
**Oceano Dunes State Vehicular Recreation Area
Particulate Matter Reduction Plan**

2019 Annual Report and Work Plan

FIRST DRAFT

August 1, 2019



**State of California
Department of Parks and Recreation
Off-Highway Motor Vehicle Recreation Division**

THIS PAGE INTENTIONALLY LEFT BLANK.

**Oceano Dunes SVRA
Particulate Matter Reduction Plan
2019 Annual Report and Work Plan (FIRST DRAFT)**

Table of Contents

1 INTRODUCTION..... 1-1

2 ANNUAL REPORT 2-1

2.1 Dust Controls Implemented Over the Previous Year 2-1

2.1.1 Straw Bale Projects..... 2-1

2.1.2 Vegetation Projects 2-2

2.1.3 Wind Fencing Projects 2-3

2.1.4 Trackout Control Projects..... 2-4

2.2 Monitoring Activities Conducted Over the Previous Year 2-4

2.2.1 Saltation/Sand Flux Monitoring 2-5

2.2.2 Air Quality / PM₁₀ Monitoring 2-5

2.2.3 Meteorological Monitoring 2-6

2.2.4 PI-SWERL Monitoring 2-6

2.2.5 LIDAR Monitoring 2-7

2.3 Other Relevant Actions Completed..... 2-7

2.3.1 California Environmental Quality Act (CEQA) 2-7

3 WORK PLAN..... 3-1

3.1 Dust Control Actions Proposed for the Next Year..... 3-1

3.1.1 Complete Contracting and Procurement 3-1

3.1.2 Establish On-Site Project Manager / Oceano Dunes District Superintendent..... 3-2

3.1.3 Convert Wind Fencing to Vegetation 3-3

3.1.4 Maintain Existing Wind Fencing That Will Not Be Converted to Vegetation..... 3-4

3.1.5 Begin Development of Vegetated Foredune..... 3-5

3.1.6 Refine PMRP Model Through Monitoring Activities 3-7

3.1.7 Determine Baseline Approach..... 3-7

3.2 Expected Outcomes, Effectiveness, and Potential Emissions Reductions 3-8

3.2.1 Conversion of Existing Wind Fencing to Native Dune Vegetation 3-8

3.2.2 Installation of the Vegetated Foredune 3-9

3.3 Sensitivity Analysis 3-10

4 BUDGETARY CONSIDERATIONS 4-1

5 DETAILED IMPLEMENTATION SCHEDULE 5-1

List of Tables

Table 3-1: Contracting and Procurement Actions, Status and Metrics 3-2

Table 3-2: On-Site Project Manager/District Superintendent Actions, Status, and Metrics..... 3-3

Table 3-3: Convert Wind Fencing To Vegetation Actions, Status, and Metrics..... 3-4

Table 3-4: Maintain Existing Wind Fencing Actions, Status, and Metrics 3-5

Table 3-5: Vegetated Foredune Actions, Status, and Metrics 3-6

Table 3-6: PMRP Model Update and Monitoring Actions, Status, and Metrics 3-7

Table 3-7: SOA Baseline Update Actions, Status, and Metrics 3-8

Table 4-1: Estimated 2019 Work Plan Budget 4-1

Table 5-1 2019/2020 Contracting and Procurement Schedule 5-1

Table 5-2 2019/2020 On-Site Project Manager/District Superintendent Schedule..... 5-2

Table 5-3 2019/2020 Convert Wind Fencing to Vegetation Schedule 5-2

Table 5-4 2019/2020 Wind Fencing Maintenance Schedule..... 5-3

Table 5-5 2019/2020 Vegetated Foredune Schedule 5-3

Table 5-6 2019/2020 PMRP Model Update and Monitoring Schedule 5-4

Table 5-7 2019/2020 SOA Baseline Update Schedule 5-4

List of Exhibits

- Exhibit 1: SOA Dust Control Measures
- Exhibit 2: 2018/19 Supplemental Restoration Dust Control Project
- Exhibit 3: Example 2018 Wind Fencing Photographs
- Exhibit 4: Pier Avenue Trackout Mat
- Exhibit 5: Example Monitoring Equipment
- Exhibit 6: 2019 Work Plan Meteorological Monitoring
- Exhibit 7: 2019/20 SOA Dust Control Vegetation Projects
- Exhibit 8: 2019/20 SOA Dust Control Project
- Exhibit 9: 2019/2020 SOA Foredune Installation

2019 Annual Report and Work Plan Attachments (Separate Documents)

- Attachment 1: Restoration 2018-19 Project Summary
- Attachment 2: 2019 Vegetation Projects Planting List

LIST OF ACRONYMS, ABBREVIATIONS, AND SYMBOLS

Acronym / Symbol	Full Phrase or Description
APCO	Air Pollution Control Officer
BSNE	Big Springs Number Eight
CAAQS	California Ambient Air Quality Standards
CCC	California Coastal Commission
CDP	Coastal Development Permit
CDPR	California Department of Parks and Recreation
CEQA	California Environmental Quality Act
DRI	Desert Research Institute
E-BAM	Environmental Beta Attenuation Mass
h	height
Kg	Kilogram
LIDAR	Light Detection and Ranging
LSPDM	Lagrangian Stochastic Particle Dispersion Model
m	Meters
m ³	Cubic Meters
m/s	Meters per Second
OHMVR	Off-Highway Motor Vehicle Recreation
PI-SWERL [®]	Portable In-Situ Wind Erosion Laboratory
PMRP	Particulate Matter Reduction Plan
PM ₁₀	Coarse Particulate Matter
S	Second
SAG	Scientific Advisory Group
SLO	San Luis Obispo
SLOAPCD	San Luis Obispo County Air Pollution Control District
SOA	Stipulated Order of Abatement
SODAR	Sonic Detection and Ranging
SVRA	State Vehicular Recreation Area
µg	Micrograms
µm	Microns / Micrometers
\$	U.S. Dollar
%	Percent

THIS PAGE INTENTIONALLY LEFT BLANK.

1 INTRODUCTION

The California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division (OHMVR Division), has prepared this 2019 Annual Report and Work Plan for the Oceano Dunes State Vehicular Recreation Area (Oceano Dunes SVRA) Draft Particulate Matter Reduction Plan (PMRP) to comply with Condition 4 of the Stipulated Order of Abatement (SOA) approved by the San Luis Obispo County Air Pollution Control District (SLOAPCD) Hearing Board in April 2018 (Case No. 17-01).

SOA Condition 4 requires the OHMVR Division to prepare and submit to the SLOAPCD and the Oceano Dunes SVRA PMRP Scientific Advisory Group (SAG) an Annual Report and Work Plan by August 1 of each year from 2019 to 2022. In general, SOA Condition 4 requires the Annual Report and Work Plan to:

- Review dust control activities implemented over the previous 12-month period and, using tracking metrics specified in the PMRP, document progress towards SOA goals.
- Identify dust control activities proposed to be undertaken or completed in the next 12 month period and, using tracking metrics specified in the PMRP, document expected outcomes and potential emission reductions for these activities.
- Using air quality modeling, estimate the downwind benefits and anticipated reductions in PM₁₀ concentrations associated with proposed dust control activities.
- Describe the budgetary considerations for development and implementation for proposed dust control activities.
- Provide a detailed implementation schedule with deadlines associated with the physical deployment of proposed dust control actions.

