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Ms. Gina McCarthy, Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue N.W.
Washington, D.C. 20760

Subject: Draft Guidance on the Implementation of the Exceptional Events Rule Comments

Dear Ms. McCarthy:

The Great Basin Unified Air Pollution Control District (Great Basin) appreciates the opportunity to provide comments on the U.S. Environmental Protection Agency's (EPA's) May 2, 2011 draft of proposed guidance for the implementation of the 2007 Exceptional Events Rule (EER) [72 Fed. Reg. 55 (22 March 2007)]. Great Basin is the agency tasked with attaining federal and state air quality standards in Eastern California's Alpine, Mono and Inyo Counties. Great Basin is home to the two largest sources of anthropogenic fugitive windblown PM_{10} in the country: the exposed beds of Owens and Mono Lakes. These sources routinely record the highest 24-hour PM_{10} values in the country. Pre-control PM_{10} emissions at Owens Lake were over 80,000 tons per year. For more than 20 years Great Basin has operated an extensive network of PM_{10} and soil motion monitors on and around these lake beds that provide great insight into the mechanics of windblown dust. In addition, we have conducted over a decade of research into developing effective PM_{10} controls and have overseen the implementation of over $1 billion of controls on Owens Lake. These efforts have reduced PM_{10} emissions from Owens Lake by almost 90 percent.

With regard to natural and exceptional events policy development, Great Basin worked with the USEPA, as well as the U.S. House and Senate committees, in 1990 on clarifying language regarding anthropogenic events contained in the Clean Air Act Amendment reports. The District also worked with the USEPA on the Mary Nichols memo "Areas Affected by PM-10 Natural Events." It is with these credentials that we offer the following comments on the proposed exceptional events (EE) guidance.

Definition of "Reasonable"

The terms "reasonable," "reasonably controllable" and "reasonably controlled" are used throughout the documents and are crucial in deciding whether monitored emissions are exceptional or are the result of inadequate (or nonexistent) controls. For serious

nonattainment areas, like the Southern Owens Valley (Owens Lake) and Mono Basin (Mono Lake), Best Available Control Measures (BACM) must be required to be in place and fully operational on all anthropogenic sources that cause or contribute to PM standard exceedances. Reasonably Available Controls (RACM) or other lesser levels of control are not sufficient for serious nonattainment areas. It appears that this may be required by the current draft guidance; however, the requirement is a footnote (#16) on page 13 of the High Winds document. This requirement should be made very clear. Effective BACM developed specifically for the source areas to be controlled should be effective in controlling emissions in all but the very highest winds—this is, after all, the whole point of a Best Available Control Measure.

In addition, agencies must prove that actual controls were in place and operational—not just that controls are required by rule or regulation and are presumed to be in place. Our guiding principle of protecting public health requires us to do our very best to control anthropogenic sources on high wind days, especially if the winds cause PM emissions from undisturbed areas. These are just the conditions that cause the greatest threat to public health and are the conditions under which we should be making our best efforts at public protection.

25 Miles per Hour Default Threshold Wind Speed

By far, Great Basin's greatest issue of concern is the proposed use of 25 miles per hour (mph) as the assumed minimum threshold wind speed necessary to entrain particles from stable (natural and controlled anthropogenic) surfaces. Any default wind speed, especially a low one like 25 mph, provides an excuse for not controlling serious PM sources and may encourage facilities to refrain from implementing dust controls where and when they are needed most. It is very important that 25 mph not be set as the hard, bright line as to what constitutes high wind events for all arid areas. Depending on the many variable local circumstances and conditions, the actual wind speed required to produce emissions from undisturbed and reasonably controlled surfaces will vary greatly from the 25 mph set forth in the draft guidance. In addition, the District contends such a default threshold is not allowed by the EER.

