



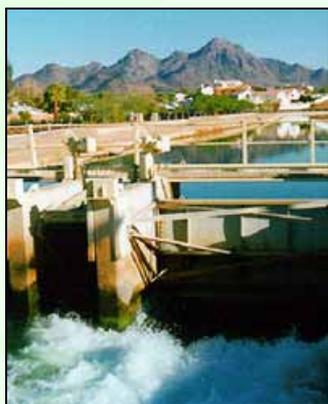
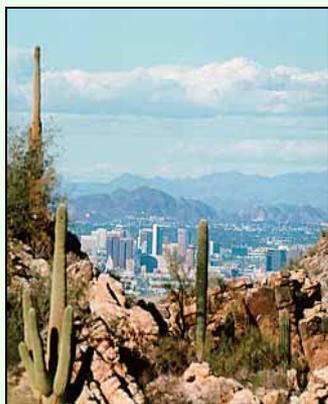
Review of Draft EPA Guidance Documents on the Implementation of the Exceptional Events Rule

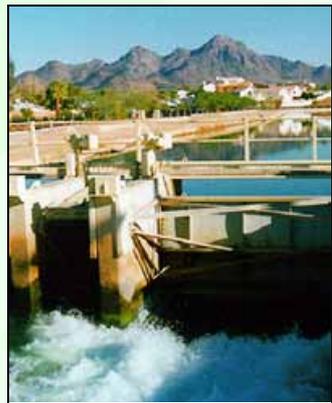
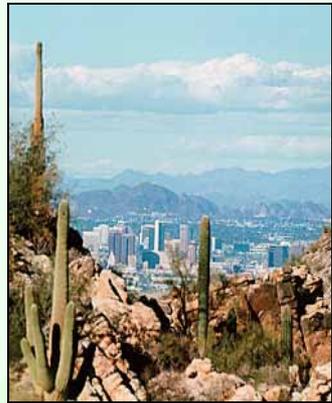
MAG Air Quality Technical Advisory Committee

May 24, 2011

EPA Guidance Documents

- n **On May 2, 2011 EPA released draft guidance documents related to the implementation of the exceptional events rule for state and local air agency review**
 - l “Overview of Draft Guidance Documents on the Implementation of the Exceptional Events Rule”
 - l “Exceptional Events Rule Frequently Asked Questions”
 - l “Guidance on the Preparation of Demonstrations in Support of Requests to Exclude Ambient Air Quality Data Affected by High winds under the Exceptional Events Rule”
- n **State and local agency comments due to EPA by June 30, 2011.**
- n **EPA states the documentation is based on the following principles:**
 - l States should not be held accountable for exceedances due to events that were beyond their control at the time of the event
 - l It is desirable to implement reasonable controls to protect public health
 - l Clear expectations will enable EPA and other air agencies to better manage resources related to the exceptional events process



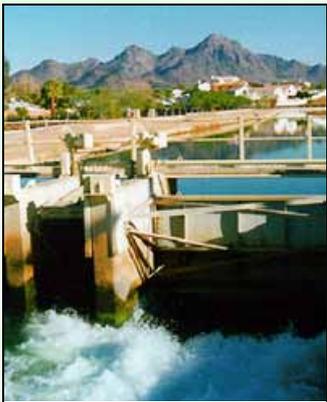
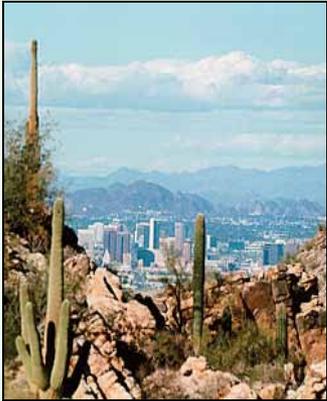