The 2019 Annual Report and Work Plan represents the OHMVR Division's initial compliance documentation pertaining to the implementation of the Draft PMRP. The 2019 Annual Report and Work Plan reflects the best information currently available to the OHMVR Division, the SLOAPCD, and the SAG; however, as described in greater detail throughout this document, the

OHMVR Division and the SAG conducted significant data collection campaigns during the Spring and Summer of 2019 that will refine and revise the information presented in this document once this data has been analyzed by the OHMVR Division, the SAG, and the SLOAPCD as described in this document.

2 ANNUAL REPORT

2.1 Dust Controls Implemented Over the Previous Year

From Summer 2018 to July 31, 2019, the OHMVR Division installed 36.1 acres of straw bale projects, 41.9 acres of vegetation projects, and 48.6 acres of wind fencing projects. Straw bales installed at Oceano Dunes SVRA can support vegetation plantings and, therefore, the OHMVR Division has converted all 36.1 acres of straw bale projects installed over the past year to vegetation.

The dust control measures implemented by the OHMVR Division over the past year are summarized below and shown on Exhibit 1, SOA Dust Control Measures.

2.1.1 Straw Bale Projects

In Summer 2018, the OHMVR Division installed approximately 5,100 straw bales on 36.1 acres of land. The straw bale projects consisted of standard straw bales oriented perpendicular to the prevailing, sand-transporting wind direction and spaced approximately every 16.4 feet (5 meters) (depending on topography).

The straw bale projects were installed in two different areas as described below and shown on Exhibit 1:

- **BBQ Flats:** The OHMVR Division installed approximately 3,630 straw bales on approximately 27 acres of land adjacent to the BBQ Flats vegetation islands (within the SVRA's open riding and camping area).
- **Eucalyptus North:** The OHMVR Division installed approximately 1,360 straw bales on approximately 9.1 acres of land adjacent to the Eucalyptus North vegetation island (within the SVRA's open riding and camping area).

The straw bale project locations were established by the SOA and informed by 1930's-era aerial photography that shows the vegetation that existed prior to the State of California operating a beach camping and dune recreation area.

Pursuant to SOA Condition 1.b., the straw bales are to remain in place and be maintained until such time as they are replaced by vegetation or the APCO approves alternate mitigation measures. In the Fall and Winter of 2018/2019, the OHMVR Division broke up the straw bales and spread them throughout the treatment areas to prepare the site for native plant installation (described in Section 2.1.2 below).

2.1.2 Vegetation Projects

From Summer 2018 to July 31, 2019, the OHMVR Division treated a total of 41.9 acres of land with native plants, native seed, straw, fertilizer, and sterile grass seed. In total, the OHMVR Division installed more than 106,000 locally-collected native dune plants and almost 450 pounds of locally-collected native dune seed in the four project areas described below and shown on Exhibit 1:

- **BBQ Flats:** The OHMVR Division planted vegetation on approximately 27 acres of land adjacent to the BBQ Flats vegetation island (within the SVRA's open riding and camping area). This vegetation project replaced the straw bales the OHMVR Division installed pursuant to SOA Condition 1.a in Summer 2018 (see Section 2.1.1).
- **Eucalyptus North:** The OHMVR Division planted vegetation on approximately 8.6 acres of land adjacent to the Eucalyptus North vegetation island (within the Oceano Dunes SVRA open riding and camping area). This vegetation project also replaced the straw bales OHMVR Division installed pursuant to SOA Condition 1.a in Summer 2018 (see Section 2.1.1).
- **Heather, Acacia, and Cottonwood (Paw Print):** The OHMVR Division planted vegetation on approximately 5.2 acres of land adjacent to the Heather, Acacia, and Cottonwood vegetation islands, which are sometimes collectively referred to as the "paw print" (within the SVRA's open riding and camping area). This vegetation project enhanced and supplemented a prior restoration project undertaken by the OHMVR Division in 2017/2018 (i.e., the vegetation was planted on 5.2 acres of land within an existing restoration area approximately 9.3 acres in size; see Exhibit 2, 2018/2019 Supplemental Dust Control Restoration Project).

- **LaGrille Hill:** The OHMVR Division planted vegetation on approximately 2.8 acres of land adjacent to the LaGrille Hill vegetation island (inside the SVRA's open riding and camping area). This vegetation project also enhanced and supplemented a prior restoration project undertaken by the OHMVR Division in 2017/2018 (i.e., the vegetation was planted on 2.8 acres of land within an existing restoration area approximately 9.1 acres in size).

A summary of all treatments, plants per acre, seed per acre, and a list of plant species used in each vegetation project described above is included as Attachment 1.

2.1.3 Wind Fencing Projects

From Summer 2018 to July 31, 2019, the OHMVR Division installed approximately 45,281 feet (13,801.6 meters) of linear feet of wind fencing on approximately 48.6 acres of land. The wind fencing projects consisted of an array of four-foot-high wind fencing rows, oriented perpendicular to the prevailing, sand-transporting wind direction and spaced approximately seven times the fence height (or approximately 28 feet apart (8.5 meters), depending on topography; see Exhibit 3, Example 2018 Wind Fence Photographs). The wind fencing projects were installed in four different areas as described below and shown on Exhibit 1.

- **Heather, Acacia, and Cottonwood (Paw Print):** The OHMVR Division installed two wind fencing arrays on approximately 35.2 acres of land adjacent to the Heather, Acacia, and Cottonwood vegetation islands.
- **Eucalyptus Tree and Eucalyptus South:** The OHMVR Division installed wind fencing arrays on approximately 7.9 acres of land adjacent to the Eucalyptus Tree and Eucalyptus South vegetation islands.
- **Humpback, Table Top, Caterpillar Hill:** The OHMVR Division installed wind fencing arrays on approximately 5.5 acres of land adjacent to the Humpback, Table Top, Caterpillar Hill vegetation islands.

Like the straw bale projects described in Section 2.1.1, wind fencing project locations were established by the SOA and informed by 1930's-era aerial photography. Pursuant to SOA

Condition 1.b., the wind fencing projects are to remain in place and be maintained until such time as they are replaced by vegetation or the APCO approves alternate mitigation measures. By April 2019, approximately 30% of the wind fencing installed the previous summer had deteriorated, requiring maintenance activities including resetting the fence posts, repairing damaged sections, replacing or repairing the orange construction fencing, and general maintenance and upkeep.