The proposed guidance refers to "empirical evidence" and "numerous studies" (High Winds document, pages 3 and 14) as justification for using 25 mph. It is unfortunate that EPA used only three limited studies to derive a proposed threshold number. None of the studies were designed to be used to set national air pollution guidance. In fact, based on Great Basin's decades of studying this issue, we contend that there are virtually no undisturbed natural surfaces in the arid west with PM_{10} emission thresholds as low as 25 mph. PM_{10} emissions that occur at 25 mph almost certainly come from disturbed uncontrolled or poorly controlled surfaces. Please refer to the attached information discussing the proposed 25 mph threshold wind speed in more technical detail.

Another concern regarding the concept of a default threshold wind speed is that it does not appear to be allowed by the EER. On page 14 of the proposed High Winds guidance document it states, "In the absence of local studies, EPA intends to use 25 mph as the minimum sustained wind speed." In contrast, Section VII.B.2. of the rule states:

> "In this rule, EPA is not identifying a specific wind speed which should be considered when making a determination concerning whether an event should qualify as exceptional. Instead, EPA is requiring that States submit appropriate documentation which demonstrates why a particular event should be considered exceptional for the affected area. The EPA will review the documentation submitted by States concerning high wind events and will make decisions concerning whether to exclude the data as being influenced by an exceptional event on a case-by-case basis."

This makes is clear that EPA cannot set a threshold wind speed, but must require the states to submit appropriate documentation to exclude data that may be influenced by exceptionally high winds that would overwhelm BACM and reasonable dust control measures. As required by the rule, it is important that a case-by-case analysis by done for each area since BACM regulations and compliance needs are different in all states and areas. EPA should follow the rule and require every area to submit an exceptional events analysis based on real, area-specific evidence. A presumed default threshold wind speed applicable to all areas under all circumstances is in conflict with the EER and is not the appropriately conservative approach that protection of public health requires.

Finally, a concerning consequence of setting a low default wind speed threshold will be the pressure on local agencies from air polluters to flag the PM_{10} data that occur any day the winds exceed 25 mph. It is certainly simpler (and less expensive) to claim an exceptional event than it is to deploy effective controls.

Frequency of Exceptional Events

The Overview document states (page 6 of 8): "A natural event would not have to be infrequent to qualify as an exceptional event under the EER." How can a frequent event be exceptional? If the event is frequent, then reasonable controls should be developed for that event. For example, winds over 25 mph are frequent in the Owens Valley. During the 26-year period between March 1985 through May 2011, there were 3,408 days with hourly average (as opposed to 1-minute average) wind speeds greater than 25 mph. **This is an average of 130 days per year**. Even if the threshold was raised to a 45 mph (hourly) average, the Owens Valley experienced almost 5 days per year (4.8) that exceeded this increased threshold during the 26-year period. High wind days are not infrequent or exceptional in the Owens Valley and the arid west—we expect the deployment of measures that control anthropogenic emissions on these days. Protecting public health requires as much.

Sustained Wind

In addition to contending that 25 mph is too low for a default threshold wind speed (and is, in fact, prohibited by the EER), the use of one-minute averages to determine an exceptional event is inappropriate and, for most monitoring agencies, impractical. The PM_{10} standard is a 24-hour standard. How can one minute of 25 mph wind in a 24-hour period be considered exceptional? If control measures are in place, it is extraordinarily unlikely that a one to five minutes high wind could have a meaningful impact on the 24-hour PM_{10} standard. Many arid areas of the west experience episodic wind events. At Owens and Mono Lakes, it is not uncommon to experience high winds, with attendant elevated PM_{10} levels, for short periods

(1 to 2 hours) within the monitoring day, while the remaining hours of the day have much lower winds and PM_{10} levels. The few high wind/high PM_{10} hours are cancelled out by the numerous low wind/low PM_{10} hours and there is no exceedance. These frequent occurrences should not be grounds for excluding air quality data. We would argue that the truly exceptional events are the rare events with sustained high winds occurring over many hours or extreme winds (much higher than 25 mph) with extreme PM_{10} levels that occur for brief periods of time. An exceptional event is certainly not any day with one minute of 25 mph winds.

