Oceano Dunes State Vehicular Recreation Area

Draft Monitoring Site Selection Plan

February 28, 2012

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

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1. Introduction

The California Department of Parks and Recreation (CDPR), Off-Highway Motor Vehicle Recreation Division (the OHMVR Division) submits this Oceano Dunes State Vehicular Recreation Area (Oceano Dunes SVRA) Draft Monitoring Site Selection Plan (Draft MSSP) for consideration and approval by the Air Pollution Control Officer (APCO) of the San Luis Obispo (SLO) County Air Pollution Control District (APCD), in accordance with Section F.1.a of APCD Rule 1001, Coastal Dunes Dust Control Requirements.

1.1 Background

On November 16, 2011, the SLO County APCD Board of Directors adopted Rule 1001, Coastal Dunes Dust Control Requirements, which requires the operator of a coastal dune vehicle activity area (CDVAA) greater than 100 acres in size to prepare and implement a Particulate Matter Reduction Plan (PMRP) to minimize emissions of PM10 for the area under its control. Rule 1001 defines the term CDVAA as "any area within 1.5 miles of the mean high tide line where public access to coastal dunes is allowed for vehicle activity." Oceano Dunes SVRA is the only area with location and size that meets the applicability criteria defined in Section A.1 of Rule 1001. For ease of reference, APCD Rule 1001 is contained in Appendix A of this MSSP.

Rule 1001 specifies development of a PMRP as the primary mechanism for minimizing PM10 emissions; an integral component of the PMRP is the siting and operation of APCO-approved federal equivalent method (FEM) Control and CDVAA PM10 monitors that measure the 24-hour average PM10 concentrations directly downwind of areas where vehicle activity is and is not permitted. Rule 1001 implicitly recognizes the challenge in siting and operating comparable non-riding and riding area monitors by first requiring the OHMVR Division to develop an MSSP and implement a short-term Temporary Baseline Monitoring Program (TBMP) before implementing the long-term PMRP monitoring program. Table 1 chronologically lists the requirements of Rule 1001 to which the OHMVR Division, as operator of Oceano Dunes SVRA, is subject.

Table 1 – Rule 1001 Compliance Timeline

Compliance Timeline	Rule Requirement
February 28, 2012	Submit Draft MSSP
May 31, 2012	Submit Draft PMRP
November 30, 2012	Submit permit applications for PMRP projects
February 28, 2013	Begin Temporary Baseline Monitoring Program
May 31, 2013	Receive environmental/land use approval for PMRP projects
July 31, 2013	Begin PMRP Monitoring Program, apply for Permit to Operate
May 31, 2015	Apply Performance Standards to PMRP Monitoring Program

1.2 Purpose and Need

In order to be in compliance with Rule 1001, subject to and during the pendency of the Friends of Oceano Dunes Litigation, and unless and until the Court should order otherwise, this Draft

MSSP is submitted for APCD consideration.[1] The purpose of this Draft MSSP is to describe the OHMVR Division's proposed scientific approach, technical methods, criteria, and timeline to evaluate, identify, select, and obtain APCO-approval of Control and CDVAA monitor sites for use in the TBMP and PMRP Monitoring Program that Rule 1001 requires the OHMVR Division to implement downwind of Oceano Dunes SVRA.

This Draft MSSP is needed because the temporary and long term PM10 monitoring sites Rule 1001 requires will be affected by different upwind meteorological and geomorphic conditions and subject to regulatory and other siting and environmental considerations. These conditions and considerations require evaluation in order to make sound, informed decisions regarding the OHMVR Division's selection of appropriate and comparable Control (i.e., "non-riding") and CDVAA (i.e., "riding") PM10 monitoring sites.

1.3 Document Organization

This document is organized as follows:

- ***Section 1.0 Introduction*** provides the purpose and need for this Draft MSSP and the organization of the document.
- ***Section 2.0 Guiding Principles*** describes the guiding principles that the OHMVR Division has adopted as an agency and the relationship of those principles to the PMRP required by Rule 1001.
- ***Section 3.0 Scientific Approach*** describes the upwind non-riding and riding areas subject to monitoring and summarizes the overall approach the OHMVR Division will use to select downwind TBMP and PMRP Control and CDVAA monitor sites.
- ***Section 4.0 Upwind Factors to Evaluate Before Selecting Monitoring Areas*** describes the technical methodology the OHMVR Division will use to evaluate upwind conditions before selecting appropriate downwind monitoring areas.
- ***Section 5.0 Siting Requirements to Address When Selecting Monitoring Sites*** describes the regulatory siting and other practical criteria the OHMVR Division will address when selecting specific monitoring sites.
- ***Section 6.0 Environmental and Land Use Approvals to Consider After Selecting Monitoring Sites*** describes the environmental and other land use permitting approvals that must be obtained in order to install PM10 monitors at or within the vicinity of Oceano Dunes SVRA.
- ***Section 7.0 Site Selection Criteria*** describes how the OHMVR Division will determine the comparability of general downwind monitoring areas and specific downwind monitoring sites.

[1] Rule 1001 is presently subject to litigation pending in San Luis Obispo County Superior Court, Case No. CV120013 (Friends of Oceano Dunes, Inc. v. San Luis Obispo County Air Pollution Control District, et al. [Friends' Litigation].) CDPR is named a real party-in-interest in the Friends' Litigation. Further, CDPR submitted extensive comments and objections to the adoption of Rule 1001, which objections are a part of the administrative record for the adoption of Rule 1001 and which have been incorporated and alleged by reference in the Friends' Litigation. CDPR submits this Draft MSSP subject to the pending Friends' Litigation without express or implied waiver of, and expressly reserving CDPR's rights with regard to: CDPR's objections to Rule 1001 as previously submitted for the record; CDPR's rights to participate as a real party-in-interest in the pending Friends' Litigation: CDPR's rights to raise further objections to Rule 1001 as implemented and enforced by the APCD and its APCO; and any other and further rights it may have with regard to implementation of Rule 1001 by the APCD.

2. Guiding Principles

The OHMVR Division has a legislative mandate to implement and administer a program to manage and enhance off-highway motor vehicle (OHV) recreation uses, and motorized off-highway access to non-motorized recreation (Public Resources Code Sections 5090.01 et seq.).

In 2009, the OHMVR Division completed its Strategic Plan, a road map that describes five guiding principles and adopts a framework of six goals for the OHMVR Program to meet its legislative mandates (OHMVR 2009). The OHMVR Division will adhere to the guiding principles outlined in the Strategic Plan when developing this Draft MSSP, including the principles of sustainability, transparency in decision making, and use of sound data for management decision making. The OHMVR Division will also adhere to the goals of the Strategic Plan when implementing this Draft MSSP, including goals to sustain existing OHV opportunities, establish cooperative relationships, and make informed decisions.

In this regard, this Draft MSSP not only meets the requirements of Rule 1001 but is the mechanism by which the OHMVR Division implements the principles and goals of its Strategic Plan, including Objective 1.5 of the Plan: “By 2014, implement a dust monitoring and management program with the aim of reducing the amount of dust generated by OHVs.”

3. Scientific Approach

The OHMVR Division proposes to identify and evaluate preliminary temporary and long-term Control and CDVAA monitor sites by performing the following series of steps:

1. Define non-riding and riding areas.
2. Evaluate geomorphic and meteorological conditions within non-riding and riding areas.
3. Identify comparable preliminary regions that are representative of PM10 concentrations downwind of non-riding and riding areas.
4. Evaluate preliminary regions for potential locations that are comparable, meet siting criteria, and satisfy technical limitations of monitors.
5. Identify environmental and other land use permit requirements for potential sites.
6. Rank potential monitoring sites based on technical, siting, and permitting criteria.
7. Select and submit sites for APCO approval.

Figure 1, Oceano Dunes SVRA and Vicinity, depicts the areas where vehicle activity is and is not permitted. The SVRA consists of a total of 3,600 acres of managed lands. Approximately 1,500 acres of open sand areas are open to OHV recreation. From March 1st to September 30th of each year, the area open to OHV recreation is reduced to approximately 1,250 acres due to the installation of fencing to protect endangered species.