Technical Elements That Must be Met

- n **Whether the event affects air quality**
- n **Whether the event was caused by human activity unlikely to recur at a particular location, or was a natural event**
- n **Whether the event was not reasonably controllable or preventable**
 - l Adequacy and implementation status of existing controls
- n **Whether there was a clear causal relationship between the event and the measured concentration**
 - l Concentration must be linked to uncontrollable sources
- n **Whether there would have been no exceedance but for the event**
 - l Event must be tipping point in causing the exceedance
- n **Whether the event was associated with measured concentrations in excess of normal historical fluctuations including background**
 - l Magnitude and rarity of the event

Not Reasonably Controllable or Preventable

- n **“If a set of control measures could reasonably have been in place for contributing sources at the time of the event, then they must have been in place for the event to qualify as an exceptional event under the EER.”**
 - i “RACM/BACM lists may be a reference point, but not the sole means, by which EPA assesses the reasonableness of controls. In areas where events continue to recur, EPA may consider BACM, or greater levels of control, as the appropriate starting point, regardless of attainment status.”
- n **“In evaluating reasonableness, EPA will generally consider first and foremost whether the wind speeds were above the minimum threshold [25 mph] to entrain dust from stable surfaces.”**
- n **“More stringent controls are reasonable if an area experiences frequent and/or severe exceptional event exceedances due to high winds than if the area has experienced only rare/and or mild isolated exceedances...For recurring high wind dust events...states are expected to consider and implement further controls as events continue to recur.”**





Not Reasonably Controllable or Preventable

- n Magnitude of wind speed and frequency of event recurrence determine complexity of analysis

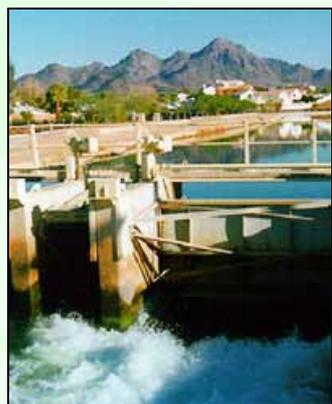
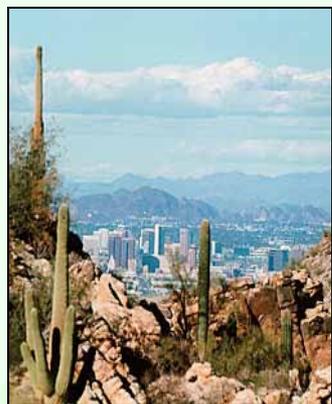
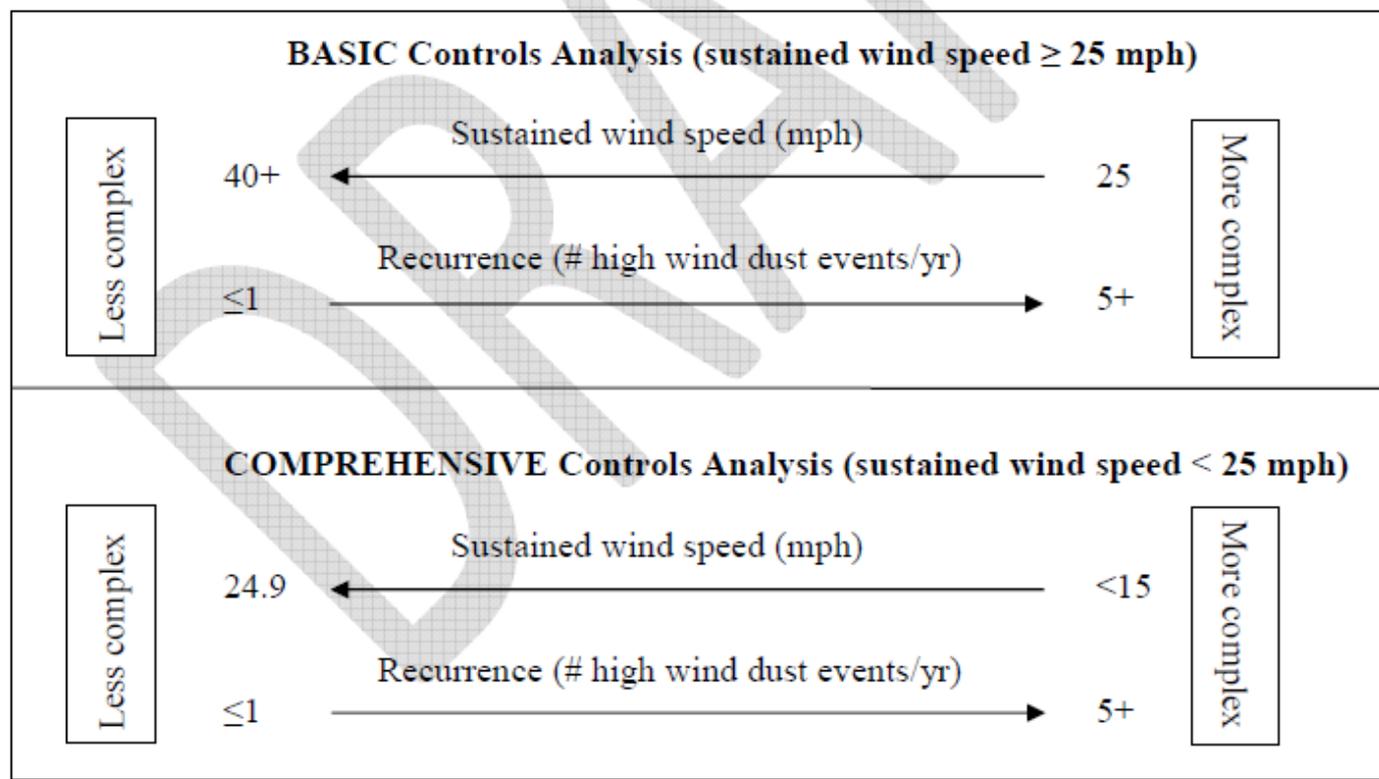