It is our understanding that, although many agencies collect one-minute (or more frequent) wind speeds, the archived frequency is typically one hour. Great Basin normally samples at two-second intervals (to determine highest hourly gusts), but logs only hourly averages and the highest 2-second gust for every hour. The EPA's "Quality Assurance handbook for Air Pollution Measurement Systems (Volume 4: Meteorological Measurements Version 2.0)" [EPA-454/B-08-002, March 2008] requires non-NCore stations to collect at least 1 minute raw data, but the minimum sample frequency is hourly (Table 0-5). It would be appropriate to match exceptional event data requirements with the EPA's own meteorological monitoring requirements. Exceptional winds should be at least one-hour average winds.

Use of USDA Best Management Practices

The guidance suggests that U.S. Department of Agriculture best management practices (BMPs) could be a source of reasonable controls for exceptional events (High Wind document, pages 3 and 12). USDA BMPs are developed to prevent soil loss—they are not intended to protect public health. BMPs are not BACM and it is certainly not appropriate to use such measures as a surrogate for public health protection.

Requirement for a Conceptual Model

The guidance requires exceptional events packages to contain a "conceptual model" (High Wind document, Section 6.2.1, page 32). All exceptional events packages should provide a narrative description of the event. However, characterizing the "story" as a model is not appropriate. Great Basin believes the packages should contain real models of the event using wind speeds, wind directions, monitor locations and monitor values. "Stories" should not be substituted for science and science should be used to the extent possible to verify exceptional event claims.

Providing for Public Comment

Section 5.3 (page 29) of the High Wind document provides for the possibility of public comment. How will EPA determine if public comment is required? Great Basin believes that all efforts to excuse monitored exceedances of National Ambient Air Quality Standards should include an opportunity for the public to comment. Excluding real health-threatening air pollution from the record, regardless of reason, is not an action that should be handled solely by bureaucrats behind closed doors.

Great Basin appreciates to opportunity to provide comment on the draft guidance. We encourage EPA staff to contact us regarding the extensive work we have conducted for more than 20 years that directly relates to EPA's current exceptional event efforts. Great Basin staff

is among the most knowledgeable in the country regarding the cause and control of fugitive dust emissions. We believe our work and experience can help EPA develop guidance that provides flexibility without jeopardizing our shared mission of protecting public health.

Sincerely,

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Enclosure

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GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

ADDITIONAL INFORMATION REGARDING THE PROPOSED EXCEPTIONAL EVENTS DEFAULT THRESHOLD WIND SPEED OF 25 MILES PER HOUR

The Great Basin Air Pollution Control District's (District's) contends the use of a 1 to 5 minute maximum wind as a default wind speed that could overwhelm reasonable controls is incorrect and will be detrimental to the protection of public health. Based on three windblown dust examples, the proposed Exceptional Events guidance concludes that a 25 mile per hour (mph) maximum wind speed using a 1 to 5 minute averaging period could overwhelm best available control measures (BACM). Although this wind speed can cause some windblown dust to be emitted from a controlled surface, the amount of PM emissions generated over a 1 to 5 minute period with a 25 mph wind is not high enough to pose an air quality threat, especially from an area properly controlled with BACM.

Figure 1 shows the relationship between wind speed and downwind 24-hour average PM_{10} concentrations at Mono Lake, California. In this case, windblown dust was emitted from an uncontrolled open area and the PM_{10} emissions were in the same range as those measured in the UNLV study (Wacaser, et al., 2006). However, the hourly average winds were over 25 mph, and 5-minute winds were over 30 mph before an exceedance of the standard (150 $\mu g/m^3$) was measured. It should be noted that this example is for an uncontrolled area. If approved-BACM was applied at Mono Lake, it is unlikely that there would have been exceedances at any wind speed. Figures 2 and 3 show measured hourly PM_{10} emissions as a function of hourly wind speed at Owens Lake, California for BACM shallow flood and BACM managed vegetation areas. The District's BACM for these areas provides at least the 99 percent PM_{10} emission reductions required to meet the PM_{10} NAAQS.