2.1.4 Trackout Control Projects

Pursuant to SOA Condition 1.c, the OHMVR Division is required to install an APCO-approved trackout control device at the Grand Avenue and Pier Avenue entrances to Oceano Dunes SVRA in the City of Grover Beach and the unincorporated community of Oceano, respectively, by June 30, 2019.

In May 2019, the OHMVR Division installed two temporary trackout mats at the Pier Avenue exit (see Exhibit 4, Pier Avenue Trackout Mat). The mats abate track out onto public streets from vehicles exiting the park. The temporary mats are removed at least once per week and all accumulated sand is removed from the street and disposed at an approved facility.

In addition to the new trackout mats, the OHMVR Division increased its program of street sweeping Grand and Pier Avenues a minimum of five times per week. The OHMVR Division also contracts with a private sweeping firm to cover a portion of Pier Avenue a minimum of two days per week from Air Park Drive to the State Park boundary. This sweeping complements the work that San Luis Obispo County conducts on Pier Avenue.

2.2 Monitoring Activities Conducted Over the Previous Year

From Summer 2018 to July 31, 2019, the OHMVR Division conducted various sand flux, air quality, meteorological, and other monitoring to evaluate the effectiveness of installed dust control measures and/or provide necessary additional information, as identified in Draft PMRP Chapter 3. These activities are described below.

2.2.1 Saltation/Sand Flux Monitoring

During the 2018 season, Big Springs Number Eight (BSNE) sand flux instruments were installed in two areas (see Exhibit 5, Example Monitoring Equipment):

- 64 instruments were operated in the approximately 37.7 acre-area comprised of the 2018 wind fencing project adjacent to the Heather, Acacia, and Cottonwood vegetation islands (Paw Print) and a vegetation planting project installed in this area prior to 2018.
- 48 instruments were operated in in a 10-acre wind fence array installed prior to 2018.

For both arrays, the average reduction in sand flux in the main portion of the array after the initial adjustment region near the upwind edge of the array was 94%. In the case of the 37.7 acre fence array, the initial adjustment region required 8% of the array (so that the main portion represents 92% of the array), whereas for the 10 acre fence array the adjustment region required 17% of the array (83% in main portion).

During the 2019 wind season 76 BSNE sand flux instruments were installed in three zones:

- 20 instruments in the 25.3-acre Barbeque Flats vegetation project.
- 22 instruments in the 7.9-acre wind fence array adjacent to the Eucalyptus Tree and Eucalyptus South vegetation islands.
- 34 instruments in the wind fence array adjacent to the Heather, Acacia, and Cottonwood vegetation islands (Paw Print).

Through July 15, 2019, sand flux has been measured during 20 wind events during the 2019 season and will be analyzed in a similar manner to the work previously done at the site. DRI is anticipated to analyze the sand flux data by the end of 2019.

2.2.2 Air Quality / PM₁₀ Monitoring

PM₁₀ samplers placed upwind and downwind of the 37.7 acre wind fence array and vegetation projects adjacent to Heather, Acacia, and Cottonwood vegetation islands (Paw Print) show that for periods where PM₁₀ exceed the California Ambient Air Quality Standard of 50 micrograms

per cubic meter ($\mu\text{g}/\text{m}^3$), which suggest active emissions are occurring in the dunes, the percent reduction between upwind and downwind samplers is 54% (see Exhibit 5). This change indicates that emission of PM_{10} from within the wind fence array was low to perhaps zero. Although the concentration change cannot be used to directly quantify changes in emission flux, the decrease in concentration suggests that the emission flux within the fence array is less than upwind of the array (otherwise the concentration would continue to increase as more dust is input into the air mass as it passes over the array). Even with zero net emission flux within the array, the dust in the air from upwind sources would cause the concentration at the downwind edge to be elevated.

2.2.3 Meteorological Monitoring

The OHMVR Division installed 15 meteorological and air quality monitoring stations across Oceano Dunes SVRA to help assess individual project effectiveness and update the meteorology used in the DRI emissions model (see Exhibit 6, 2019 Work Plan Meteorological Monitoring). The air quality monitoring will continue through October and will be analyzed in November 2019. Meteorological data will be collected throughout 2019 and 2020 and will be analyzed and incorporated into the DRI model in early 2020.

2.2.4 PI-SWERL Monitoring

DRI deployed Portable In-Situ Wind Erosion Lab (PI-SWERL) instruments over the period May 6 to May 30, 2019. During that time, conditions were favorable for testing on eight days. Three PI-SWERL instruments were operated for a total of approximately 475 (pending final quality assurance checks) valid tests. The overall aims of the effort were to a) update the emissions grid that was obtained based on 2013 testing and that has been used extensively for understanding the dust emissions distributions in riding and non-riding areas, b) to answer specific questions that have arisen regarding the distribution of emissions, such as the length of the transition region between riding area and non-riding area emissions, and c) to identify changes to the emissions distributions that may have been brought about by the installation of various controls since the 2013 PI-SWERL test were conducted. The samples will be analyzed in October

2019 and will be incorporated into the DRI model along with updated meteorology in January 2020.

2.2.5 LIDAR Monitoring

LIDAR monitoring data was collected within the 37.7-acre wind fence project between April 3 and July 17, 2018 to evaluate potential elevation changes within the fence array. The monitoring revealed that within the fence arrays, sand mass accumulated significantly on the leading edges. For the 37.7 acre array the mean accumulated mass was 248 kilograms per square meter (kg/m^2). Interior to the array there was a mean loss of $-78 \text{ kg}/\text{m}^2$, which translates into approximately two inches (-0.05 meters) in elevation change.

2.3 Other Relevant Actions Completed

2.3.1 California Environmental Quality Act (CEQA)

On March 23, 2017, the OHMVR Division certified the Program Environmental Impact Report (EIR) and adopted a Mitigation Monitoring and Reporting Program for the Oceano Dunes SVRA Dust Control Program. Since then, the OHMVR Division has coordinated with the San Luis Obispo County Air Pollution Control District and the California Air Resources Board to develop the June 2019 Particulate Matter Reduction Plan (PMRP) for controlling dust emissions at Oceano Dunes SVRA. The June 2019 PMRP would modify the Dust Control Program evaluated in the 2017 Program EIR and may result in new significant environmental effects and/or substantially more severe environmental effects that were not identified in the 2017 Program EIR. Accordingly, the OHMVR Division is undertaking a Subsequent EIR.

On June 13, 2019, the OHMVR Division issued a Notice of Preparation (NOP) of a Subsequent EIR. The NOP is the first step in the EIR process of evaluating the potential environmental impacts associated with implementation of the Draft PMRP. The OHMVR Division anticipates the EIR process will conclude by the end of 2019.

THIS PAGE INTENTIONALLY LEFT BLANK.