Figure 1. Complexity of Controls Analysis Based on Wind Speed and Concurrence



Not Reasonably Controllable or Preventable

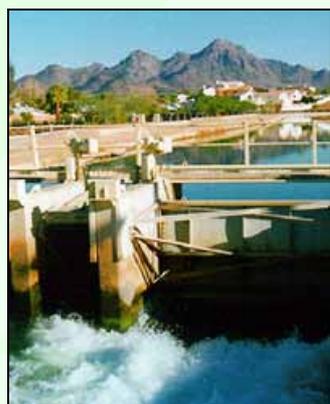
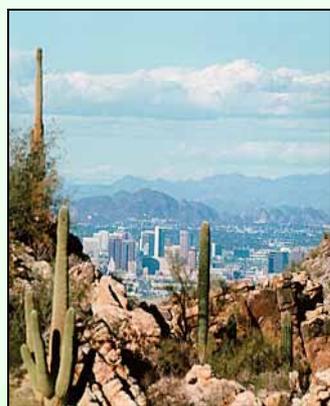


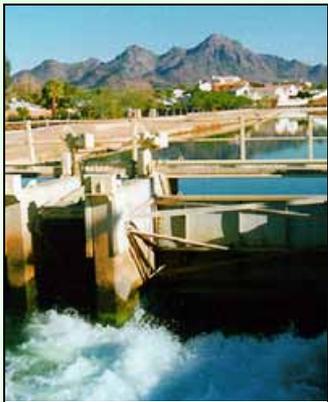
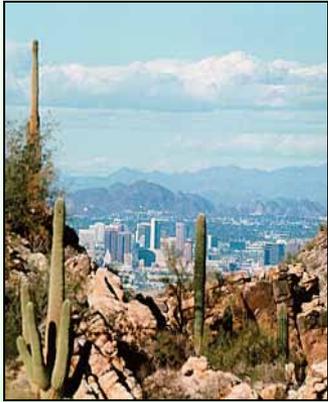
Table 3. Summary of Recommended Controls Analysis Elements for not Reasonably Controllable or Preventable Demonstration