A default wind speed should not be used as the criteria for when BACM is overwhelmed, unless there is actual emissions data from a BACM controlled area to show that this is the case. The District refers to reasonable controls as BACM in this memo, because all three areas used for the Exceptional Event windblown dust examples are serious PM_{10} nonattainment areas and therefore require BACM for fugitive dust control. The UNLV wind tunnel study does not indicate if the stable surfaces were actually controlled with BACM when the measurements were taken. The study showed that at low wind speeds there is very little difference in the emissions from stable and unstable surfaces—this indicates that the stable surface was actually unstable. The difference at the higher wind speeds was likely caused by more erodible material being available on the freshly-raked disturbed surfaces. It would have been a better case for a BACM-controlled surface if the stable surface had been wetted or controlled with a chemical stabilizer before testing (that is, an approved BACM should have been applied). If these "stable" surfaces passed the Clark County BACM test, there should be an investigation to see if BACM should be strengthened, because it does not appear to be working on the test sites.

The UNLV wind tunnel used in the tests was based on a wind tunnel designed by Duane Ono of the District's staff and Dr. Chatten Cowherd at the Midwest Research Institute. (Ono and Cowherd, 1990) A comparison of wind tunnel based emissions and measured emissions from a

recent study at Mono Lake is shown in Figure 4. (Ono, et al., 2011) The Mono Lake results show the wind tunnel overestimated actual emissions at lower wind speeds, and underestimated emissions at the highest wind speeds. Note that the District recommends using the wind tunnel emissions with hourly average wind speeds and not maximum 1 to 5 minute winds, and that the UNLV study expressed the results as hourly average emissions, presumably following the District's recommendation for use of the wind tunnel.

The District observes that the Phoenix wind tunnel-based emission estimates used 5-minute wind data, but they applied the emission algorithm with each 5 minute period and not the maximum 5-minute wind. They also did not verify by field inspection that BACM was actually in place during the event they investigated in Phoenix. The South Coast investigated the application of BACM and used 1-minute winds, but they had much higher winds associated with wind events than the 25 mph default criteria proposed in this guidance. It appears that the three examples used wind speeds and averaging times appropriately, but that this was misinterpreted in the proposed guidance.

The District recommends that all agencies interested in characterizing wind speeds that could overwhelm BACM take wind erosion measurements during an actual wind event in areas that are controlled with BACM. The District is working with the Center for the Study of Open Source Emissions and will shortly submit an emissions measurement test method for windblown dust as an USEPA Other Test Method (OTM). A simple low-cost version of this test method could be applied to determine the effectiveness of BACM control measures and the wind speed that could cause BACM to be overwhelmed.

In conclusion, the assignment of a default threshold wind speed to all areas under all conditions is not supported by the evidence used by the USEPA or evidence developed by the District during its more than 20 years of studying this issue.

References

Wacaser, R., James, D., Jeong, J., Pulurgurtha, S. *Refined PM10 Aeolian Emission Factors for Native Desert and Disturbed Vacant Land – 2004 (Final Report),* University of Nevada Las Vegas, Dept. of Civil Engineering, Las Vegas, NV, June 30, 2006.

Ono, D., Richmond, K., Kiddoo, P., Howard, C., Davis, G. Application of a combined measurement and modeling method to quantify windblown dust emissions from the exposed playa at Mono Lake, California, *J. Air & Waste Management Assoc.*, **2011** (in press).

Ono, D., Cowherd, C. Design and Testing of a Reduced-scale Wind Tunnel for Surface Erodibility Determinations, Annual Air & Waste Management Conference, Pittsburgh, PA, paper no. 90-84.6, 1990.