3 WORK PLAN

3.1 Dust Control Actions Proposed for the Next Year

For the time period from approximately August 1, 2019 to July 31, 2020, the OHMVR Division is proposing to undertake and/or complete the following dust control activities:

- Complete necessary dust control-related contracting and procurement requirements.
- Establish on-site project manager/Oceano Dunes District Superintendent.
- Convert approximately 20 acres of wind fencing to vegetation.
- Maintain remaining wind fencing project areas.
- Begin development of an approximately 23-acre vegetated foredune.
- Continue to refine the DRI Lagrangian Stochastic Particle Dispersion Model (LSPDM) through robust and ongoing monitoring activities.
- Conduct baseline analysis and determine appropriate baseline approach for meeting SOA air quality objectives.

These actions are briefly summarized below. Each summary includes a table that identifies the main implementing actions, whether the action is underway or would be undertaken, and what preliminary evaluation metrics are anticipated to be collected and reported over the coming year. The evaluation metrics listed in this Chapter are based on the 19 Outcome Metrics and 45 Implementation Metrics contained in Draft PMRP Attachment 8. The Draft PMRP identifies that specific targets should be established for each implementation and outcome metrics. The OHMVR Division will coordinate with the SAG and the SLOAPCD on the development of these targets over the coming year.

3.1.1 Complete Contracting and Procurement

The OHMVR Division anticipates the proposed dust control actions will require contracting and procurement of labor and materials. The OHMVR Division anticipates contracts for labor and materials will occur through the next year as necessary to support dust control actions. Table

3-1 summarizes the main implementing actions, work plan status, and reportable metrics for this dust control-related contracting and procurement actions.

Table 3-1: Contracting and Procurement Actions, Status and Metrics						
<i>Implementing Action, Task, and/or Requirement</i>	<i>2019 Work Plan Status</i>					<i>Evaluation Metrics and/or Success Criteria To Document In 2020 Annual Report</i>
	<i>Already Complete</i>	<i>Already Underway</i>	<i>To Be Undertaken</i>	<i>To Be Completed</i>	<i>Not Proposed</i>	
SAG contracting	X					Number of Contracts (I43) ^(A)
Air quality and/or meteorological equipment					X	Number of Contracts (I43)
Plant propagation services, facilities, and/or materials		X	X	X		Number of Contracts (I43)
Contract labor resources, including planting services and environmental reviews (e.g., CEQA)	X		X	X		Number of Contracts (I43)
(A) The Draft PMRP also includes Implementing Metrics I6, I22, I25, I34, I38, I42, and I43 that are related to budgets for contracting and procurement services. See Chapter 4 for 2019 Work Plan budget considerations.						

3.1.2 Establish On-Site Project Manager / Oceano Dunes District Superintendent

The OHMVR Division is currently recruiting to permanently fill the on-site project manager / Oceano Dunes District Superintendent vacancy. Table 3-2 summarizes the main implementing actions, work plan status, and reportable metrics for actions related to establishing an on-site project manager/Oceano Dunes District Superintendent.

<i>Implementing Action, Task, and/or Requirement</i>	<i>2019 Work Plan Status</i>					<i>Evaluation Metrics and/or Success Criteria To Document In 2020 Annual Report</i>
	<i>Already Complete</i>	<i>Already Underway</i>	<i>To Be Undertaken</i>	<i>To Be Completed</i>	<i>Not Proposed</i>	
Job Posting	X					NA
Recruitment		X		X		NA
Interviews/Hiring			X	X		Number of Applicants (144)
Training			X	X		Hired on-site manager (145)

3.1.3 Convert Wind Fencing to Vegetation

Consistent with SOA Condition 1.b., the OHMVR Division proposes to convert approximately 20 acres of the 48.6 acres of wind fencing installed in Summer 2018. The area proposed for the initial conversion from wind fencing to vegetation is located on the western edge of the approximately 35.2-acre wind fence array located adjacent to the Paw Print vegetation island (see Exhibit 7, 2019/20 SOA Dust Control Vegetation Projects, and Exhibit 8, 2019/20 SOA Dust Control Project). Following removal of the existing wind fencing, the OHMVR Division will proceed with restoration of the approximately 20-acre project area. The OHMVR Division's restoration methods are fully described in Chapters 6 and 7 of the June 2019 Draft PMRP.

The OHMVR Division has prepared a planting palette with targets for container stock and native seed needed for dust control projects over the next year (see Attachment 2). The OHMVR Division estimates a total of 96,000 native dune plants and 900 pounds of native dune seed are needed for proposed 2019/20 vegetation planting projects.¹ Table 3-3 summarizes the main implementing actions, work plan status, and reportable metrics for actions necessary to convert existing wind fencing to vegetation.

¹ This total includes vegetation need to convert wind fencing, begin development of the proposed foredune (see Section 3.1.5), and supplemental plantings anticipated to be required at 2018/2019 restoration project areas (Barbeque Flats and North Eucalyptus; see Section 2.1.2).

<i>Implementing Action, Task, and/or Requirement</i>	<i>2019 Work Plan Status</i>					<i>Evaluation Metrics and/or Success Criteria To Document In 2020 Annual Report</i>
	<i>Already Complete</i>	<i>Already Underway</i>	<i>To Be Undertaken</i>	<i>To Be Completed</i>	<i>Not Proposed</i>	
Install perimeter fencing around treatment area (as necessary)			X	X		NA
Native seed collection and/or native plant cultivation		X	X	X		Quantities of seed (I23) Numbers of plants (I24)
Wind fence removal			X	X		Length of fencing removed (I18, I19)
Vegetation planting/restoration			X			Acres planted (I7, I8, I9) Quantity of mulch/fertilizer (I10) Annual plant survival rate (O3) Increase in area covered by live plants (O4)
Monitoring activities			X			Plant inspection/viability monitoring (I13) Acres replanted (I11, I12) Saltation monitoring (I26, I27) Remote Sensing (I37) PM ₁₀ emissions reductions (O1)

3.1.4 Maintain Existing Wind Fencing That Will Not Be Converted to Vegetation

Consistent with SOA Condition 1.b., the OHMVR Division proposes to maintain approximately 28.6 acres of wind fencing installed in Summer 2018 that will not be converted to vegetation by July 31, 2020 (see Exhibit 7). Maintenance activities would include replacing fence posts, fencing materials, and potentially installing new fence rows to maintain historical design control values for wind fencing arrays (greater than 80% to 90% control in the center of the array). Table 3-4 summarizes the main implementing actions, work plan status, and reportable metrics for actions necessary to maintain existing wind fencing that will not be converted to vegetation.