Control Analysis Elements	Basic Controls Analysis (wind speed \geq 25 mph)		Comprehensive Controls Analysis (wind speed $<$ 25 mph)	
	Non-recurring	Recurring	Non-recurring	Recurring
Identification of local/upwind contributing sources	X	X*	X	X*
Anthropogenic sources – description of controls	X	X*	X	X*
Natural sources – statement regarding reasonableness of controls	X	X*	X	X*
Explanation of how entrainment occurred despite controls	X	X	X	X
Identification and implementation status of controls previously recommended by EPA, if applicable	X	X	X	X
Evidence of effective implementation and enforcement of controls			X	X
Back trajectories of source area			X	X
Source apportionment				X
Source-specific emissions inventories			X	X
Meteorological data associated with measured concentration			X	X

*Indicates that additional detail should be included beyond that for non-recurring cases

Not Reasonably Controllable or Preventable

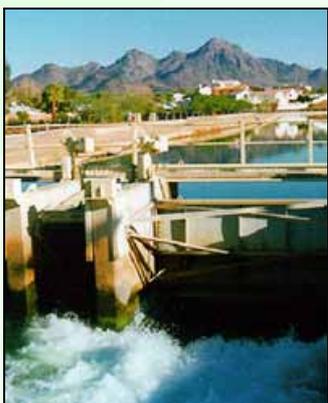
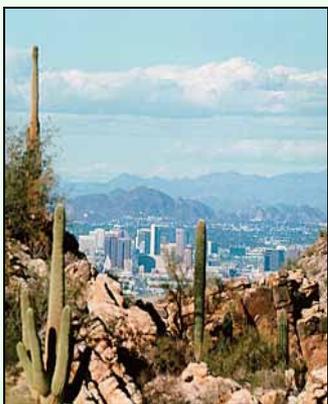
- n **High Wind Action Plan – a means to address areas with recurring events**
 - | Recurrence defined as more than one event per year, averaged over a 3-year period
 - | “EPA and the submitting state can consider the development of a High Wind Action Plan that would identify mutually agreed upon reasonable controls that a state could implement for subsequent high wind events...EPA would consider the controls to be reasonable as long as the events do not recur...If events recur, EPA will need to re-approve the High Wind Action Plan.”
 - | Plan needs to be open for public comment, requires EPA approval, State must implement identified controls and EPA formally recognizes that the plan is being implemented



ENVIRONMENTAL
PROGRAMS

Clear Causal Relationship

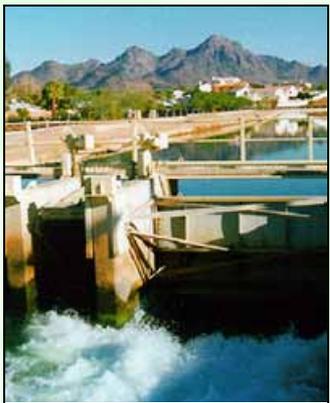
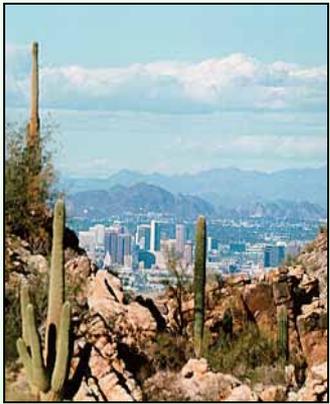
- n **"The demonstration must show that elevated concentrations were caused by dust entrained by high winds. The sources of dust implicated by the demonstration should be shown to be not reasonably controllable or preventable."**
- n **"A correlation between high wind and high concentrations is important but does not independently demonstrate that the high concentrations were caused by wind-entrained dust from the sources that were addressed as part of the not reasonably controllable or preventable demonstration."**
- n **Types of analyses necessary include:**
 - l Geographic extent of occurrence, transport of emissions, spatial and temporal relationships of concentrations, chemical speciation, comparison to surrounding days and historical data