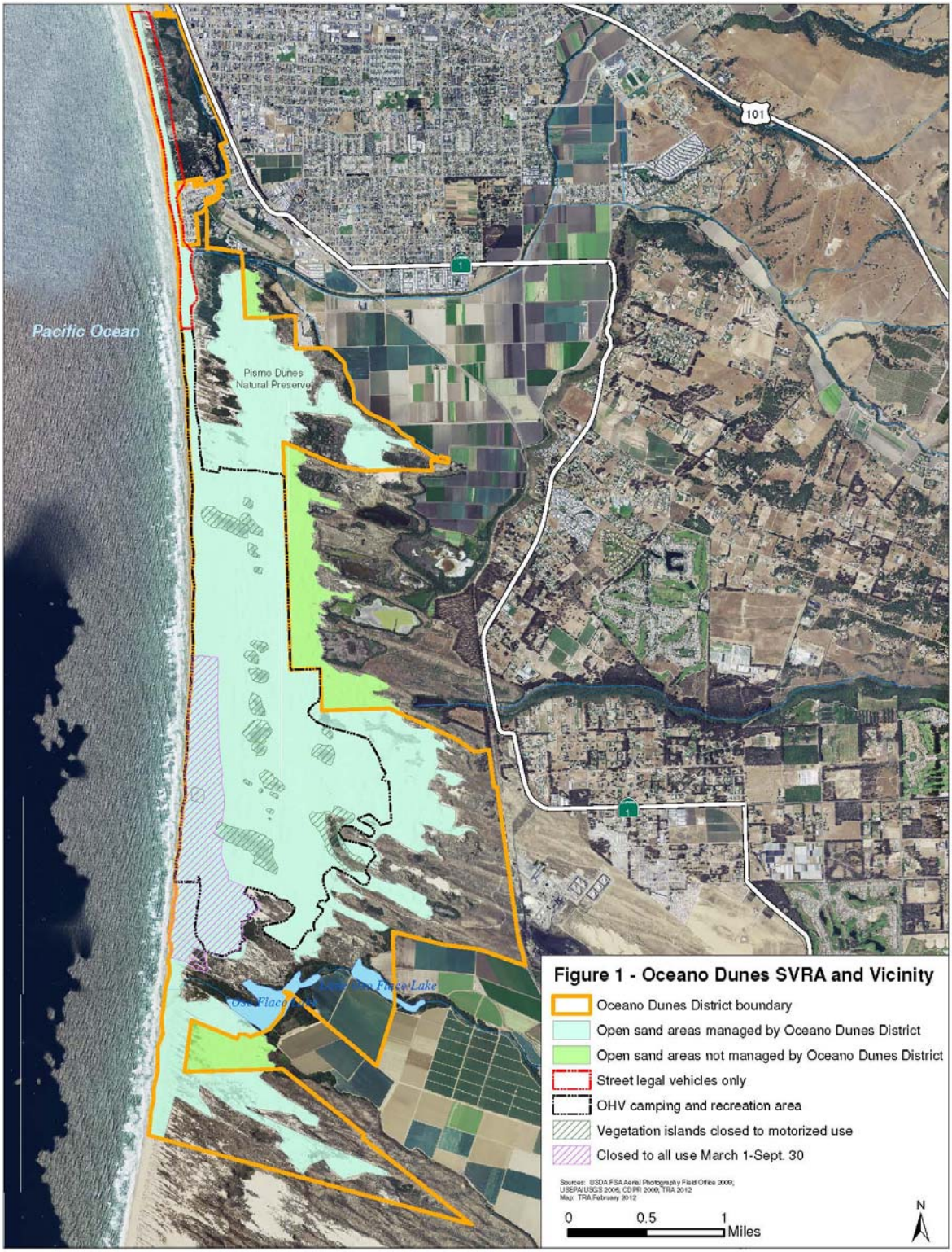
There are three general open sand areas where vehicle activity is not permitted within or near the SVRA. Moving from north to south, the first open sand non-riding area is the Pismo Dunes Natural Preserve (Dunes Preserve). The western and southern boundaries of the Dunes Preserve border the SVRA's riding area. A substantial artificial foredune system, built up with non-native vegetation, exists along the western boundary. The second open sand non-riding area is located behind (to the east) of the riding area. The third open sand non-riding area is in the vicinity of Oso-Flaco Lake, south of the riding area.

In general, Rule 1001 requires the OHMVR Division to install TBMP and PMRP Control and CDVAA monitors downwind of non-riding and riding areas, respectively, in order to measure whether there is an incremental difference in downwind PM10 concentrations resulting from vehicle activity. Thus, it is critical to optimize placement of these monitors to ensure the measurements made by these monitors support the intent of Rule 1001.

The open sand sheets in both the non-riding and riding areas are considered ground-level sources of dust. For such sources, the PM10 concentration measured at a point downwind from the source is generally accepted to be related to: 1) the source (i.e., inherent dust emissivity in the dune sand); 2) strength of the force acting on the source (i.e., the wind); 3) the amount, or fetch, of the upwind source area; and 4) the degree of atmospheric dispersion.

Since upwind non-riding and riding areas are subject to unique geomorphic and meteorological conditions that will influence, to varying extent, the potential amount of PM10 that Control and CDVAA monitors will measure, a plan that aims to quantify only the effect of vehicle activity must, to the extent possible, hold constant as many other parameters as possible in order to isolate the incremental contribution, if any, of vehicle activity to the downwind PM10 concentration.

Figure 1 – Oceano Dunes SVRA and Vicinity



With this general principle in mind, the OHMVR Division proposes to first evaluate the geomorphic and meteorological conditions occurring within upwind non-riding and riding areas by conducting short-term monitoring of wind speed, wind direction, and PM10 concentrations during Spring 2012 along four prevailing wind direction transects (two in the riding area, two in non-riding areas) and to couple this data with an assessment of PM10 emissivity using Desert Research Institute's (DRI) Portable In-Situ Wind Erosion Laboratory (PI-SWERL).

The OHMVR Division, in coordination with the APCD, will analyze the meteorological and PM10 data collected during Spring 2012 to identify trends that may indicate whether a particular downwind region is or is not suitable for Control and CDVAA monitors. For example, if wind speeds are substantially different between the Dunes Preserve and the riding area, it may not be appropriate to place a Control monitor downwind of the Dunes Preserve. The OHMVR Division proposes to augment the Spring 2012 data analysis with the use of dispersion modeling. The modeling is intended to provide a relative understanding of PM10 dispersion downwind of open sand sheets, where Control and CDVAA monitors will ultimately be placed.

Once suitable downwind regions are generally identified, the OHMVR Division will proceed with identifying and evaluating specific Control and CDVAA monitor sites for their ability to support monitors on a logistical level (i.e., power, security, access, etc.), compatibility with applicable siting criteria, and likely environmental and other land use permitting approvals required.

Specific sites will then be ranked by their technical, logistical, and environmental attributes in order to identify sites that are most appropriate for Control and CDVAA monitors.

4. Upwind Factors to Evaluate Before Selecting Monitoring Areas

This section describes the technical methods the OHMVR Division will use to evaluate upwind geomorphic and meteorological conditions within non-riding and riding areas to determine if these conditions are comparable and meet established criteria.

The upwind factors generally recognized by the OHMVR Division and the APCD necessary to consider in the site selection process include:

- **Open Sand Fetch Characteristics:** The size, terrain, and vegetation coverage of an open sand sheet will influence PM10 concentrations at downwind monitoring sites. Generally, the greater the extent of sand fetch that exists upwind of a potential monitoring site, the higher the PM10 concentration that is expected to be measured at the monitoring site, although surface emissivity, wind speed, and dispersion characteristics all work to influence downwind PM10 concentrations as well. Given a long enough fetch and a homogenously emitting surface, the concentration measures at the same height above the surface should come into equilibrium, i.e., it should remain constant (at a specific height) with downwind distance. Ideally, emissions of PM10 (i.e., micrograms emitted per square meter per second, $\mu g\ m^{-2}\ s^{-1}$) would be measured along a transect to provide a more direct measure of the influence of vehicle use on the magnitude of the emissions, as the vertical gradient of PM10 and wind speed would characterize the emissions. Measurements of emission flux, however, are more logistically difficult and expensive to obtain. Quantification of PM10 concentration ($\mu g/m^3$) at multiple locations however, can serve as a proxy measurement of emissions provided that all other factors (e.g., fetch, wind conditions, atmospheric dispersion) can be held approximately constant among the corresponding locations along the different transects.
- **Wind Speed and Prevailing Wind Direction:** Wind is the force that generates saltation (when particles are lifted from the surface, carried by the wind a short distance, and then sink back down to the surface), and PM10 derived from saltation. Consequently, understanding the variability in wind speed as the air mass passes over the dune setting is critical to determining potential variations in PM10 emissions from dune surfaces. At present, the OHMVR Division collects wind speed and wind direction data at its temporary S1 wind tower (See Figure 2, Proposed Temporary Air Monitoring Array), which is located in the foredune region of the riding area.
- **Dune PM10 Emissivity Potential:** The Control and CDVAA monitors will measure PM10 concentrations that emanate from upwind sand sheets and dune surfaces, which may vary in their potential PM10 emissivity. Experts from DRI conducted a small-scale study of non-riding and riding area PM10 emissivity potential in May 2011 using its PI-SWERL device and found there was slight variability in emissivity potential between three different locations in the dunes, on the order of a factor of 1.7 (DRI 2011).

The OHMVR Division proposes to evaluate these conditions by deploying a series of temporary meteorological and PM10 monitoring devices, conducting emissivity trials, and performing dispersion modeling as described below.

4.1 Temporary Meteorological and PM10 Monitoring Program

The OHMVR Division proposes to deploy an array of temporary meteorological and non-FEM PM10 monitoring devices to evaluate meteorological conditions (wind speed/direction, temperature, and relative humidity) and PM10 (aerosol particle counts, mass concentrations) both within and downwind of areas where vehicle activity is and is not permitted. These non-FEM monitors have the practical advantage of collecting high quality data while requiring less power and permitting requirements. These devices are appropriate for the temporary monitoring effort, which is intended to inform the selection of TBMP and PMRP Monitoring Program Control and CDVAA monitor sites. Rule 1001 requires the TBMP and PMRP Monitoring Program to begin February 28, 2013 and July 31, 2013, respectively.