<i>Implementing Action, Task, and/or Requirement</i>	<i>2019 Work Plan Status</i>					<i>Evaluation Metrics and/or Success Criteria To Document In 2020 Annual Report</i>
	<i>Already Complete</i>	<i>Already Underway</i>	<i>To Be Undertaken</i>	<i>To Be Completed</i>	<i>Not Proposed</i>	
Install perimeter fencing around treatment area (as necessary)			X	X		NA
Replace posts, fencing materials, and fence rows as needed			X	X		Length of wind fencing installed and fence spacing (I18, I19, I20) Area stabilized by fencing (I14) Fraction of wind fence profile areas above sand surface (I17)
Monitoring activities			X			Saltation monitoring (I26, I27) Remote Sensing (I37) PM ₁₀ emissions reductions (O1)

3.1.5 Begin Development of Vegetated Foredune

The OHMVR Division will begin development of an approximately 23 acre vegetated foredune just beyond the tidal zone (see Exhibit 9, 2019/2020 SOA Foredune Installation). This process will start by enclosing planting areas with perimeter fencing. The areas closed off will not be continuous, but it will have gaps that allow the public to pass from the camping area to the west to the riding area to the east. In addition, existing infrastructure near the foredune development area (most notably the vault toilet buildings) will remain open to service vehicles and the public. If possible, paths of travel would follow the prevailing wind pattern to reduce long-term maintenance needs on the protective fencing. Following installation of the perimeter fencing and receipt of all necessary environmental approvals, the OHMVR Division will proceed with development of the approximately 23-acre foredune project, which will take several years to monitor and successfully complete. The OHMVR Division's foredune development methods are fully described in Chapters 6 and 7 of the Draft PMRP. Table 3-5

summarizes the main implementing actions, work plan status, and reportable metrics for actions necessary to develop a vegetated foredune.

<i>Implementing Action, Task, and/or Requirement</i>	<i>2019 Work Plan Status</i>					<i>Evaluation Metrics and/or Success Criteria To Document In 2020 Annual Report</i>
	<i>Already Complete</i>	<i>Already Underway</i>	<i>To Be Undertaken</i>	<i>To Be Completed</i>	<i>Not Proposed</i>	
CEQA/Permitting		X		X		Certified Environmental Impact Report California Coastal Commission approval
Install perimeter fencing around treatment area (as necessary)			X	X		NA
Native seed collection and/or native plant cultivation		X	X	X		Quantities of seed (I23) Numbers of plants (I24)
Vegetation planting/restoration			X			Acres planted (I1, I2, I3, I4) Quantity of mulch/fertilizer (I10) Annual plant survival rate (O3) Increase in area covered by live plants (O4)
Monitoring activities			X			Plant inspection/viability monitoring (I5) Change in fraction of plant cover (O5) Change in foredune sand volume (O6) Change in hummocks and topographical variability (O9, O10) Increase in silhouette profile (O12) Saltation monitoring (I26, I27, O11, O17, O18, O19) Remote Sensing (I35, I36, I37) PISWERL emissivity (O8) PM ₁₀ emissions reductions (O1) Meteorological Monitoring (O7)

3.1.6 Refine PMRP Model Through Monitoring Activities

The OHMVR Division will continue to work with the SAG and the SLOAPCD to address reducible uncertainties and refine the DRI LSPDM presented in Chapter 3 of the Draft PMRP. This will involve the continuation of the monitoring activities described in Chapter 2, data analyses, and updating the DRI LSPDM model inputs to reflect new meteorological, air quality, and other data collection efforts. Table 3-6 summarizes the main implementing actions, work plan status, and reportable metrics for actions necessary to update the PMRP model through modeling results.

<i>Implementing Action, Task, and/or Requirement</i>	<i>2019 Work Plan Status</i>					<i>Evaluation Metrics and/or Success Criteria To Document In 2020 Annual Report</i>
	<i>Already Complete</i>	<i>Already Underway</i>	<i>To Be Undertaken</i>	<i>To Be Completed</i>	<i>Not Proposed</i>	
Monitoring activities	X	X	X			Saltation monitoring (I26, I27, O17, O18, O19) Remote Sensing (I37) PISWERL emissivity (I39, I40, I41) PM ₁₀ emissions reductions (O1) Meteorological Monitoring (I28, I29, I30, I31, I32, I33)
Update PMRP Model			X	X		Updated baseline modeling information and emission reduction estimates

3.1.7 Determine Baseline Approach

The OHMVR Division will continue to work with the SAG and the SLOAPCD to determine the correct baseline approach for meeting SOA objectives (see Draft PMRP Chapter 4). Table 3-7 summarizes the main implementing actions, work plan status, and reportable metrics for actions necessary to update the SOA baseline approach.

<i>Implementing Action, Task, and/or Requirement</i>	<i>2019 Work Plan Status</i>					<i>Evaluation Metrics and/or Success Criteria To Document In 2020 Annual Report</i>
	<i>Already Complete</i>	<i>Already Underway</i>	<i>To Be Undertaken</i>	<i>To Be Completed</i>	<i>Not Proposed</i>	
Monitoring activities	X	X	X			Saltation monitoring (I26, I27, O17, O18, O19) Remote Sensing (I37) PISWERL emissivity (I39, I40, I41) PM ₁₀ emissions reductions (O1) Meteorological Monitoring (I28, I29, I30, I31, I32, I33)
Update PMRP Model			X	X		Updated baseline modeling information and emission reduction estimates

3.2 Expected Outcomes, Effectiveness, and Potential Emissions Reductions

The proposed dust control measures identified in Section 3.1 are intended to reduce dust emissions downwind of Oceano Dunes SVRA. The estimated emission reductions and effectiveness of the dust control measures on downwind PM₁₀ concentrations, based on air quality modeling conducted by DRI, are discussed in greater detail in this section.

It is important to note the information below is based on the DRI LSPDM results as presented in the June 2019 Draft PMRP. As described in Section 2.2, the OHMVR Division has pursued significant data collection campaigns in Spring and Summer of 2019 that will update the information below once the analyses of the new data is complete.

3.2.1 Conversion of Existing Wind Fencing to Native Dune Vegetation

Although the analysis contained in the Draft PMRP did not specifically evaluate the potential mass reduction in PM₁₀ emissions associated with the conversion of approximately 20 acres of existing wind fencing to native dune vegetation, some potential outcomes may be inferred from the information contained in the PMRP. As provided in Section 6.2.2 of the Draft PMRP, the effectiveness of wind fencing varies from 40% to 86% depending on the location

measured, the spacing of the fencing, and depth of the fencing. The fencing that would be replaced by vegetation generally has a control efficiency of 94% when operating under optimal conditions (see Section 2.2.1). The establishment of a continuous cover of vegetation or materials, such as broadcast straw or mulch, on a sand surface should effectively reduce sand transport and the emissions of dust associated with the sand movement to zero, providing a control effectiveness of 100%. After scaling the emission reductions identified in Table 5-8 of the PMRP for the Initial SOA control to 20 acres, and assuming the controls are working at a minimum 83% efficiency (based on 2018 sand flux monitoring, see Section 2.2.1), it is estimated the installation of vegetation could help reduce existing emissions by approximately 0.53 tons per day under a 100% control efficiency (which may not be achieved until vegetation is fully grown). Assuming the same scaling factor for downwind PM₁₀ concentrations measured at CDF, this level of control could reduce measured PM₁₀ concentrations at the CDF monitoring station by approximately -0.2 µg/m³ (based on the modeled days where the PM₁₀ CAAQS standard was exceeded) to -0.4 µg/m³ (based on the modeling results for May 22, 2013).