Clear Causal Relationship

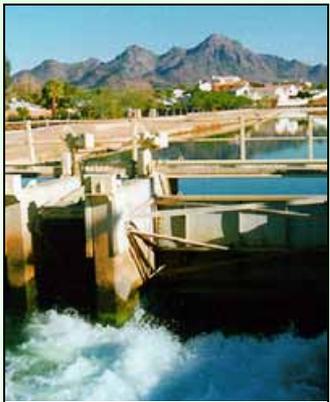
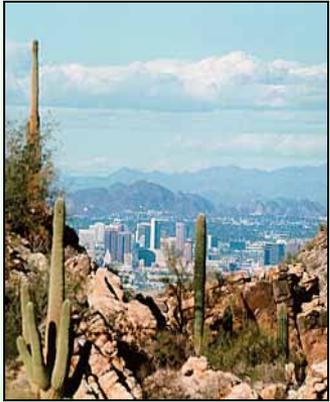
- n **"A demonstration will be less compelling if there is evidence that is not consistent with the conceptual model of the how the event caused the exceedance. For example, a hypothesis that an exceedance was caused by a large-scale wind event is inconsistent with a situation where an isolated monitor exceeds while nearby monitors do not. Comparison of concentrations and conditions at other monitors could thus be very important for the demonstration of a clear causal relationship."**
- n **In summary, the clear causal relationship must link the high concentrations to natural sources or anthropogenic sources that have been reasonably controlled. If there is any hint that anthropogenic sources were not reasonably controlled during the event, EPA will be unlikely to concur with the event.**



ENVIRONMENTAL
PROGRAMS

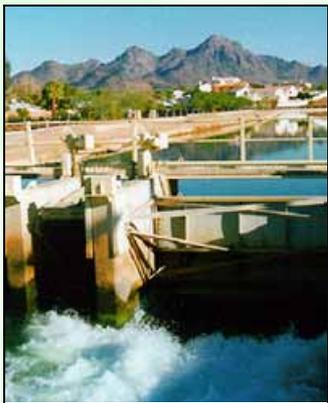
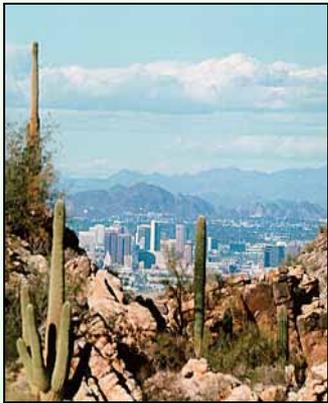
No Exceedance but for the Event

- n **A analysis showing the an exceedance would not have occurred but for the event**
 - l No quantitative examples provided by EPA
 - l A qualitative analysis may be acceptable in some cases
- n **This analysis is largely tied to the strength of the clear causal relationship and not reasonable controllable or preventable demonstrations. The stronger those are, the less analysis is needed for this element.**



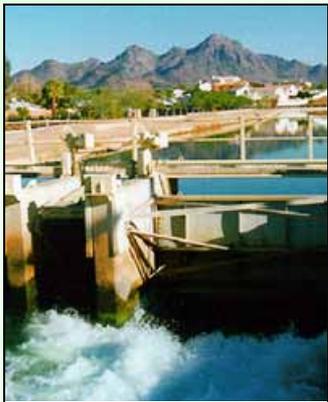
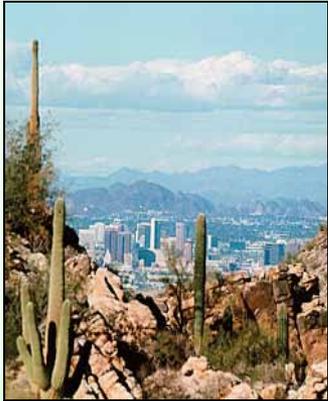
Historical Fluctuations

- n **"The more that a concentration that is temporally associated with an event stands out from historical concentrations, the more plausible it is that the event was the cause of a substantial portion of the concentration."**
- n **A particular threshold has not been established by EPA (i.e., percentile concentration) but rather the following types of analyses need to be presented:**
 - l Time series for concentration and wind data for the event area, 3-5 year duration, with event days identified
 - l Percentile of concentration relative to annual data
 - l Percentile of concentration relative to seasonal data