4.1.1 Program Objectives, Schedule, and Monitoring Locations

Figure 2, Proposed Temporary Air Monitoring Array, shows the location of the proposed monitoring equipment. The proposed array consists of four transects situated in the prevailing wind direction (approximately 300 degrees). The northernmost and southernmost transects are located in non-riding areas. The other two transects are located near the center of Oceano Dunes SVRA within the open riding area. In total, the OHMVR Division is proposing up to 17 short term PM10 monitoring locations in order to ensure a robust data set is collected and the impact of any equipment malfunction or potential data loss is minimized.

The primary objective of the temporary PM10 monitoring array is to evaluate differences in PM10 concentrations downwind of non-riding and riding areas. To accomplish this, the OHMVR Division is proposing to deploy up to five portable, Met One environmentally protected beta attenuation mass (E-BAM) PM10 monitors in the vicinity of Oceano Dunes SVRA's eastern boundary, i.e., at the back of the dunes. The secondary objective of the temporary PM10 monitoring array is to evaluate and characterize aerosol PM10 profiles in the prevailing wind direction at specific distances from the shore, both within non-riding and riding areas. To accomplish this, the OHMVR Division is proposing to deploy up to 12 Met One Model 212 Ambient Particulate Profilers (APP) at locations that correspond approximately to fore-, mid-, and back-dune regions of Oceano Dunes SVRA.

The primary objective of the meteorological monitoring is to evaluate meteorological conditions throughout Oceano Dunes SVRA. To accomplish this, the OHMVR Division proposes to deploy wind speed and wind direction sensors as well as temperature and relative humidity devices at or in the vicinity of each proposed temporary PM10 monitoring location, as well as one location specific to meteorological monitoring (O2).

If objectives are met, the OHMVR Division will use this information, in combination with dune emissivity trials and dispersion modeling, to identify appropriate regions, or grids, downwind of Oceano Dunes SVRA that would be generally comparable and thus appropriate for use in siting Control and CDVAA monitors.

Figure 2 – Proposed Temporary Air Monitoring Array

Program Schedule

In order to meet Rule 1001 requirements to implement a TBMP by February 28, 2013, the OHMVR Division proposes to begin conducting its temporary monitoring program during the months that are historically the windiest at Oceano Dunes SVRA – March, April, May, and June. Table 2 shows the proposed schedule of program activities.

Table 2 – Schedule for Temporary Meteorological and PM10 Monitoring Program Activities

Activity	Approximate Schedule[A]
Field-Test APP Monitors[B]	Late March – Early April 2012
Co-Locate APP/E-BAM Monitors[C]	Early – Mid-April 2012, Late June 2012
Conduct Monitoring Program	Early April to Mid-June 2012
Validate and Analyze Data	Early May to Late August 2012

A. Schedule is approximate. The actual schedule for OHMVR deployment and monitoring is dependent on equipment procurement and environmental and land use permitting requirements. The monitoring program may extend beyond June 2012 if there are delays in equipment procurement or permit acquisition.
B. Refers to initial field testing and co-location of single APP/E-BAM monitor to evaluate if the robustness of the APP data collection and the potential relationship between PM10 particle counts and mass concentrations.
C. Refers to co-location of all APP monitors with an E-BAM monitor. Co-location is anticipated to last approximately one week prior to and at the conclusion of monitoring.

E-BAM Monitors and Locations

Figure 2 shows proposed E-BAM monitoring locations E1 through E5; Table 3 below summarizes the proposed E-BAM monitoring array. The OHMVR Division anticipates an inlet height of 4m above ground for this instrument. The technical specifications for the E-BAM measurement system are contained in Appendix B.

Monitors E1, E2, E4, and E5 are all located at the eastern end of the proposed monitoring transects, where the greatest extent of open sand fetch exists in these areas, near the Oceano Dunes SVRA boundary. The intent of monitors E1, E2, E4, and E5 is to evaluate PM10 concentrations along the eastern extent of open sand fetch areas and the Oceano Dunes SVRA boundary. These monitors will provide a coarse evaluation of PM10 concentrations at the downwind boundary of non-riding and riding areas, but will not provide information on how PM10 concentrations change from the fore- to mid- to back-dune regions of Oceano Dunes SVRA. Thus, any differences in PM concentrations between monitors E1, E2, E4, and E5 may be attributable to factors such as meteorological conditions, extent of open sand fetch, or vehicle activity.

Monitor E3 is located within the open sand sheet, in the middle of the riding area. The OHMVR Division's intent for monitor E3 (as well as M1 – M12 described below) is to evaluate if PM10 concentrations are consistent in the middle (monitor E3) and back (monitor E4) of the riding area. Any potential difference between monitor E3 and downwind monitor E4 may be the result of a variety of factors; however, if these other factors (e.g., emissivity, wind speeds) can be determined to be relatively constant or at least can be adjusted for, then the comparison of PM10 concentrations between monitors E3 and E4 may help identify the extent to which saltation-related PM10 varies based on the amount of upwind open sand sheet.

Table 3 – Proposed E-BAM Temporary Monitoring Array

Location	Distance from Shore[B]	Vehicle Activity	Measurements[C]
E1[A]	3,540 ft / 1,080 m	No	PM10 (µg/m^3), WS/WD, Temp., RH
E2	3,275 ft / 1,000 m	Yes	PM10 (µg/m^3), WS/WD, Temp., RH
E3	3,540 ft / 1,080 m	Yes	PM10 (µg/m^3), WS/WD, Temp., RH
E4[A]	7,390 ft / 2,250 m	Yes	PM10 (µg/m^3), WS/WD, Temp., RH
E5	3,220 ft / 980 m	No	PM10 (µg/m^3), WS/WD, Temp., RH

A. Denotes monitor will be co-located with Met One Instruments Model 212-1 Ambient Particulate Profiler (APP) monitor and/or meteorological tower throughout the duration of the monitoring period. It is not necessary to collect meteorological data at each monitor in this area (i.e., meteorological data will be collected at either the meteorological tower or the E-BAM / APP monitor, not at both).
B. Distances are approximate. Actual location and distance will depend on in-field dune conditions.
C. Wind speed and direction measurements would be taken at heights between 2m and 10m.

Met One Ambient Particulate Profiler Monitoring Locations

Figure 2 shows proposed Met One Model 212 APP monitoring locations M1 through M12; Table 4 below summarizes the proposed APP monitoring array. The technical specifications for the APP measurement system are contained in Appendix B.

The APP is capable of measuring suspended particle number concentrations in eight size "bins," seven between 0.3 and 10 microns and the eighth for particles larger than 10 microns. The advantages of this device include a fast response time (seconds), low-maintenance, low power consumption, and it provides measurements in multiple size bins. The APP also has a lower overall footprint, an advantage for environmental permitting. The specific inlet height for this instrument is not prescribed, but the OHMVR Division anticipates intakes would be located at approximately four meters above ground level. Knowledge of particle size distributions can also inform the source of the particles. For example, sea salt aerosol has a modal diameter of approximately 2 µm and mineral dust generated by wind erosion is typically of greater modal diameter.

The OHMVR Division would site monitors M1, M4, M7, and M10 within the foredune region of Oceano Dunes SVRA. The intent of these monitors is to evaluate if the amount of aerosol is consistent at a given height above the surface and distance from the shore within non-riding and riding areas. As Figure 2 shows, vegetated foredunes are located in the immediate vicinity of non-riding area monitors M1 and M10, but are not present near riding area monitors M2 and M3. In addition, monitor M7 is located immediately downwind of the OHMVR Division's seasonal plover exclosure, and provides an opportunity to see what, if any, effect the seasonal exclosure has on PM10 concentrations immediately downwind by comparing data from monitor M4 with M7.

The OHMVR Division would site monitors M2, M5, M8, and M11 within open sand sheets in the middle of non-riding and riding areas. The intent of these monitoring locations is similar to near-shore monitors M1, M4, M7, and M10, as well as monitor E-3, except that the instruments at these locations would also evaluate if the amount of aerosol particles increases or remains constant as the amount of upwind sand fetch increases.

The OHMVR Division would site monitors M3, M6, M9, and M12, at the east end of the four proposed transects, where the greatest extent of open fetch exists. The intent of these monitoring locations is similar to monitors E1, E2, E4, and E5 - to evaluate the horizontal PM10 concentration gradient in the back of the non-riding and riding area. Any potential difference between these monitors and monitors located upwind in the middle of the dunes (monitors M2, M5, M8, M11, E3, and E5) may be the result of a variety of factors; however, if these other factors (e.g., emissivity, wind speeds) can be determined to be relatively constant or at least can be adjusted for, then these back dune monitors may also help identify the extent to which saltation-related PM10 varies based on amount of open sand sheet. The OHMVR Division notes that this evaluation may be limited for monitor M12, which is located in a narrow strip of open sand fetch bordered closely by dune vegetation. This vegetation may increase PM10 deposition or otherwise affect wind speed and PM10 dispersion such that PM10 concentrations may be lower at this location when compared to other back dune monitors. It is also noted that monitors M11 and M12 are located approximately 1,600 feet from agricultural operations, though these operations are not generally located in the prevailing wind direction at Oceano Dunes SVRA.