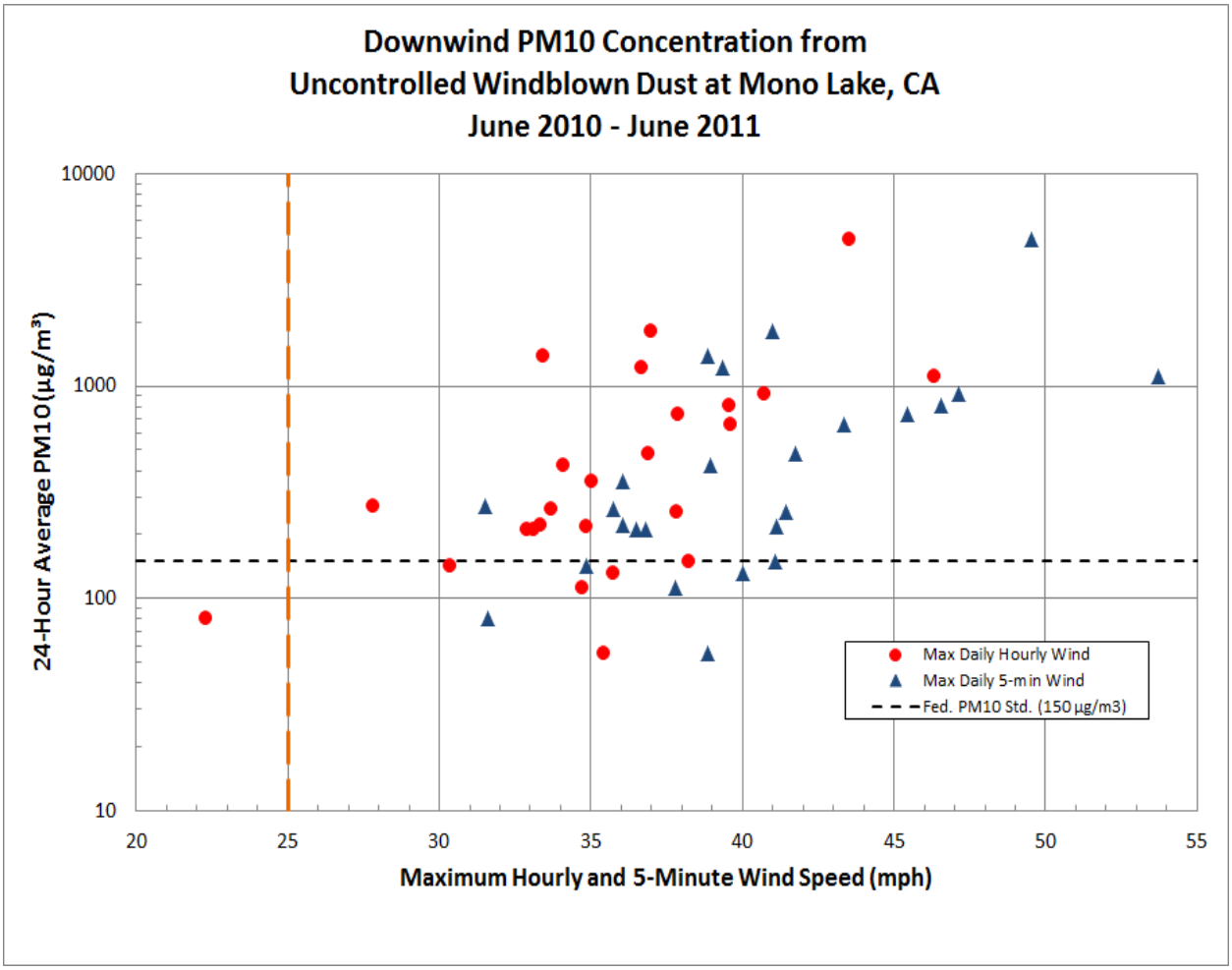

Figure 1. Maximum daily 5-minute winds were over 30 miles per hour (mph) for days that caused federal PM_{10} exceedances from the uncontrolled surfaces at Mono Lake, CA, which in 2009 had the highest PM_{10} concentrations in the country.