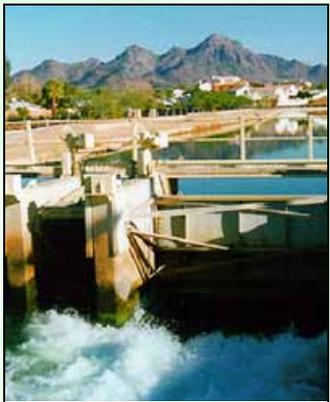
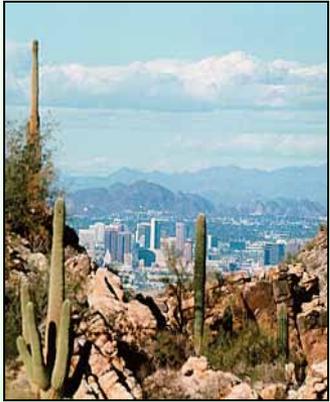
Affects Air Quality and is a Natural Event

- n These two elements are satisfied by meeting the requirements of the clear causal relationship and not reasonably controllable or preventable demonstrations; EPA requires no additional analyses to meet these elements.



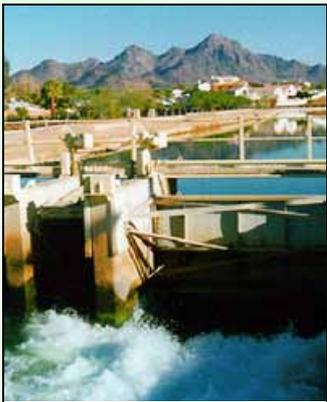
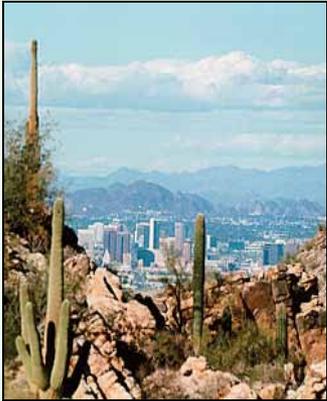
Other Items Included in High Wind Guidance

- n **A schedule outlining the steps/timing for submittal and approval of exceptional event packages.**
 - i EPA plans to respond initially within 120 days of state submittal. Additional analysis may be requested by EPA. For packages that impact a regulatory decision EPA plans to make a decision on concurrence within 18 months of receipt of the complete submittal.
- n **Example demonstrations of the technical elements required by the exceptional events rule**
- n **Appendix explaining the use of the 25 mph threshold.**



Comments on High Wind Guidance Documents

- n **Not reasonable controllable or preventable element:**
 - l No guarantee that existing controls in the SIP would be considered sufficient to satisfy this requirement, even if controls are BACM or MSM. EPA may require ever-increasing controls as no de minimis level for sources is set.
 - l EPA has set up a quota system with regards to how many high wind events EPA expects to see before additional controls will be evaluated (no more than 1 a year over 3-year average). Additional controls will be evaluated and even may be required for recurring events even if wind speeds are above the threshold of 25 mph. Natural sources may even require controls under this scenario. This is outside the scope and purpose of the Exceptional Events Rule.
 - l High Wind Action Plan only seems to be valid if exceptional events do not recur. The opposite should be true, a High Wind Action Plan should make it easier for a state to claim all controls were in place so that recurring events do not penalize the state.