3.2.2 Installation of the Vegetated Fore-dune

As shown in Table 5-8 of the PMRP, installation of the vegetated fore-dune is estimated to reduce 24-hour PM₁₀ baseline emissions on May 22, 2013 by approximately 5.2 metric tons per day. This reduction, after accounting for the reductions attributable to the Pre- and Initial-SOA control measures, corresponds to approximately 2.9% mass PM₁₀ reduction based on emissions from the entirety of Oceano Dunes SVRA, and an approximately 3.9% mass PM₁₀ reduction based on emissions from the SVRA's open riding and camping area. Based on the values contained in Table 5-9 of the PMRP, this level of control is estimated to reduce measured PM₁₀ concentrations at the CDF monitoring station by approximately -8.3 µg/m³ (based on the 10 highest modeled emission days) to -20.7 µg/m³ (based on the modeled days where the PM₁₀ CAAQS standard was exceeded).²

² As identified in Table 4-2 of the PMRP, the modeling timeframe is from May 1, 2013 to August 1, 2013.

3.3 Sensitivity Analysis

As described in Section 2.2, the OHMVR Division has completed or is in the progress of completing several significant data collection campaigns in Spring and Summer of 2019 that will update Draft PMRP modeling. The sensitivity analysis will need to rely on this new data currently being collected and analyzed, so it will be included in subsequent submissions.

4 BUDGETARY CONSIDERATIONS

The OHMVR Division's estimated budget to develop and implement the 2019/2020 dust control actions described in Chapter 3 is \$2,642,230. A detailed breakdown of this estimated budget is provided in Table 4-1.

Table 4-1: Estimated 2019 Work Plan Budget			
Dust Control Activity	3rd Party Contract Costs	Other Costs	Total Costs
Vegetation Plantings (Conversion of Wind Fencing, Foredune, and Supplemental Plantings)			
Support Services	\$343,000	\$0	\$343,000
Labor	\$257,000	\$104,000	\$361,000
Materials	\$0	\$95,000	\$95,000
Equipment	\$97,000	\$125,000	\$222,000
Greenhouse Facilities	\$150,000	\$0	\$150,000
<i>Subtotals</i>	<i>\$847,000</i>	<i>\$324,000</i>	<i>\$1,171,000</i>
Maintenance of Wind Fencing			
Labor	\$156,000	\$18,000	\$174,000
Materials	\$0	\$50,000	\$50,000
Equipment	\$100,000	\$0	\$100,000
<i>Subtotals</i>	<i>\$256,000</i>	<i>\$68,000</i>	<i>\$324,000</i>
Monitoring (Sand Flux, Air Quality, Meteorological, and Other Monitoring)			
Instrument Operations	\$229,000	\$29,000	\$258,000
Data Analysis	\$300,000	\$0	\$300,000
<i>Subtotals</i>	<i>\$529,000</i>	<i>\$29,000</i>	<i>\$558,000</i>
Dust Control Project Design and Technical Assistance			
Scientific Expertise	\$368,000	\$0	\$368,000
<i>Subtotals</i>	<i>\$368,000</i>	<i>\$0</i>	<i>\$368,000</i>
Other Items of Expense			
Miscellaneous	\$221,230	\$0	\$221,230
<i>Subtotals</i>	<i>\$221,230</i>	<i>\$0</i>	<i>\$221,230</i>
TOTAL COSTS	\$2,221,230	\$421,000	\$2,642,230
Note: Cost estimate does not include permanent staff positions assigned to these duties but does include seasonal staff time and overtime for permanent staff.			

The approximately \$2.64 million budget shown in Table 4-1 is similar to the costs the OHMVR Division incurred from Summer 2018 to July 31, 2019. Compared to the previous 12 months:

- Costs for greenhouse services (to grown native plants) have increased at off-site growing facilities (private facilities and Cal Poly San Luis Obispo facilities)
- Labor costs have increased to install native dune plants and restoration materials;
- Contract costs for scientific and technical assistance for additional field investigations (PI-SWERL, air quality monitoring) and scientific analysis (DRI LSPDM, analysis of new field measurements, etc.).

Costs for greenhouse services and labor to install plants have increased primarily due to the increase in the amount of planting projects at Oceano Dunes SVRA. Prior to the 2018/19 restoration season, the OHMVR Division had planted a maximum of approximately 20 acres of vegetation per year for dust control purposes. In 2018/19 and again in 2019/20, the OHMVR Division planted approximately 40 acres of native dune vegetation. This additional acreage represents a large increase in the labor required to grow out plants, prepare restoration sites for plant and seed material, and install plants.

5 IMPLEMENTATION SCHEDULE

Draft PMRP Attachment 9 presents an overall implementation schedule for the PMRP. The tables below present updated schedules for implementing the dust control activities identified in Chapter 3 over the August 1, 2019 to July 31, 2020 time period.

Table 5-1 2019/2020 Contracting and Procurement Schedule														
<i>Implementing Action, Task, or Requirement</i>	<i>Task Start Date</i>	<i>Task End Date</i>	<i>2019/2020 Implementation Schedule</i>											
			<i>Aug '19</i>	<i>Sep '19</i>	<i>Oct '19</i>	<i>Nov '19</i>	<i>Dec '19</i>	<i>Jan '20</i>	<i>Feb '20</i>	<i>Mar '20</i>	<i>Apr '20</i>	<i>May '20</i>	<i>Jun '20</i>	<i>Jul '20</i>
SAG Contracting	Dec '18	Apr '19												
Air quality and/or meteorological equipment	Mar '19	Sep '19												
Plant propagation services, facilities, and/or materials	Apr '19	May '23												
Contract labor resources, including planting services and environmental reviews (e.g., CEQA)	Jun '19	Aug '19												
Table Key:														
	Action start.													
	Action in progress.													
	Action complete.													

Implementing Action, Task, or Requirement	Task Start Date	Task End Date	2019/2020 Implementation Schedule													
			Aug '19	Sep '19	Oct '19	Nov '19	Dec '19	Jan '20	Feb '20	Mar '20	Apr '20	May '20	Jun '20	Jul '20		
Job Posting	Dec '18	Mar '19														
Recruitment	Jan '19	Nov '19														
Interviews/Hiring	Oct '19	Dec '19														
Training	Dec '19	May '20														
Table Key:																
	Action start.															
	Action in progress.															
	Action complete.															

Implementing Action, Task, or Requirement	Task Start Date	Task End Date	2019/2020 Implementation Schedule													
			Aug '19	Sep '19	Oct '19	Nov '19	Dec '19	Jan '20	Feb '20	Mar '20	Apr '20	May '20	Jun '20	Jul '20		
Install perimeter fencing around treatment area (as necessary)	Aug '19	Oct '20														
Native seed collection and/or native plant cultivation	Jan '19	Nov '20														
Wind fence removal	Aug '19	Oct '20														
Straw bales/mulch	Oct '19	Nov '20														
Vegetation planting/restoration	Jul '19	Feb '20														
Monitoring activities	Jan '20	Dec '23														
Table Key:																
	Action start.															
	Action in progress.															
	Action complete.															