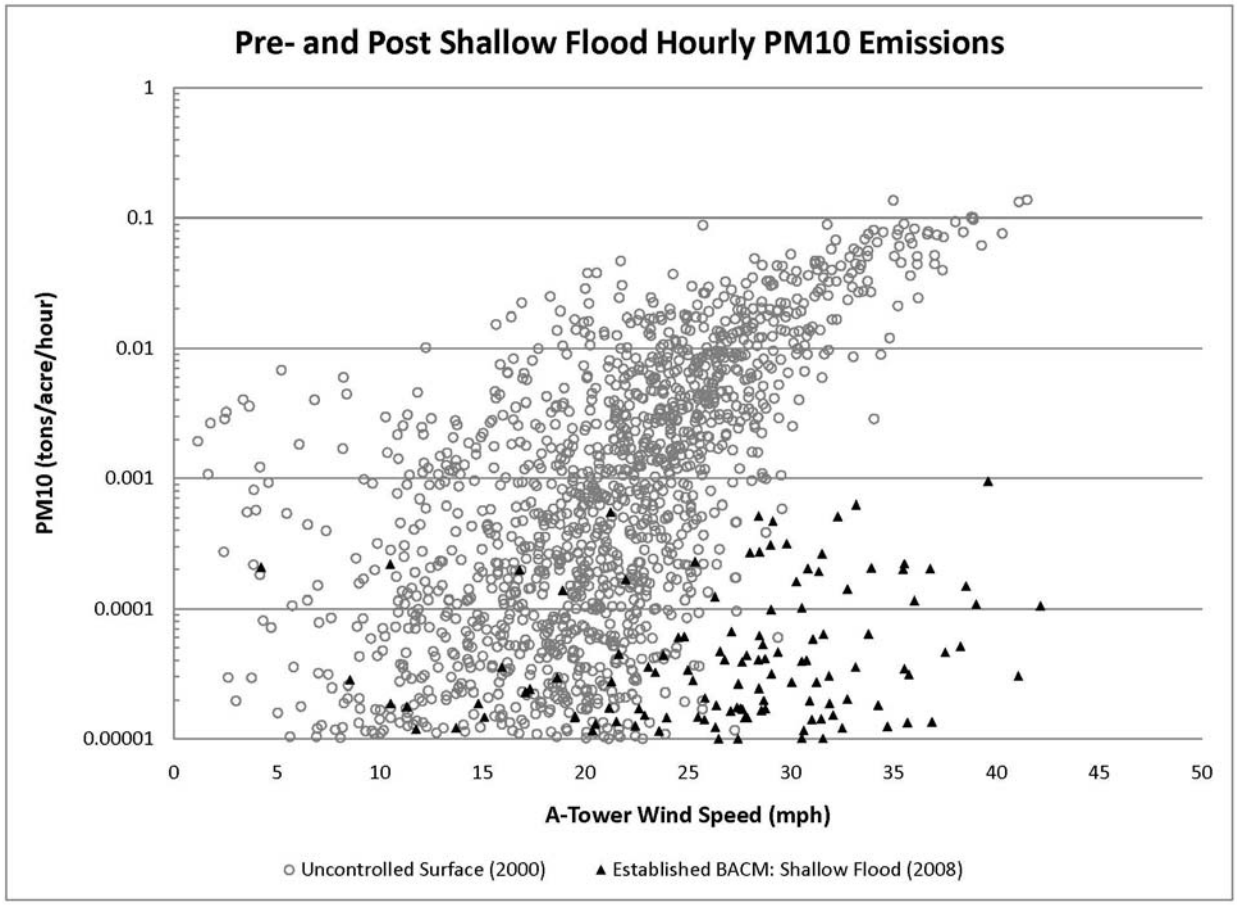

Figure 2. PM_{10} emissions from the areas on Owens Lake on which the **Shallow Flooding** BACM was deployed. The graph shows emissions prior to and after BACM deployment. It can be seen that BACM generally reduced emissions by 2 orders of magnitude or the 99% reduction required to meet the PM_{10} standard.