Comments on High Wind Guidance Documents

n **Not reasonable controllable or preventable element:**

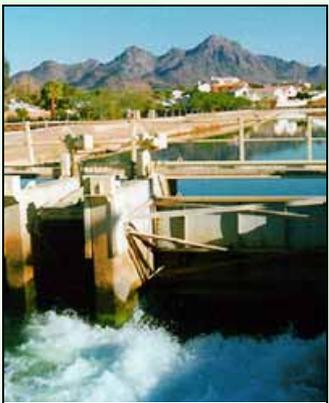
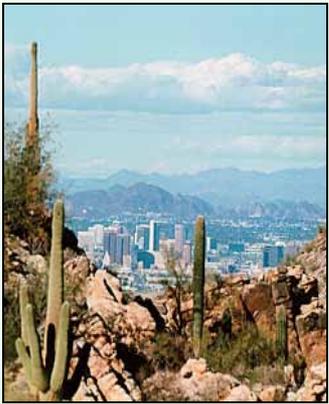
i 25 mph threshold:

n Technical issues abound with this threshold including measurement differences between meteorological stations and the role of surface roughness – example table below of stations approximately 3 miles apart

Date	Hour	MCAQD Wind Speed (Central Phoenix)	NWS Wind Speed (Sky Harbor)
9/11/08	18:00	20 mph hourly 28 mph high 5-minute	39 mph 2-minute
11/9/08	17:00	15 mph hourly 18 mph high 5-minute	25 mph 2-minute

Effects of surface roughness:

Wind Shear (cm/s)	Surface roughness value (cm)	10-meter wind speed (mph)
40.0	0.001	30.9
40.0	0.01	25.8
40.0	0.1	20.6
40.0	1.0	15.5

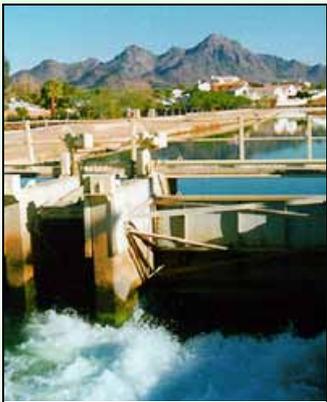
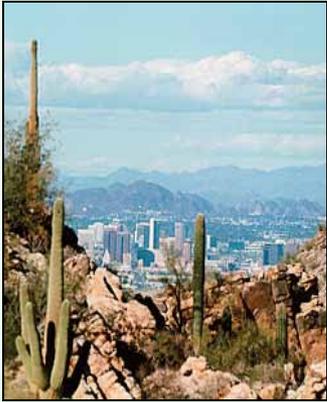


Comments on High Wind Guidance Documents

n **Not reasonable controllable or preventable element:**

l 25 mph threshold:

- n Unlikely EPA will approve lower threshold for Maricopa County as EPA interprets Arizona wind tunnel test to be consistent with the 25 mph threshold
- n Threshold of dust creation is lower than 25 mph (12 mph for Maricopa County), but EPA is evaluating the point at which dust emissions dramatically increase instead of initial threshold
- n Studies cited by EPA concern only the horizontal movement (saltation) of soil in relation to wind velocity thresholds. Dust creation (vertical fluxes) thresholds have been shown to be much lower than saltation (50 to 75%) and can occur in the absence of saltation.
- n Other jurisdiction have reported lower threshold velocities for the creation of dust – San Joaquin Valley begins at 18 mph and Imperial Valley begins at 15 mph (as quoted in a Mojave County exceptional event submittal).





Comments on High Wind Guidance Documents

- n **Not reasonable controllable or preventable element:**
 - i 25 mph threshold:
 - n EPA presumes that windblown dust from wind speeds under 25 mph must be only from disturbed soils or anthropogenic activity. Clark County data cited by EPA does not support this assumption.