Table 4 – Proposed APP Temporary Monitoring Array

Location	Distance from Shore[B]	Vehicle Activity	Measurements[C]
M1	1,110 ft / 338 m	No	Particle Counts, WS/WD, Temp., RH
M2	2,375 ft / 724 m	No	Particle Counts, WS/WD, Temp., RH
M3[A]	3,430 ft / 1,046 m	No	Particle Counts, WS/WD, Temp., RH
M4	1,110 ft / 338 m	Yes	Particle Counts, WS/WD, Temp., RH
M5	2,375 ft / 724 m	Yes	Particle Counts, WS/WD, Temp., RH
M6[A]	3,430 / 1,046 m	Yes	Particle Counts, WS/WD, Temp., RH
M7	1,320 ft / 402 m	Yes	Particle Counts, WS/WD, Temp., RH
M8	3,750 ft / 1,143 m	Yes	Particle Counts, WS/WD, Temp., RH
M9[A]	7,920 ft / 2,415 m	Yes	Particle Counts, WS/WD, Temp., RH
M10	1,056 ft / 322 m	No	Particle Counts, WS/WD, Temp., RH
M11[A]	3,590 ft / 1,095 m	No	Particle Counts, WS/WD, Temp., RH
M12	5,280 ft / 1,610 m	No	Particle Counts, WS/WD, Temp., RH

A. Denotes monitor will be co-located with E-BAM monitor and/or meteorological tower throughout the duration of the monitoring period. It is not necessary to collect meteorological data at each monitor in this area (i.e., meteorological data will be collected at either the meteorological tower or the E-BAM / APP monitor, not at both).

B. Distances are approximate. Actual location and distance will depend on in-field dune conditions.

C. Wind speed and direction measurements would be taken at heights between 2m and 10m.

Meteorological Monitoring Locations

The OHMVR Division proposes to monitor wind speed / wind direction, temperature, and relative humidity at each of the APP and E-BAM monitoring locations, as well as meteorological towers P1, S2, O1, and O2 depicted in Figure 2. The OHMVR Division would install one to three anemometers and one wind vane at these locations, using a logarithmic spacing for installation heights of anemometer (approximately two, four, and/or 10 meters above ground level), in

order to estimate friction velocity, a critical parameter for wind erosion processes. Wind speed/direction instruments at each of the APP and E-BAM monitors would consist of a Campbell Scientific Wind Sentry Set or wind speed sensors (manufactured by R.M. Young); wind speed / direction instruments at the meteorological towers would consist of R.M. Young Model 05305 AQ Wind Monitor. The OHMVR Division anticipates that temperature and relative humidity instruments would be obtained from Campbell Scientific.

Potential Monitoring Program Limitations

The OHMVR Division's proposed PM10 monitoring devices, as are all monitoring devices, are subject to operating limitations. The proposed E-BAMs are documented to have operating issues under moist conditions due to its low-power inlet heater. In addition, the OHMVR Division is unaware of any studies documenting the use of APP monitors in a coastal dune setting and can thus not be certain these devices are able to withstand the harsh environment of Oceano Dunes SVRA. Both the E-BAM and APP monitor inlet sampler effectiveness may also be affected by high wind conditions. In addition, the APP monitors may be subject to turbulent and inconsistent inlet flows under high wind conditions that may impact the relationship between particle count data and mass concentration estimates.

The OHMVR Division recognizes the potential for these limitations to reduce the accuracy and validity of the data collected during monitoring and will work the APCD to provide specific ideas on how these issues can be corrected and resolve any concerns regarding quality assurance of monitoring data.

4.1.2 Monitoring Equipment Installation, Operation, and Maintenance

The OHMVR Division proposes to contract with qualified firms to install, operate, and maintain the proposed E-BAMs, APPs, and meteorological monitoring devices.

For E-BAM operation, the OHMVR Division would follow as closely as possible the procedures the APCD has established for operating E-BAM devices in its 2012 Community Particulate Monitoring Project Monitoring Plan (SLO ACPD 2012).

For APP operation, the OHMVR Division would develop a protocol to insure high quality data acquisition. This protocol would be based on the manufacturer's recommended maintenance, periodically testing instrument flow rates, and adjusting as needed. The data collected would be examined on a weekly basis to evaluate the instrument parameters and identify instrument malfunctions.

4.1.3 Program Quality Assurance

The OHMVR Division proposes to co-locate E-BAM and APP devices both prior to and at the conclusion of the monitoring period to evaluate bias between the two instruments.

The OHMVR Division also proposes to concurrently operate one E-BAM and one APP at the same nominal location in each of the four proposed monitoring transects throughout the duration of the monitoring program. The co-location of these monitors will enable the OHMVR Division to evaluate the relationship between the two monitoring methods over a range of wind conditions and PM10 concentrations. If appropriate, this relationship then may be used to

develop a correction factor in order to compare particle counts at upwind APP monitors with mass concentration measurements at E-BAM monitoring locations.

As discussed in Section 4.1.1 above, DRI and the OHMVR Division recognizes that the APP device is unproven in harsh coastal environments and is therefore proposing to initially field-test the suitability of these devices for use in Oceano Dunes SVRA by co-locating and operating a single E-BAM and a single APP device in advance of the planned quality assurance co-location step. If the APP device demonstrates robustness and provides high-quality data over the whole or a subset of the study period, data from the APP can be used to provide high-time resolution profiles of particle counts to complement the one-hour average PM10 measurements provided by the E-BAMs.

4.1.4 Data Processing, Validation, and Analysis

The OHMVR Division will log monitoring data using Campbell Scientific data loggers. The OHMVR Division, assisted by experts from DRI and the APCD, intends to review this data on a regular basis in order to assess whether instruments are operating normally. Once the OHMVR Division has acquired instruments and is ready to proceed with the monitoring program, an in-depth data validation procedure will be prepared.

4.1.5 Other Meteorological and PM10 Monitoring Data

The data collected by the OHMVR Division's proposed monitoring program may be augmented by other meteorological and PM10 monitoring data being collected in the vicinity of Oceano Dunes SVRA, including data from the OHMVR Division's existing S1 tower and APCD's CDF and Mesa 2 monitoring stations. The OHMVR Division fully intends to consider this data in concert with data collected as part of the proposed monitoring program.

In addition, the APCD is currently implementing its 2012 Community Particulate Monitoring Project within Nipomo Mesa and Oceano. This project is using saturation monitoring downwind from the Oceano Dunes SVRA (in approximate 1-mile grids) to map the spatial extent and concentration gradient of PM10 concentrations within these communities. Should data collected by the APCD as part of its 2012 Community Particulate Monitoring Project be available, the OHMVR Division shall also consider this data when defining downwind regions that would be potentially suitable for Control and CDVAA monitors.

4.2 PM10 Emissivity Potential

The Control and CDVAA monitors will measure PM10 concentrations that emanate from upwind sand sheets and dune surfaces that may vary in their potential PM10 emissivity. Experts from DRI conducted a small-scale study of non-riding and riding area PM10 emissivity potential in May 2011 using the PI-SWERL device and found there was slight variability in emissivity potential between three different locations in the dunes on the order of a factor of 1.7 (DRI 2011). To determine if PM10 emissivity varies or remains constant on a broader scale, the OHMVR Division proposes to have DRI conduct PI-SWERL testing in areas upwind of the proposed short-term monitoring stations depicted in Figure 2. The OHMVR Division anticipates this testing will occur during the April - June 2012 timeframe.

4.3 AERMOD Dispersion Modeling

The OHMVR Division has initiated dispersion modeling using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) to facilitate understanding of how PM10 disperses downwind of Oceano Dunes SVRA. Meteorological data from the OHMVR Division's existing S1 met tower has been supplemented with meteorological and upper air data from other monitoring stations and processed for use in the AERMOD model. Due to limitations regarding actual PM10 emission rates from the dunes, the AERMOD dispersion modeling is not intended to predict actual downwind PM10 concentrations. Rather, the OHMVR Division intends for this modeling to provide a relative understanding of the typical plume dispersion characteristics for PM10 emanating from defined upwind dune regions (i.e., riding vs. non-riding areas). If the dispersion characteristics of downwind receptor grids are relatively defined for specific upwind dune regions, the modeling can be used to exclude downwind areas that the temporary monitoring program indicates are affected by incomparable upwind conditions. By relatively defining downwind dispersion characteristics, the modeling may also help define areas that are not suitable for monitoring because they lie within the path of PM10 emanating from both non-riding and riding areas. The OHMVR Division anticipates the AERMOD dispersion modeling will occur during the March to April 2012 timeframe.

4.4 Defining Potential Downwind Monitoring Areas

The OHMVR Division intends for the technical investigations into upwind factors described in Sections 4.1 to 4.3 above to be used to identify areas downwind of Oceano Dunes SVRA that are generally comparable given their upwind factors and thus appropriate for use as TBMP and PMRP Monitoring Program Control and CDVAA monitor areas. The OHMVR Division anticipates this process will first involve development of a receptor grid to the east of Oceano Dunes SVRA. Dispersion modeling would be used to identify the relative contributions of defined dune regions on these receptor grids in order to determine if the grid should be broadly characterized as a potential Control or CDVAA monitoring areas. Dune emissivity and meteorological and PM10 monitoring data collected by the OHMVR Division on the dunes will then be used to determine if the geomorphic and meteorological conditions measured within these defined upwind regions are comparable for Rule 1001 purposes. Once appropriate grids have been identified, the OHMVR Division would proceed with selecting a specific site within this area as described in Section 5 of this Draft MSSP.