Table 5-4 2019/2020 Wind Fencing Maintenance Schedule

Implementing Action, Task, or Requirement	Task Start Date	Task End Date	2019/2020 Implementation Schedule														
			Aug '19	Sep '19	Oct '19	Nov '19	Dec '19	Jan '20	Feb '20	Mar '20	Apr '20	May '20	Jun '20	Jul '20			
Install perimeter fencing around treatment area (as necessary)	Jan '20	Mar '20															
Replace posts, fencing materials, and fence rows as needed	Feb '20	Mar '20															
Monitoring activities	Feb '20	TBD															
Table Key:																	

Table 5-5 2019/2020 Vegetated Foredune Schedule

Implementing Action, Task, or Requirement	Task Start Date	Task End Date	2019/2020 Implementation Schedule														
			Aug '19	Sep '19	Oct '19	Nov '19	Dec '19	Jan '20	Feb '20	Mar '20	Apr '20	May '20	Jun '20	Jul '20			
CEQA	Jun '19	Dec '19															
CCC Approval	Dec '19	TBD															
Install perimeter fencing around treatment area	Dec '19	Dec '19															
Native seed collection and/or plant cultivation	Apr '19	Feb '20															
Vegetation planting	Jan '20	Mar '20															
Monitoring activities	Jan '20	Dec '23															
Table Key:																	

Table 5-6 2019/2020 PMRP Model Update and Monitoring Schedule

Implementing Action, Task, or Requirement	Task Start Date	Task End Date	2019/2020 Implementation Schedule													
			Aug '19	Sep '19	Oct '19	Nov '19	Dec '19	Jan '20	Feb '20	Mar '20	Apr '20	May '20	Jun '20	Jul '20		
Meteorological and PM data acquisition	May-19	Dec-23														
PI-SWERL measurements	May-19	Jun-23														
PI-SWERL analyses	Jul-19	Oct-23														
DEM update	TBD	TBD														
Incorporate DEM update into LSPDM	Oct-19	Dec-22														
Updated LSPDM modeling	Dec-19	Mar-23														
Compare model predictions with PM data measurements	Dec-19	Mar-23														
Improve LSPDM performance	Jun-19	Dec-23														
Table Key:																
	Action start.															
	Action in progress.															
	Action complete.															

Table 5-7 2019/2020 SOA Baseline Update Schedule

Implementing Action, Task, or Requirement	Task Start Date	Task End Date	2019/2020 Implementation Schedule													
			Aug '19	Sep '19	Oct '19	Nov '19	Dec '19	Jan '20	Feb '20	Mar '20	Apr '20	May '20	Jun '20	Jul '20		
Review available field and modeling data	May '19	Mar '20														
Develop alternative SOA baseline options	Jan '20	Mar '20														
Recommend baseline approach to State	Feb '20	Mar '20														
Table Key:																
	Action start.															
	Action in progress.															
	Action complete.															

**Oceano Dunes SVRA Draft PMRP
2019 Annual Report and Work Plan (First Draft)**

EXHIBITS

- Exhibit 1: SOA Dust Control Measures**
- Exhibit 2: 2018/19 Supplemental Restoration Dust Control Project**
- Exhibit 3: Example 2018 Wind Fencing Photographs**
- Exhibit 4: Pier Avenue Trackout Mat**
- Exhibit 5: Example Monitoring Equipment**
- Exhibit 6: 2019 Work Plan Meteorological Monitoring**
- Exhibit 7: 2019/20 SOA Dust Control Vegetation Projects**
- Exhibit 8: 2019/20 SOA Dust Control Project**
- Exhibit 9: 2019/2020 SOA Foredune Installation**

THIS PAGE INTENTIONALLY LEFT BLANK.

**Oceano Dunes SVRA Draft PMRP
2019 Annual Report and Work Plan (First Draft)**

ATTACHMENT 1

Restoration 2018-19 Project Summary

THIS PAGE INTENTIONALLY LEFT BLANK.

Restoration 2018-19 Project Summary

Site	BBQ Flats	Eucalyptus North	LaGrille Hill	Pawprint	
Site Description	New Site	New Site	Supplemented	Supplemented	
Site Established	2018-19	2018-19	2017-18	2017-18	
Total Area Planted					Total
Total Area (acre)	25.30	8.56	2.84	5.17	41.87
Total Native Plant Count	72,126.00	22,856.00	5,445.00	5,924.00	106,351.00
Plants /Acre	2,850.83	2,670.09	1,917.25	1,145.84	2,540.03
Number of Plants by Species					
<i>Achillea millefolium</i>	9,215	3,234	748	748	13,945
<i>Acmispon glaber</i>	472	184	0	0	656
<i>Ambrosia chamissonis</i>	644	0	0	0	644
<i>Astragalus nuttallii</i>	0	0	0	98	98
<i>Atriplex leucophylla</i>	147	0	0	0	147
<i>Camissoniopsis chieranthifolia</i>	547	0	0	0	547
<i>Corethrogyne filaginiflora</i>	1,813	662	150	248	2,873
<i>Dudleya lanceolata</i>	35	56	0	0	91
<i>Ericameria ericoides</i>	2,513	868	207	207	3,795
<i>Erigeron blochmaniae</i>	5,047	1,774	416	416	7,653
<i>Eriogonum parvifolium</i>	2,352	824	194	194	3,564
<i>Eriophyllum staechadifolium</i>	12,365	3,817	867	867	17,916
<i>Erysimum insulare</i>	4,729	1,675	591	990	7,985
<i>Fragaria chiloensis</i>	9	0	18	0	27
<i>Lupinus chamissonis</i>	21,835	7,098	1,667	1,667	32,267
<i>Monardella crispera</i>	3,285	1,024	262	262	4,833
<i>Oenothera elata</i>	1,225	0	0	0	1,225
<i>Phacelia ramosissima</i>	441	174	0	0	615
<i>Salix lasiolepis</i>	160	67	0	0	227
<i>Senecio blochmaniae</i>	5,292	1,399	325	325	7,341
Total Area Covered with Straw					Total
Total Area (acre)	25.30	8.56	0.00	0.00	33.86
Total Bales	3,634.00	1,356.00	0.00	0.00	4,990.00
Total Bales/Acre	143.64	158.41	0.00	0.00	147.37
Straw Hand Scattered					
Area (acre)	25.24	7.45	0.00	0.00	32.69
Bales	3,589.00	1,302.00	0.00	0.00	4,891.00
Bales/Acre	142.22	174.77	0.00	0.00	149.64
Straw Hand Punched					
Area (acre)	1.07	1.07	0.00	0.00	2.13
Bales	45.00	54.00	0.00	0.00	99.00
Bales/Acre	42.17	50.61	0.00	0.00	46.39

