12-050, for proposed mitigation within the scope of that permit; and issue new or amended Coastal Development Permits for any work not within the scope of Coastal Development Permit 3-12-050.

Section 6 and 7 requires State Parks to continue to prepare ARWPs during the extended term of the revised SOA. These sections specify that these ARWPs shall be designed to meet the revised goals discussed earlier, and that the review and approval process shall be the same as for the 2020 – 2022 ARWPs. They also extend the Hearing Board’s authority to receive updates on these additional ARWPs and to adjudicate disputes between the parties.

Section 8 clarifies the types of expenses for which the District may seek reimbursement from State Parks.

The final two sections are standard language specifying that all other provisions of the original SOA and the first amendment remain in effect. If there is a conflict between this amendment and the original SOA and/or the first amendment, the terms of this amendment prevail.

Attachment: Proposed Conditions of Final Approval for the 2022 Annual Report and Work Plan.

Emissions Reductions Crediting.

- a. *If the SOA is not amended and the emissions reduction target remains 50% of a 2013 baseline scenario, then State Parks shall calculate progress toward this target using a model that employs 2013 PI-SWERL data for both the baseline and mitigation scenarios, with the exceptions noted below for seasonal closures and the Plover Exclosure. The results of this modeling shall be submitted to the District by April 1, 2023.*
- b. *If the SOA is amended to require reducing emissions to a level consistent with the pre-disturbance scenario identified by the SAG, then the same PI-SWERL dataset(s) used to derive the emissivity grid for the pre-disturbance scenario shall be used to derive the emissivity grid for the mitigation scenario, with the exception noted below for seasonal closures and the Plover Exclosure. If recommended by the SAG, State Parks may recalculate pre-disturbance emissions using different assumptions and/or data than those used by the SAG in their initial recommendation (e.g., 2022 PI-SWERL measurements may be incorporated); however, the same updates must also be applied to the calculation of emissions under the mitigation scenario.*

Seasonal Closures.

- c. *Emissions from areas that are seasonally open to off-roading shall be modeled based on the weighted average of the average emissivity of both riding and non-riding areas. Alternatively, emissions may be modeled based on other assumptions recommended by the SAG and approved by the APCO.*

Permanent Closure of the Plover Exclosure.

- d. *If this area, in whole or in part, is reopened to public vehicular access, State Parks shall simultaneously implement District-approved dust controls sufficient to offset the resulting increase in emissions.*
- e. *When modeling emissions from the permanent closure, the emissivity grid shall be derived from actual PI-SWERL measurement conducted since it was permanently closed. Alternatively, emissions may be modeled based on assumptions recommended by the SAG and approved by the APCO. The APCO does not currently approve the assumption of 50% of 2019 emissivity.*

Coordination with Coastal Commission.

- f. *Certain elements of the ARWP—including but not limited to the Secondary Work Plan's plan to treat 59.0 acres of Plover Exclosure with straw and sterile grain—may require authorization by the California Coastal Commission. For any element which the Commission declines to authorize, State Parks shall*

substitute dust controls sufficient to yield an equivalent reduction in emissions. Any such alternative treatment shall be selected in consultation with the SAG and the District and be installed according to the same timeline proposed for the original treatment (i.e., the area must be fenced by March 31 and treatment completed by April 15).

- g. If a Coastal Development Permit amendment application is submitted to the California Coastal Commission, it shall note that the District has found that any dust control measures to be authorized under the permit amendment will aid in the compliance with District Rule 1001 as well as with the SOA. This requirement may be waived with the approval of the APCO.*