The OHMVR Division recognizes that one or more Control and CDVAA sites may be appropriate for inclusion in the TBMP and PMRP Monitoring Programs required by Rule 1001. Alternatively, the data collected by the OHMVR Division and the ACPD's Community Particulate Monitoring Project may indicate that the existing CDF or Mesa2 sites are appropriate for additional Control or CDVAA monitoring. In the event more than one Control and/or CDVAA site is determined appropriate, the OHMVR Division would work with the APCD to develop the methodology used to assess compliance with the 24-hour average PM10 concentration performance standard contained in Rule 1001 (e.g., averaging the daily readings from both monitors, taking the highest of measured averages).

5. Siting Requirements to Address when Selecting Monitoring Sites

Once the OHMVR Division has completed its temporary meteorological and PM10 monitoring and other investigations into upwind factors and identified the general downwind areas that would be appropriate for siting Control and CDVAA monitors, the OHMVR Division will proceed with identifying specific sites where these monitors could potentially be deployed.

The OHMVR Division would install and operate the TBMP and PMRP Control and CDVAA monitors to comply with Rule 1001, not to monitor ambient air quality within SLO County. Thus, the OHMVR Division believes the required Control and CDVAA monitors are special purpose monitors that should not be compared to state and national ambient air quality standards (AAQS) for the purposes of determining attainment status. The OHMVR Division recognizes, however, that the Control and CDVAA monitors required by Rule 1001 may be considered local air quality monitoring stations subject to comparison to AAQS, and will work with the District to better understand and define the monitoring objectives, monitor type, representative special scale, and specific air quality monitoring probes, inlets, and optical path criteria that apply to the TMBP and PMRP Control and CDVAA monitors.

The OHMVR Division intends to follow all applicable siting criteria to the maximum extent possible. State and federal criteria recognize that there may be situations when siting criteria cannot be followed. In these instances, the OHMVR Division would thoroughly document when criteria cannot be met and request a waiver from the APCD describing how and why the siting criteria differ.

5.1 U.S. EPA and California Air Resources Board Siting Criteria

Title 40 of the Code of Federal Regulations, Appendix E to Part 58, contains the specific probe and monitoring path siting criteria that apply to ambient air quality monitors (Ambient Air Quality Surveillance 2011). The California Air Resources Board's (ARB) Air Monitoring Quality Assurance Manual, Volume II, also contains siting criteria for air quality monitors (ARB 2000). The specific criteria vary according to the type and spatial scale specified for the particular monitor, but generally include criteria related to:

- Horizontal and vertical placement of the probe and monitoring path
- Unrestricted airflows (requires unrestricted airflow arc of 270 degrees)
- Spacing from local sources of pollutants
- Spacing from obstructions such as buildings
- Spacing from trees, which can provide surfaces for particle deposition
- Spacing from roadways

5.2 Equipment and Other Practical Limitations

In addition to regulatory siting criteria, there are equipment and other practical limitations that need to be considered when siting Control and CDVAA monitors, including:

- Power: FEM monitors consume significant power – 350 watts for the Met One BAM – which may require extensive amounts of batteries or solar panels if electrical service is not available at monitoring sites.

- Shelter: FEM monitors require climate controlled shelters that increase the footprint of the monitor's potential environmental impacts.
- Installation: Special bases/foundations may be needed for monitors installed on sand dunes.
- Security: Any equipment is subject to vandalism and may require extra security features (e.g., fencing).
- Access and Communications: CDVAA and CS monitors will require routine access for maintenance purposes and the ability to remotely communicate monitoring data.

6. Environmental and Land Use Approvals to Consider After Selecting Monitoring Sites

Prior to proposing a temporary or permanent monitoring site, the OHMVR Division will need to analyze environmental and permitting constraints associated with each proposed site.

6.1 California Environmental Quality Act (CEQA)

Any proposed temporary or permanent monitoring site will be reviewed under CEQA for impacts to the environment. The CEQA review will assess the potential for impacts from the installation, operation, and maintenance of the monitoring sites, including routes of travel and impacts from extending utilities to the sites. The potential for significant effects will depend on the locations identified during the initial site selection process; however, aesthetic resources, biological resources, cultural resources, geology and soils, and recreational resources are the environmental factors most likely to be affected. In the likely event that a Negative Declaration or Mitigated Negative Declaration is required, CEQA analysis would take between three and six months, including time to prepare the analysis; conduct necessary field investigations; circulate the document for public review; address public and agency comments; and make the necessary CEQA determinations.

6.2 California Coastal Act

The California Coastal Act of 1976 established the California Coastal Commission to, among other things, "Protect, maintain, and where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources" (California Coastal Act Section 30001.5). The Coastal Act governs any development along the coast, including the placement of any structure in areas within the designated Coastal Zone (including most of Oceano Dunes SVRA and the Guadalupe Nipomo Dune Complex). Since 1982, the SVRA has operated pursuant to a coastal development permit issued by the California Coastal Commission. Since 1987, SLO County has administered the Coastal Act in areas within County jurisdiction through a certified Local Coastal Program (LCP). The County's LCP designates environmentally sensitive habitat areas (ESHA), areas in which plant or animal life (or their habitats) are considered rare or especially valuable due to their special role in an ecosystem. The Coastal Act permits only resource-dependent uses within ESHA.

Most of Oceano Dunes SVRA is within the County's jurisdiction, although a small area around Grand Avenue falls under the City of Grover Beach's LCP, and some lands remain under the Coastal Commission's retained jurisdiction.

The installation of a monitoring device or the extension of a utility connection to support a monitoring device is likely to be considered development under the Coastal Act requiring a permit from the California Coastal Commission or SLO County, depending on the proposed location. Any permit issued by SLO County could be appealed to the California Coastal Commission.

Coastal Act issues associated with temporary and permanent monitoring stations will depend on the conditions at the sites that are ultimately selected. However, it is likely that issues will arise concerning aesthetic resources, biological resources, ESHA, listed species, and recreational opportunities.

Coastal permits from San Luis Obispo County take approximately 3-4 months from the completion of the CEQA analysis. If a project is appealed to the County Board of Supervisors and the Coastal Commission, additional delays of 6 months to more than one year are possible.

6.3 Federal and State Endangered Species Acts

Oceano Dunes SVRA provides habitat for a number of state and federally listed threatened and endangered plants and animals. Two focal species are the federally listed threatened western snowy plover and the state and federally listed endangered California least tern. From March 1 through September 30 of each year, approximately 300 acres of Oceano Dunes SVRA are closed to public access to provide protected nesting habitat for these two listed species.

Any proposed temporary or permanent monitoring station and associated development such as a utility connection would need to be analyzed for impacts to known habitat areas that support listed species. Most of the analysis for impacts to listed species would be through the CEQA analysis discussed above. However, if a monitoring site were proposed for an area that supports a listed species, the OHMVR Division would need to consult with the appropriate regulatory agency (California Department of Fish and Game or the U.S. Fish and Wildlife Service). An informal consultation could be accomplished in 60 days while a formal consultation could take more than one year, depending on the complexity of the issues involved.

6.4 CDPR Policies and Procedures

CDPR has a number of policies and procedures that would need to be considered in the placement of temporary and permanent monitoring sites. The California Public Resources Code spells out a number of allowable activities within the State Park System. The OHMVR Division has also developed a number of policies and operational procedures that provide guidance to local managers on uses within the parks. Each park unit has a General Plan that guides the use and management strategy for the park. Finally, there are a number of long-term strategic initiatives that the OHMVR Division has developed to help focus efforts on issues considered critical to the future of the park system.

Any proposed temporary or permanent monitoring devices will be assessed for consistency with the Public Resources Code, OHMVR Division policy, the unit General Plan, and applicable strategic initiatives.

For example, monitoring sites may be proposed in three different state park system units or sub-units: Oceano Dunes SVRA, Pismo State Beach, and the Pismo State Beach Dunes Preserve. The Public Resources Code outlines allowable uses within each park unit classification. Allowable uses in a Natural Preserve are more restrictive than uses within a State Beach or State Vehicular Recreation Area. Establishing a permanent monitoring site that requires the extension of utility connections into the Dunes Preserve may result in policy concerns that would not exist for a similar project in a State Beach.

An additional planning issue that could arise, depending on the selected monitoring sites, is deeded land use restrictions. Some of the land within Oceano Dunes SVRA is leased from San Luis Obispo County or from Conoco Phillips. Prior to the placement of temporary or permanent monitors on leased land, the OHMVR Division would need to review lease language and other

deed restrictions. Written concurrence from lessors may be required to pursue monitoring sites on leased land.

Analysis of policy consistency can occur during the CEQA review process. Resolving some policy issues could require 60 – 90 days in the event that written permission from lessors is required or other challenging policy issues arise.

In summary, a number of environmental, permitting, policy, and land use issues must be considered prior to the selection of temporary and permanent monitoring sites. For this reason, it is imperative to consider multiple sites when developing Control and CDVAA sites in the event that sites may be eliminated for environmental or related concerns.