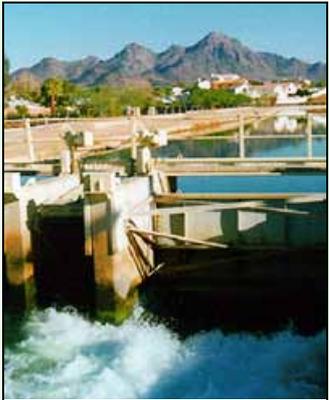
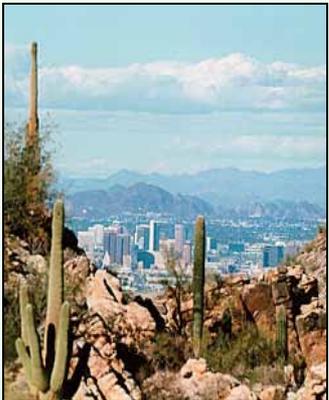
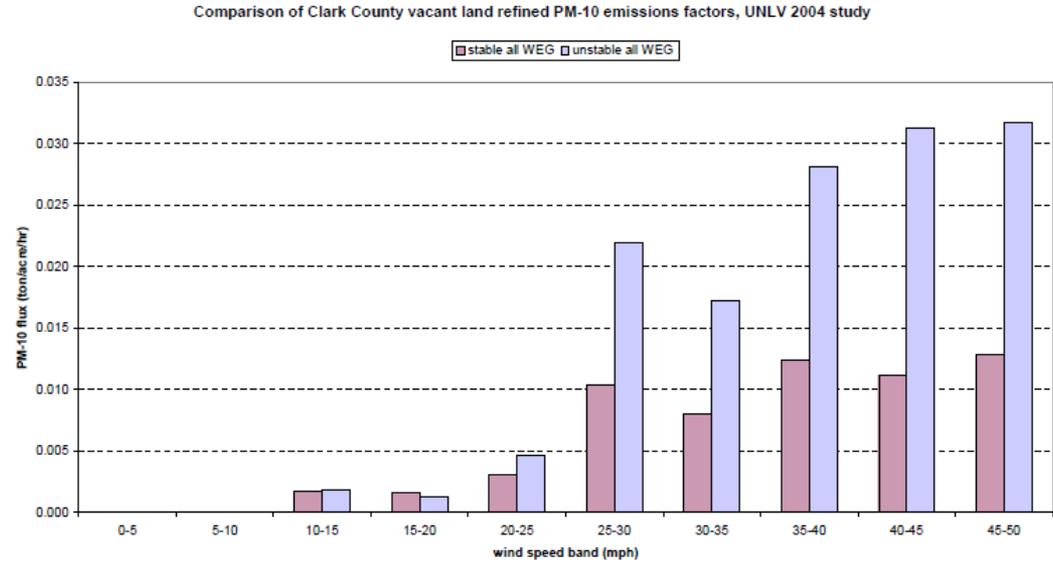


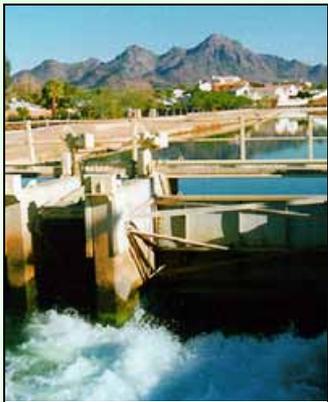
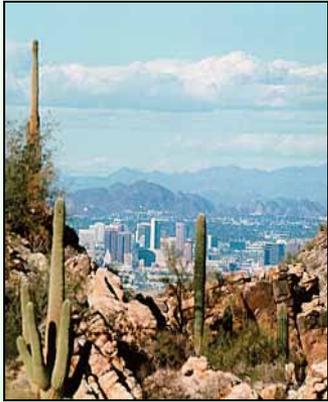
Figure ES-1 – Summary of wind-blown geometric mean PM-10 Emissions factors, averaged over all wind erodibility groups. UNLV 2004 wind tunnel field study. Error bars omitted to clarify differences between wind speed bands.



Comments on High Wind Guidance Documents

n **Clear causal relationship:**

- | EPA implies isolated monitor exceedances do not represent an exceptional event. Other jurisdictions have submitted single monitor exceedances for review – Clark County Nevada (May 21, 2008); San Joaquin Valley Air Pollution Control District (January 4, 2008); South Coast Air Quality Management District (October 13, 2008)
- | County in effect is penalized for having a dense PM-10 network. Beggars the question of “What distance between monitors is required by EPA before a single monitor exceedance will be approved by EPA?”
- | Dust production is not homogenous but rather linked to hot spots that can change over time through meteorological and anthropogenic influences





For More Information

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