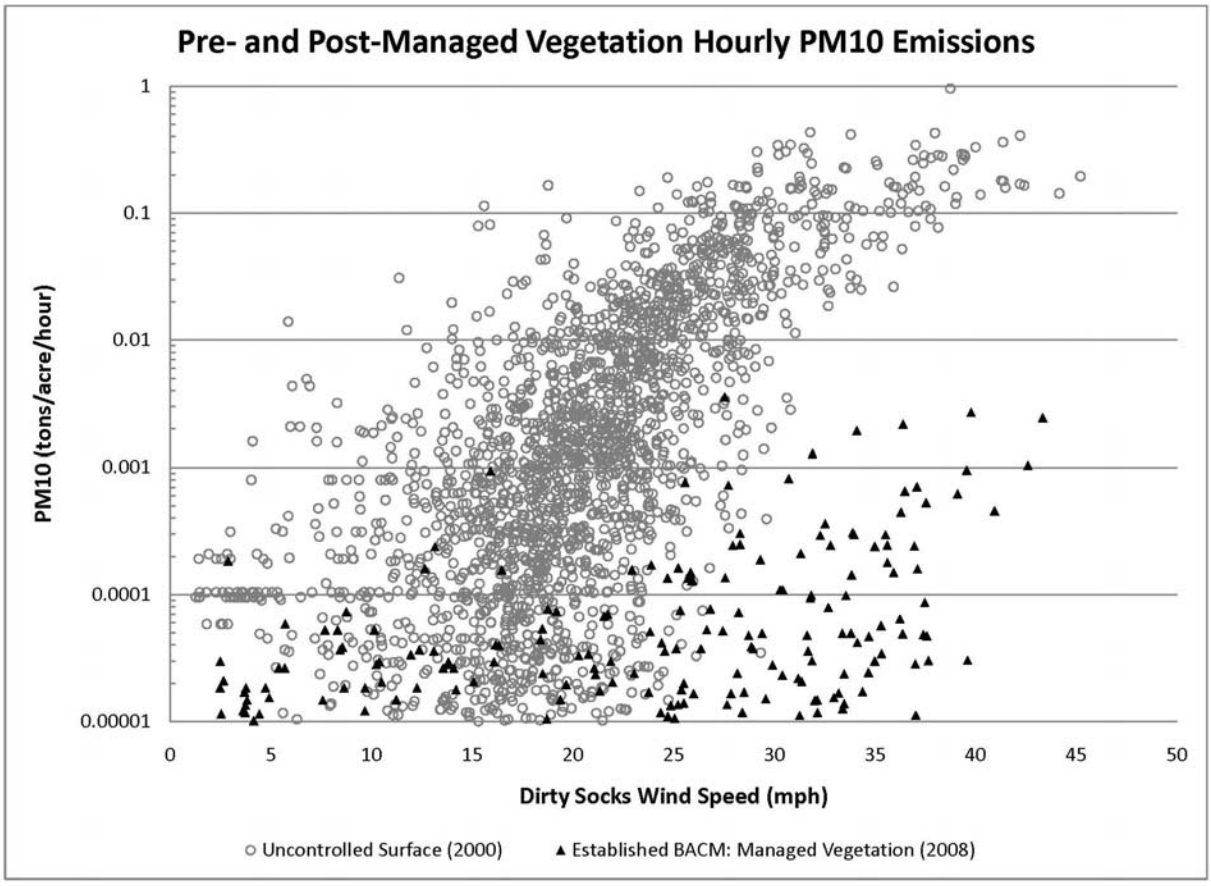

Figure 3. PM_{10} emissions from the areas on Owens Lake on which the **Managed Vegetation** BACM was deployed. The graph shows emissions prior to and after BACM deployment. It can be seen that BACM generally reduced emissions at least 2 orders of magnitude or the 99% reduction required to meet the PM_{10} standard.