7. Site Selection Criteria

The overall intent of this Draft MSSP is to determine where best to position comparative Control and CDVAA monitors in areas immediately downwind of the non-riding and riding areas at Oceano Dunes SVRA. The OHMVR Division recognizes the need to define what upwind conditions may and may not be determined "comparable" for the purposes of the TBMP and PMRP Monitoring Program required by Rule 1001, however, Rule 1001 does not provide any guidance regarding this issue. The OHMVR Division would work with APCD to identify what potential distributions in measured wind speeds, direction, PM10 concentrations, etc. may be considered comparable for the purposes of selecting general downwind monitoring areas and specific Control and CDVAA monitoring sites.

7.1 Comparability of Riding vs. Non-Riding Areas

The first step in evaluating potential locations for comparative PM10 monitoring is to ensure that the non-riding dune areas north and south of the riding area can indeed be considered appropriate to compare to the larger sand sheet of the riding area. This Draft MSSP is designed to answer that question, and—if they are appropriately comparable—to discern which non-riding area is more similar to the riding area.

This task is more complex than it may seem because the geomorphology of the two non-riding areas north and south of the SVRA is different than that of the riding area. The most apparent difference is the amount of open sand, or sand fetch, in each area. Compared to the riding area, the sand fetches in the Dunes Preserve and in the Oso Flaco area are more narrow and do not extend as far landward (See Figures 1 and 2). In the Dunes Preserve, this is due to an introduction of non-native vegetation that proliferated in the foredune area, causing the foredunes to artificially build to a greater height. In the Oso Flaco area, more native vegetation is present currently than existed historically because the OHMVR Division has been planting native vegetation in the area to enhance the habitat around and near Oso Flaco Lake.

Additionally, the potential to generate PM10 from saltation is inherent in any sand dune surface, regardless of whether the dune surface has been disturbed. That means there is an innate potential for the dune surface in the riding area to generate PM10 from saltation. It is unknown to what extent, if any, the potential to generate PM10 from saltation is increased in areas where the dune surface has been disturbed or not.

As detailed in Section 4 and Figure 2 above, the OHMVR Division is proposing to investigate the meteorological conditions, emissivity, actual PM10 profiles (in the horizontal dimension), and dispersion characteristics of upwind non-riding and riding areas to evaluate if non-riding and riding areas are comparable.

7.1.1 Meteorological Conditions

Ideally, the seasonal prevailing wind will pass over the various regions of the Dunes Preserve, the riding area, and the Oso Flaco area at the same speed. In that way, at least wind speed and direction, which is integral to the generation of saltation-derived PM10, could be considered constant throughout the non-riding and riding areas. This, however, has not been confirmed to date. The OHMVR Division, therefore, would evaluate the time and duration of high wind events as well as the distribution of hourly average meteorological conditions (temp., RH,

WS/WD) measured in non-riding and riding areas to determine which areas are subjected to comparable meteorological conditions.

7.1.2 Dune Emissivity

The potential for different dune emissivity characteristics was studied by the District and is implicit in Rule 1001. The OHMVR Division would evaluate the distribution in the saltation and PM10 emission flux measured using DRI's PI-SWERL device to determine what the inherent relationship between wind shear, saltation and PM10 generation is in non-riding and riding areas (See Figure 2), and how it compares among these areas.

7.1.3 Open Sand Fetch

The proposed E-BAM and APP monitoring sites are intended to provide a real-time evaluation and field check of the actual emissivity of different dune regions under a range of conditions and to discern if PM10 emission from saltation can be related to sand fetch in a linear, logarithmic, or more complex way. The OHMVR Division would evaluate the distribution in and relationship between aerosol particle counts and E-BAM PM10 concentrations, to determine if PM10 profiles are comparable between non-riding and riding areas and consistent between fore, mid-, and back-dune regions.

7.2 Siting and Environmental Permitting Factors

Specific downwind Control and CDVAA monitor sites should meet regulatory siting criteria to the maximum extent practical and be capable of being permitted by May 31, 2013, as required by Rule 1001. The OHMVR Division would evaluate the differences in constraints associated with power, security, access, and environmental review requirements when selecting Control and CDVAA monitoring site locations.

7.3 Control and CDVAA Monitor Site Selection

Section 4 of this Draft MSSP describes the OHMVR Division's proposed temporary meteorological and PM10 monitoring array, scheduled to be deployed during the Spring 2012 windy season. This temporary array consists of many non-FEM monitoring sites located throughout the Oceano Dunes SVRA and will not be used to assess compliance with Rule 1001 performance standards. Thus, this monitoring effort is different from the short-term TBMP and long-term PMRP Monitoring Program described in Sections B.14 and B.13, respectively, of Rule 1001. The OHMVR Division's proposed temporary meteorological and PM10 monitoring program is intended to inform selection of the TBMP and PMRP Monitoring Program Control and CDVAA monitor sites, which will be used to assess compliance with Rule 1001 performance standards, by evaluating the upwind conditions and dispersion characteristics that will ultimately influence the ability to meet Rule 1001 performance standards. Rule 1001 requires the TBMP Control and CDVAA monitors to meet FEM specifications, unless otherwise allowed by the APCO. The OHMVR Division would work with the APCO during the site selection process to determine if non-FEM monitors are appropriate for the TBMP required by Rule 1001 given the results of the investigations described in Section 4 and the siting and other environmental and land use approvals necessary to install FEM monitors described in Section 5 and Section 6, respectively.

8. References and Acronyms

Ambient Air Quality Surveillance 2011. 40 CFR Part 58, Appendix E. 2011

California Air Resources Board (ARB) 2000. *Air Quality Monitoring Assurance, Volume II*. California. 2000.

Desert Research Institute (DRI) 2011. Oceano Dunes Pilot Projects Final Project Report. Reno, Nevada. September 15, 2011.

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

San Luis Obispo (SLO) County Air Pollution Control District (APCD) 2012. *2012 Community Particulate Monitoring Project Monitoring Plan*. San Luis Obispo, CA. November 2011.

List of Acronyms Used in the Draft MSSP

AAQS	Ambient Air Quality Standard
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
APCD	Air Pollution Control District
APCO	Air Pollution Control Officer
APP	Met One Instruments Model 212-1 Ambient Particulate Profiler
ARB	California Air Resources Board
CDPR	California Department of Parks and Recreation
CDVAA	Coastal Dune Vehicle Activity Area
CEQA	California Environmental Quality Act
DRI	Desert Research Institute
E-BAM	Met One Instruments Environmentally-protected Beta Attenuation Mass Monitor
ESHA	Environmentally Sensitive Habitat Area
FEM	Federal Equivalent Method
LCP	Local Coastal Program
M	Meter
MSSP	Monitoring Site Selection Plan
OHMVR	Off-Highway Motor Vehicle Recreation
OHV	Off-Highway Vehicle
PI-SWERL	Portable In-Situ Wind Erosion Laboratory
PMRP	Particulate Matter Reduction Plan
RH	Relative Humidity
S	Second
SLO	San Luis Obispo
SVRA	State Vehicular Recreation Area
TBMP	Temporary Baseline Monitoring Program
Temp	Temperature
WS	Wind Speed
WD	Wind Direction
Mg	Micrograms

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APPENDIX A
RULE 1001 – COASTAL DUNES DUST CONTROL REQUIREMENTS

REGULATION X

FUGITIVE DUST EMISSION STANDARDS, LIMITATIONS AND PROHIBITIONS

RULE 1001 Coastal Dunes Dust Control Requirements *(Adopted 11/16/2011)*

A. APPLICABILITY. The provisions of this Rule shall apply to any operator of a coastal dune vehicle activity area, as defined by this Regulation, which is greater than 100 acres in size.

B. DEFINITIONS. For the purpose of this Rule, the following definitions shall apply:

1. "APCD": The San Luis Obispo County Air Pollution Control District.

2. "APCO": The San Luis Obispo County Air Pollution Control Officer.

3. "Coastal Dune": means sand and/or gravel deposits within a marine beach system, including, but not limited to, beach berms, fore dunes, dune ridges, back dunes and other sand and/or gravel areas deposited by wave or wind action. Coastal sand dune systems may extend into coastal wetlands.

4. "Coastal Dune Vehicle Activity Area (CDVAA)": Any area within 1.5 miles of the mean high tide line where public access to coastal dunes is allowed for vehicle activity.

5. "CDVAA Monitor": An APCO-approved monitoring site or sites designed to measure the maximum 24-hour average PM_{10} concentrations directly downwind from the vehicle riding areas at the CDVAA. At a minimum, the monitoring site shall be equipped with an APCO-approved Federal Equivalent Method (FEM) PM_{10} monitor capable of measuring hourly PM_{10} concentrations continuously on a daily basis, and an APCO-approved wind speed and wind direction monitoring system.

6. "CDVAA Operator": Any individual, public or private corporation, partnership, association, firm, trust, estate, municipality, or any other legal entity whatsoever which is recognized by law as the subject of rights and duties, who is responsible for the daily management of a CDVAA.

7. "Control Site Monitor": An APCO-approved monitoring site or sites designed to measure the maximum 24-hour average PM_{10} concentrations directly downwind from a coastal dune area comparable to the CDVAA but where vehicle activity has been prohibited. At a minimum, the monitoring site shall be equipped with an APCO-approved Federal Equivalent Method (FEM) PM_{10} monitor capable of measuring hourly PM_{10} concentrations continuously on a daily basis, and an APCO-approved wind speed and wind direction monitoring system.