Restoration 2018-19 Project Summary

Site	BBQ Flats	Eucalyptus North	LaGrille Hill	Pawprint	
Total Area Seeded					Total
Total Area (acre)	25.30	8.56	2.84	5.17	41.87
Area (%)	60.43%	20.44%	6.78%	12.35%	100.00%
Native Seed Weight (lb)	360.37	65.53	9.07	12.96	447.93
Native Seed (lb) /Acre	14.24	7.66	3.19	2.51	10.70
Native Seed Weight (g)	163,463.83	29,724.41	4,114.15	5,878.66	203,181.05
Native Seed (g) /Acre	6,461.02	3,472.48	1,448.65	1,137.07	4,852.66
Fertilizer 15-15-15 (lb)	1,500.00	600.00	100.00	100.00	2,300.00
Fertilizer 15-15-15 (lb) /Acre	59.29	70.09	35.21	19.34	54.00
Sterile Triticale (lb)	1,600.00	600.00	100.00	100.00	2,400.00
Sterile Triticale(lb) /Acre	63.24	70.09	35.21	19.34	57.00
Seed Weight (lb) by Species					
<i>Abronia maritima</i>	77.98	0.00	0.00	0.00	77.98
<i>Abronia umbellata</i>	0.34	0.12	0.02	0.03	0.51
<i>Acmispon glaber</i>	24.48	8.35	1.15	1.78	35.76
<i>Achillea millefolium</i>	15.56	5.31	0.73	1.19	22.79
<i>Ambrosia Chamissonis</i>	112.80	0.00	0.00	0.00	112.80
<i>Astragalus Nuttalli</i>	0.05	0.02	0.00	0.01	0.08
<i>Atriplex leucophylla</i>	0.07	0.00	0.00	0.00	0.07
<i>Baccharis pilularis</i>	0.50	0.17	0.02	0.04	0.73
<i>Camissoniopsis chieranthifolia</i>	0.62	0.00	0.00	0.00	0.62
<i>Corethrogyne filaginifolia</i>	0.21	8.00	1.10	0.09	9.40
<i>Erigeron blochmaniae</i>	5.84	1.99	0.27	0.44	8.54
<i>Eriastrum densifolium</i>	0.04	0.03	0.05	0.07	0.19
<i>Ericameria ericoides</i>	31.35	10.70	1.48	2.32	45.85
<i>Erysimum insulare</i>	0.37	0.13	0.02	0.02	0.54
<i>Eriogonum parvifolium</i>	34.26	11.69	1.61	2.56	50.12
<i>Eriophyllum staechadifolium</i>	13.76	4.69	0.65	1.01	20.11
<i>Juncus lesueurii</i>	0.43	0.15	0.02	0.03	0.63
<i>Lupinus chamissonis</i>	5.60	1.91	0.26	1.25	9.02
<i>Malacothrix incana</i>	0.15	0.00	0.00	0.00	0.15
<i>Monardella crisper</i>	5.84	1.99	0.27	0.49	8.59
<i>Phacelia ramosissima</i>	19.67	6.71	0.93	1.47	28.78
<i>Senecio blochmaniae</i>	10.45	3.57	0.49	0.16	14.67
fore dune mix	191.62	0.00	0.00	0.00	191.62
back dune mix	168.75	65.53	9.07	12.96	256.31
ACMI Duff	24.91	8.50	1.17	1.76	36.34
ASNU Duff	0.15	0.05	0.01	0.01	0.22
CACH Duff	3.89	1.33	0.18	0.27	5.67
ERIN Duff	0.66	0.23	0.03	0.05	0.97
ERST Duff	15.76	5.38	0.74	1.11	22.99
LUCH Duff	122.34	41.74	5.76	8.64	178.48

**Oceano Dunes SVRA Draft PMRP
2019 Annual Report and Work Plan (First Draft)**

ATTACHMENT 2

2019 Vegetation Projects Planting List

THIS PAGE INTENTIONALLY LEFT BLANK.

Restoration 2019-20 Plant Propagation Summary

Species		Plant Species Counts		Seed Collected Onsite	Propagate	
Mid-Dune Scrub Species		APCD Mid-Dune Site (20 acres)	APCD Foredune Site (22 acres)	Seed (lbs)	Type	Total to Propagate
22 species	Total:	68000	7700	624.5 lbs		75700
<i>Abronia latifolia</i>	ABLA	75	50	5	unclean	125
<i>Abronia umbellata</i>	ABUM	75	50	5	unclean	125
<i>Acmispon glaber</i>	ACGL	3400	-	75	unclean	3400
<i>Achillea millefolium</i>	ACMI	5100	-	50	clean	5100
<i>Astragalus nuttallii</i>	ASNU	175	-	1	clean	175
<i>Baccharis pilularis</i>	BAPI	175	-	5	fluff	175
<i>Carex sp.</i>	CA??	75	-	-	-	75
<i>Corethrogyne filaginifolia</i>	COFI	4250	-	20	fluff	4250
<i>Dudleya lanceolata</i>	DULA	75	-	0.5	clean	75
<i>Erigeron blochmaniae</i>	ERBL	4250	-	25	fluff	4250
<i>Ericameria ericoides</i>	ERER	4250	1000	75	fluff	5250
<i>Erysimum insulare</i>	ERIN	5000	-	10	clean	5000
<i>Eriogonum parvifolium</i>	ERPA	5000	1000	100	semi-clean	6000
<i>Eriophyllum staechadifolium</i>	ERST	9300	5000	50	clean	14300
<i>Juncus lescurii</i>	JULE	175	-	2	clean	175
<i>Lupinus chamissonis</i>	LUCH	13600	300	50	clean	13900
<i>Monardella undulata ssp crispera</i>	MOCR	5000	-	50	unclean	5000
<i>Myrica californica</i>	MYCA	75	100	-	-	175
<i>Phacelia ramosissima</i>	PHRA	1700	-	50	semi-clean	1700
<i>Ribes sp.</i>	RI??	175	-	-	-	175
<i>Senecio blochmaniae</i>	SEBL	5900	-	50	fluff	5900
<i>Solidago spathulata</i>	SOSP	175	200	1	fluff	375
Foredune Scrub Species		APCD Mid-Dune Site (20 acres)	APCD Foredune Site (22 acres)	Seed (lbs)	Type	Total to Propagate
5 species	Total:	-	20900	281 lbs		20900
<i>Abronia maritima</i>	ABMA	-	300	125	unclean	300
<i>Ambrosia chamissonis</i>	AMCH	-	8000	150	unclean	8000
<i>Atriplex leucophylla</i>	ATLE	-	300	2	clean	300
<i>Camissoniopsis cheiranthifolia</i>	CACH	-	9500	2	clean	9500
<i>Malacothrix incana</i>	MAIN	-	2800	2	fluff	2800
27 species	TOTAL:	68000	28600	905.5 lbs		96600