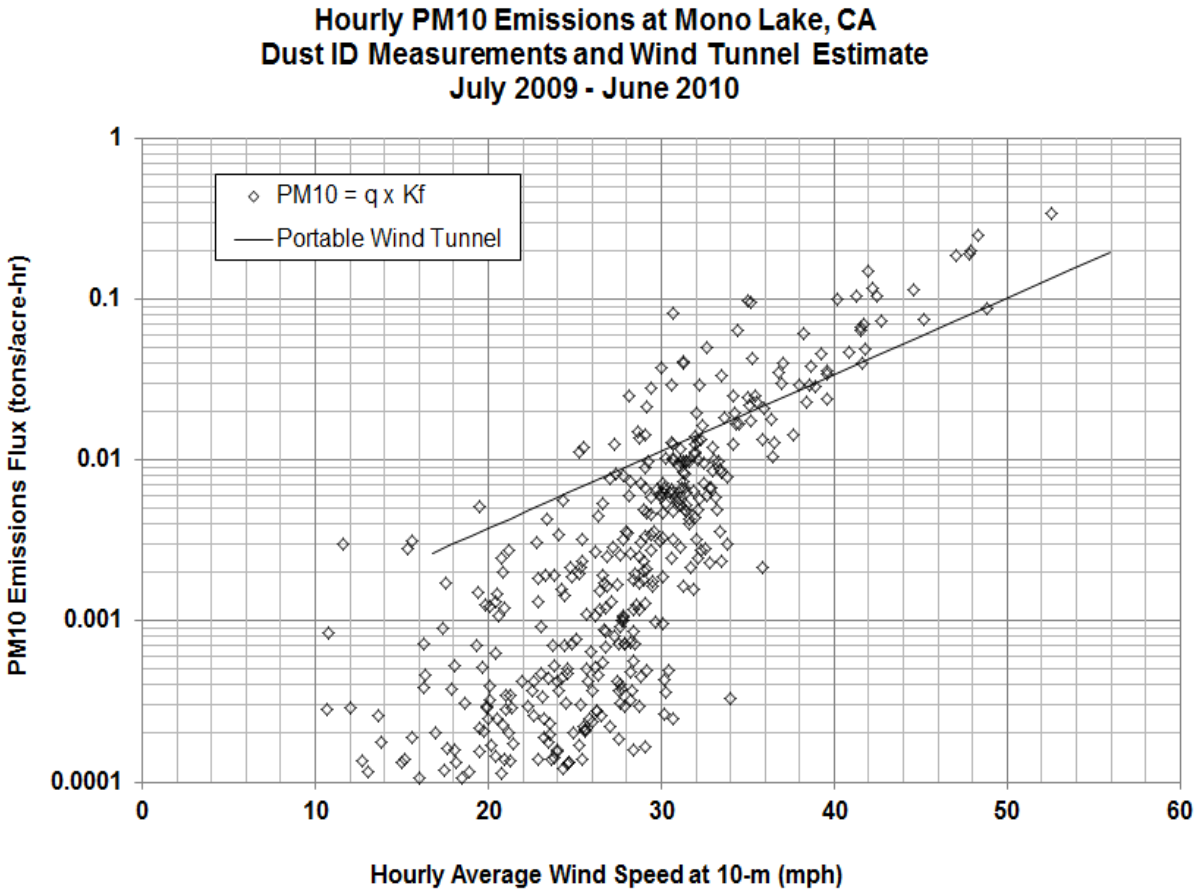

Figure 4. An algorithm based on portable wind tunnel tests at Mono Lake, CA was applied to an uncontrolled playa area above the northshore of Mono Lake. The wind tunnel algorithm largely overestimated windblown dust emissions for wind speeds below 30 miles per hour and underestimated emissions for wind speeds above 35 mph as compared to measured emissions from this open playa area.