8. "Designated Representative": The agent for a person, corporation or agency. The designated representative shall be responsible for and have the full authority to implement control measures on behalf of the person, corporation or agency.

9. "Monitoring Site Selection Plan": A document providing a detailed description of the scientific approach, technical methods, criteria and timeline proposed to identify, evaluate and select appropriate locations for siting the temporary and long-term CDVAA and control site monitors.

10. "Paved Roads": An improved street, highway, alley or public way that is covered by concrete, asphaltic concrete, or asphalt.

11. "PM_{10}": Particulate matter with an aerodynamic diameter smaller than or equal to a nominal 10 microns as measured by the applicable State and Federal reference test methods.

12. "PMRP": Particulate Matter Reduction Plan.

13. "PMRP Monitoring Program": The APCO approved monitoring program contained in the PMRP that includes a detailed description of the monitoring locations; sampling methods and equipment; operational and maintenance policies and procedures; data handling, storage and retrieval methods; quality control and quality assurance procedures; and related information needed to define how the CDVAA and Control Site Monitors will be sited, operated and maintained to determine compliance with section C.3.

14. "Temporary Baseline Monitoring Program": A temporary monitoring program designed to determine baseline PM10 concentrations at the APCO-approved CDVAA and Control Site Monitor locations prior to implementation of the PMRP emission reduction strategies and monitoring program. The program shall include a detailed description of the monitoring locations; sampling methods and equipment; operational and maintenance policies and procedures; data handling, storage and retrieval methods; quality control and quality assurance procedures; and related information needed to define how the temporary monitors will be sited, operated and maintained to provide the required baseline data. The temporary monitors shall meet the specifications of the CDVAA and Control Site Monitors unless otherwise specified by the APCO.

15. "Track-Out": Sand or soil that adhere to and/or agglomerate on the exterior surfaces of motor vehicles and/or equipment (including tires) that may then fall onto any highway or street as described in California Vehicle Code Section 23113 and California Water Code 13304.

16. "Track-Out Prevention Device": A gravel pad, grizzly, rumble strip, wheel wash system, or a paved area, located at the point of intersection of an unpaved area and a paved road that is designed to prevent or control track-out.

17. "Vehicle": Any self-propelled conveyance, including, but not limited to, off-road or all-terrain equipment, trucks, cars, motorcycles, motorbikes, or motor buggies.

18. "24-Hour Average PM_{10} Concentration": The value obtained by adding the hourly PM_{10} concentrations measured during a calendar 24-hour period from midnight to midnight, and dividing by 24.

C. GENERAL REQUIREMENTS

1. The CDVAA operator shall develop and implement an APCO-approved Temporary Baseline Monitoring Program to determine existing PM10 concentrations at the APCO-approved CDVAA and Control Site Monitor locations prior to implementation of the PMRP emission reduction strategies and monitoring program.

2. The operator of a CDVAA shall prepare and implement an APCO-approved Particulate Matter Reduction Plan (PMRP) to minimize PM_{10} emissions for the area under the control of a CDVAA operator. The PMRP shall contain measures that meet the performance requirements in C.3 and include:

   a. An APCO-approved PM_{10} monitoring network containing at least one CDVAA Monitor and at least one Control Site Monitor.
   b. A description of all PM_{10} control measures that will be implemented to reduce PM_{10} emissions to comply with this rule, including the expected emission reduction effectiveness and implementation timeline for each measure.
   c. A Track-Out Prevention Program that does not allow track-out of sand to extend 25 feet or more in length onto paved public roads and that requires track-out to be removed from pavement according to an APCO-approved method and schedule.

3. The CDVAA operator shall ensure that if the 24-hr average PM_{10} concentration at the CDVAA Monitor is more than 20% above the 24-hr average PM_{10} concentration at the Control Site Monitor, the 24-hr average PM_{10} concentration at the CDVAA Monitor shall not exceed 55 ug/m3.

4. The CDVAA operator shall ensure they obtain all required permits from the appropriate land-use agencies and other affected governmental agencies, and that the requirements of the California Environmental Quality Act (CEQA) and the National Environmental Quality Act (NEPA) are satisfied to the extent any proposed measures identified in the PMRP or Temporary Baseline Monitoring Program require environmental review.

5. All facilities subject to this rule shall obtain a Permit to Operate from the Air Pollution Control District by the time specified in the Compliance Schedule.

D. Exemptions

1. Section C.3 shall not apply during days that have been declared an exceptional event by the APCO and where the United States Environmental Protection Agency has not denied the exceptional event.

E. RECORDKEEPING REQUIREMENTS: The CDVAA operator subject to the requirements of this Rule shall compile and retain records as required in the APCO approved PMRP. Records shall be maintained and be readily accessible for two years after the date of each entry and shall be provided to the APCD upon request.

F. COMPLIANCE SCHEDULE:

1. The CDVAA operator shall comply with the following compliance schedule:

    a. By February 28, 2012, submit a draft Monitoring Site Selection Plan for APCO approval.
    b. By May 31, 2012, submit a draft PMRP for APCO review.
    c. By November 30, 2012, submit complete applications to the appropriate agencies for all PMRP projects that require regulatory approval.
    d. By February 28, 2013, obtain APCO approval for a Temporary CDVAA and Control Site Baseline Monitoring Program and begin baseline monitoring.
    e. By May 31, 2013, complete all environmental review requirements and obtain land use agency approval of all proposed PMRP projects.
    f. By July 31, 2013, obtain APCO approval of the PMRP, begin implementation of the PMRP Monitoring Program, and apply for a Permit to Operate.
    g. By May 31, 2015, the requirements of Section C.3 shall apply.

2. With the exception of section F.1.g, the CDVAA operator will not be subject to civil penalties for failure to meet any timeframe set forth in section F.1 caused solely by delays from regulatory or other oversight agencies required to consider and approve the operator's PMRP or any part thereof.

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APPENDIX B
PROPOSED MET ONE INSTRUMENTS TECHNICAL SPECIFICATIONS:
E-BAM and Model 212 Ambient Particulate Profiler

E-BAM is a complete measurement system it comes with the following standard components:

- 8 Channel Datalogger
- Internal DC Vacuum Pump Standard
- Real-Time Concentration
- PM10 Inlet
- Aluminum Tripod
- Ambient Temperature Sensor
- Volumetric Flow Control
- Weatherproof Enclosure
- Filter Temperature Sensor
- Filter RH Sensor
- Filter Pressure Sensor
- Calibration Membrane

Specifications

Range	0 - 65 mg per cubic meter
Accuracy	2.5 µg or 10% in 24 hour period
Measurement Cycle	Hourly measurements with 1, 5, 10, 15, or 30 min real-time averages
Beta Source	C14, less than 75 microcurie, Half life of 5730 years
Detector:	Scintillation probe
Analog Output	0-1V, 0-2.5v, 0-5V, selectable hourly or real-time output
Filter Tape	Continuous glass fiber filter
Inlet	Compatible with EPA PM10 and PM2.5 inlets
Flow Rate:	16.7 liters per minute, adjustable
Flow accuracy	+/- 2% of reading, volumetric flow controlled
Sample Pump	Dual diaphragm type, DC powered, 4000 hr rating
Alarm Signals	Filter, flow, power and operation failure
Input Power	12 Volts DC @ 48 Watts max
Alarm Contact Closure	2 Amp @ 240 VAC max
Operating Temperature	-30 Deg C to 50 Deg C
Enclosure	41 cm x 36 cm x 20 cm, 13kg

Options and Accessories

- BX-302 Zero Calibration Kit
- BX-305 Leak check valve
- BX-307 Flow Calibrator
- BX-308 PM2.5 Sharp-Cut Cyclone
- BX-803 TSP Inlet
- EX-034 Wind speed and direction sensor
- EX-121 AC Power supply, 100-240 VAC, 12 VDC output
- EX-593 Ambient RH Sensor
- EX-996 Phone modem kit
- EX-911 Cell modem kit
- 460130 Filter tape, roll
- 9425 Wall mount bracket
- Airsis Satellite modem kit
- External AC Vacuum Pump
- MMP MicroMet Plus Software
- Solar Panel Array

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Rev. 08/09

E-BAM

The Met One E-BAM is a portable, real-time beta gauge which is comparable to U.S. EPA methods for $PM_{2.5}$ and PM_{10} particulate measurements.

The Met One E-BAM has been built to satisfy users, regulators and those from the health community by providing truly accurate, precise, real time measurement of fine particulate matter automatically. In addition, it is rugged, portable, battery operated, and deployable in 15 minutes.

The E-BAM offers the following advanced features:

1. Accuracy and precision consistent with U.S. EPA requirements for Class III $PM_{2.5}$ and PM_{10} measurement.
2. Real-time, accurate results without correction factors, regardless of season or geographic location.
3. True ambient sampling provides accurate measurement of semi-volatile nitrates and organic compounds.
4. Lightweight, rugged construction is easily mounted on a tripod in minutes.
5. All-weather construction allows for true ambient sampling.
6. Operates on AC or DC power. Battery and Solar options available upon request.

Met One Instruments, Inc.

Met One Instruments, Inc.

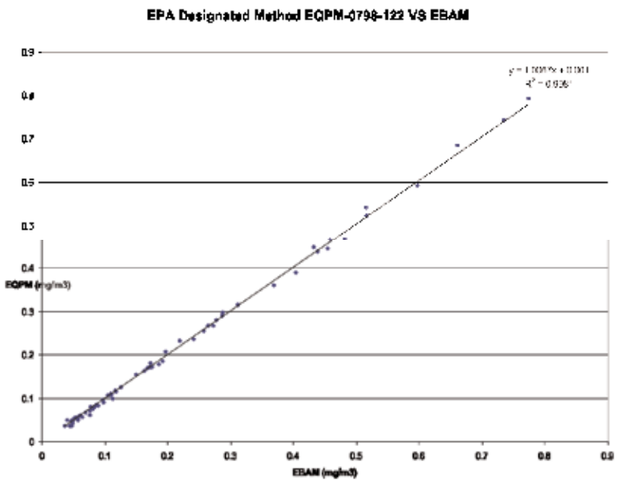
Continuous Monitoring

The E-BAM automates particulate measurement by continously sampling and reporting concentration data. Data records are updated every minute. E-BAM eliminates the old process of filter collection and manual filter weighing, and eliminates the need for more expensive, high maintenance instruments. Today, with the adaptation of Beta Attenuation to ambient monitoring this process became simple, streamlined, and inexpensive.

About Accuracy

Real-time accurate, reliable, and repeatable measurement of ambient fine particulate matter has been the elusive goal of environmental regulators and health professionals for many years. Met One Instruments has developed advanced particulate monitoring instrumentation which is reliable, and is easy to operate. It will also automatically report results in near real time, eliminating the need for high levels of human intervention.

Because sampling occurs under true ambient conditions semi-volatile organic compounds and nitrates are easily detected thereby avoiding under measurement.



Continuous Sampling

E-BAM is a lightweight portable instrument that operates directly in hostile environments without an exterior enclosure. E-BAM is a very robust portable sampler system that is easily installed in less than 15 minutes. No other sampler matches the portability and flexibility of the E-BAM.

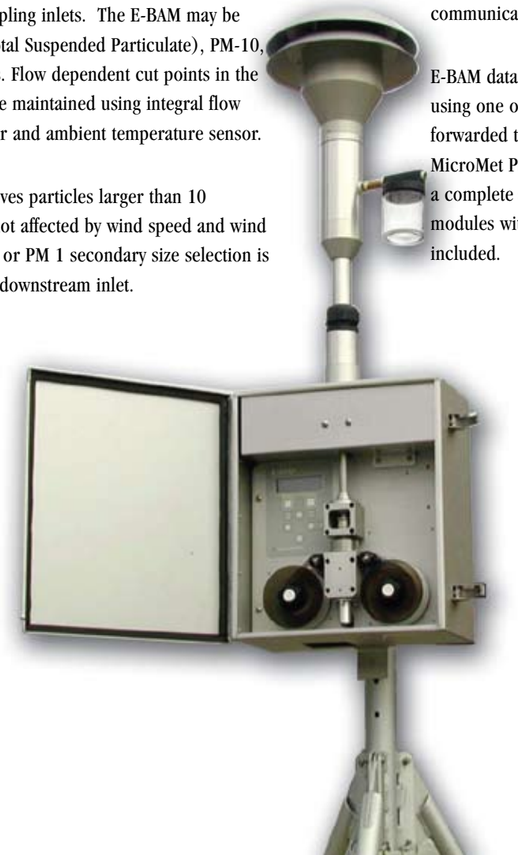
Set up

Quick setup of the E-BAM is assured with a series of prompts instructing the installer on the sequence to follow. Then the E-BAM performs a series of self test diagnostics and alerts the installer of any corrective action. Upon completion, the E-BAM automatically places itself in normal operate mode.

Particulate size selection

Size selective concentration measurements are made using a variety of sampling inlets. The E-BAM may be supplied with TSP (Total Suspended Particulate), PM-10, PM 2.5 or PM 1 inlets. Flow dependent cut points in the size selective inlets are maintained using integral flow meter, pressure sensor and ambient temperature sensor.

The PM-10 inlet removes particles larger than 10 microns, the inlet is not affected by wind speed and wind direction. For PM 2.5 or PM 1 secondary size selection is made using a second downstream inlet.



Construction etc.

The standard configuration of the E-BAM is a self-contained environmentally sealed aluminum enclosure placed on a rugged tripod. This system can be permanently placed on rooftops, near roads, at industrial sites, or rapidly deployed to monitor emergency situations.

'E- 'represents Environment Proof instrument, E-BAM has been specifically designed to work in hostile environments without additional protection.

Direct Field Reporting

Collecting real time or historical particulate data from a field site has never been easier. Advanced communication options include cellular phone, Line of Sight Radio, and for very remote sites, satellite communications are now available. E-BAM also supports the full line of standard MET ONE options, such as phone modem, and direct communications to a portable computer.

E-BAM data is recorded internally and may be retrieved using one of the communication options, or data may be forwarded to third party data acquisition system. MicroMet Plus Software supports the E-BAM and provides a complete communication, data base and reporting modules with charting. Comet data retrieved software is included.

Digital, Analog and Alarm Outputs

The E-BAM provides both continuous digital and analog outputs. Analog output is selectable to several full-scale voltages. Digital output is supplied as RS-232.

Reporting modes

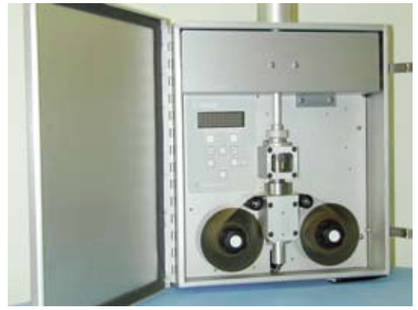
The internal data logger can store up over 182 days of concentration data at one hour sample times, and collect data from eight other measurements at the same time! Both digital and analog outputs are included to enable users to connect to other data recording systems.

Easy to Operate

E-BAM has been programmed to operate at all times, except during calibration verification. Current data, historical data, and status information are available at all times without interrupting normal E-BAM operation.

Data Validation

The operator may select various criteria for data validation, including deviation from rolling average, high value excursions, power failure and others. If an error occurs it is entered into the error log with date, time and type of error.



212 Ambient Particulate Profiler

Met One Instruments, Inc.

Ambient profiling of aerosol particulates has been simplified by the Met One Instruments Model 212 Ambient Particulate Profiler. The 212 sizes and counts particles in eight digital bins, and reports the information on command. Each of the eight channels may be field configured to customer requirements.

A Remarkably Flexible, Higher Performance Instrument Featuring:

- Eight Real-Time Channels
- Self-Contained
- Low Power / Low Cost
- 0.5µm to 10µm (typical) range, extended ranges available
- Simple Operation
- Weatherproof package
- Sheath air technology

How it Works

Using a laser-diode based optical sensor, the 212 uses light scatter technology to detect, size and count particles. This detected information is output as particles per size range.

Two Models

Two models of the 212 Profiler are available, each with specific features.

For general purpose outdoor applications the Model 212-1 is recommended. The 212-1 has a minimum sensitivity of 0.5 microns and will size particles up to 10 microns. Particles larger than 10 microns are counted, but sized as 10 microns. The 212-1 uses an extended life Laser Diode that provides 30,000 hours of life, three times the life of standard lasers. Additionally the 212-1 will operate reliably in elevated temperatures.

For special applications the Model 212-2 has a minimum sensitivity of 0.3 microns. A lower wavelength Laser Diode is used in the 212-2 and will produce 10,000 hours of life.

Applications:

Air Quality Surveys
Work Place Monitoring
Ambient Monitoring
Emissions Sampling
Remote Monitoring

Special size ranges are available. Consult factory for details.

Measurement Principle	Optical, Light-Scatter using a Laser Diode
Flow Rate	1.0 LPM
Measuring Ranges	
212-1	0.5µm to 10µm (eight selectable sizes)
212-2	0.3µm to 10µm (eight selectable sizes)
Concentration	0-9,000,000 Particles per cubic. ft.
Sample Flow Rate	1 LPM
Sample Interval	1 - 60 seconds
Accuracy	+ / - 10% to calibration aerosol
Communication	RS 232 Output
Power	12 VDC 240 mA maximum Inlet Heater, additional 750 mA
Temperature	212-1 0 to +70 Degrees Celsius 212-2 0 to +40 Degrees Celsius
Weight	3 lb. (1.2kg)
Size	Diameter 4.0 in, Length 7.5 in +12” for inlet tube
INCLUDED OPTIONS	
Software	Real Time Datalogging and Graphing, Remote Operation
Software requirements	Pentium, 100 mhz, 16MB Ram

Installation

Installation is quick and easy with the 212 particle counter. It can be mounted on a tripod, wall mounted, bench mounted or on pole. Due to its rugged weatherproof enclosure, the 212 can be installed in most outdoor environments.

Data is calculated every sample period and downloaded through the serial cable. The data can be captured by any serial device (Laptop, Palm top, Serial printer, etc.). The data can then be analyzed using standard programs such as excel.

With the included software package, data is automatically saved and graphed in real-time. This software allows the remote control of the 212, sample time, date/time, unit ID, rolling averages, alarm levels, start and stop, and reset commands can all be made from a laptop with the software.

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