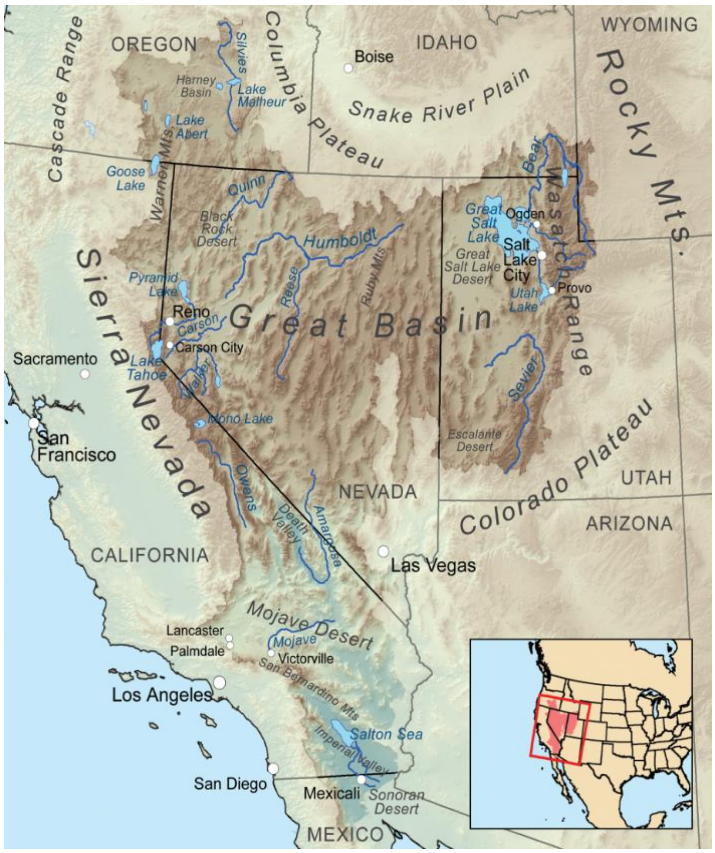
IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT



https://deepgreenresistancegreatbasin.org/resistance-culture/movement-building/deep-green-resistance-great-basin-land/

March 17, 2014
Exceptional Event Documentation
For the Imperial County PM_{10} Nonattainment Area

FINAL REPORT

February 3, 2017

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ACRONYM	DESCRIPTIONS
AQI	Air Quality Index
AQS	Air Quality System
BACM	Best Available Control Measures
BAM 1020	Beta Attenuation Monitor Model 1020
BLM	United States Bureau of Land Management
BP	United States Border Patrol
CAA	Clean Air Act
CARB	California Air Resources Board
CMP	Conservation Management Practice
DCP	Dust Control Plan
DPR	California Department of Parks and Recreation
EER	Exceptional Events Rule
EPA	Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
GOES-W/E	Geostationary Operational Environmental Satellite (West/East)
HF	Historical Fluctuations
HYSPLIT	Hybrid Single Particle Lagrangian Integrated Trajectory Model
ICAPCD	Imperial County Air Pollution Control District
ITCZ	Inter Tropical Convergence Zone
KBLH	Blythe Airport
KCZZ	Campo Airport
KIPL	Imperial County Airport
KNJK	El Centro Naval Air Station
KNYL/MCAS	Yuma Marine Corps Air Station
KPSP	Palm Springs International Airport
KTRM	Jacqueline Cochran Regional Airport (aka Desert Resorts Rgnl Airport)
LST	Local Standard Time
MMML/MXL	Mexicali, Mexico Airport
MPH	Miles Per Hour
MST	Mountain Standard Time
NAAQS	National Ambient Air Quality Standard
NCAR	National Center for Atmospheric Research
NCEI	National Centers for Environmental Information
NEAP	Natural Events Action Plan
NEXRAD	Next-Generation Radar
NOAA	National Oceanic and Atmospheric Administration
nRCP	Not Reasonably Controllable or Preventable
NWS	National Weather Service
PDT	Pacific Daylight Time
PM_{10}	Particulate Matter less than 10 microns
$PM_{2.5}$	Particulate Matter less than 2.5 microns

PST	Pacific Standard Time
QA/QC	Quality Assured and Quality Controlled
QCLCD	Quality Controlled Local Climatology Data
RACM	Reasonable Available Control Measure
RAWS	Remote Automated Weather Station
SIP	State Implementation Plan
SLAMS	State Local Ambient Air Monitoring Station
WRCC	Western Regional Climate Center

I Introduction

On March 17, 2014, a State and Local Ambient Air Monitoring Station (SLAMS) located in Brawley, California (AQS Site Code 06-025-0007), measured an exceedance of the National Ambient Air Quality Standard (NAAQS) when the Federal Equivalent Method (FEM), Beta Attenuation Monitor Model 1020 (BAM 1020 measured a 24-hr average (midnight to midnight) Particulate Matter less than 10 microns (PM_{10}) concentration of 190.9 µg/m^3. PM_{10} 24-hr measurements measured above the 150 µg/m^3 are exceedances of the NAAQS. The SLAMS in Brawley was the only station in Imperial County to measure an exceedance of the PM_{10} NAAQS on March 17, 2014.

TABLE 1-1
BRAWLEY CONCENTRATIONS OF PM_{10} ON MARCH 17, 2014

DATE	MONITORING SITE	AQS ID	POC(s)	HOURS	24-HOUR CONCENTRATION ug/m^3	PM_{10} NAAQS ug/m^3
3/17/2014	Brawley	06-025-0007	3	24	190.9	150

The Imperial County Air Pollution Control District (ICAPCD) has been submitting PM_{10} data from Federal Reference Method (FRM) Size-Selective Inlet (SSI) instruments since 1986 into the United States Environmental Protection Agency's (USEPA) Air Quality System (AQS). Most recently, since 2013 ICAPCD has been submitting continuous PM_{10} data from BAM 1020's. On March 17, 2014 the Brawley monitor was impacted by elevated particulate matter caused by the entrainment of fugitive windblown dust from high winds associated with a large low pressure system entering Imperial County.

This report demonstrates that the exceedance observed on March 17, 2014 was caused by a naturally occurring event which elevated particulate matter affecting air quality, was not reasonably controllable or preventable (nRCP), was in excess of normal historical fluctuations (HF) and would not have occurred "but for" the entrainment of fugitive windblown dust from outlaying deserts and mountains from the Sonoran Desert. The document further substantiates the request by the ICAPCD to flag a PM_{10} 24-hour NAAQS exceedance of 190.9 µg/m^3 as an exceptional event. This demonstration substantiates that this event meets the definition of the USEPA Regulation for the Treatment of Data Influenced by Exceptional Events (EER)[1].

I.1 Demonstration Contents

Section II - Describes the March 17, 2014 event as it occurred in California and into Imperial County, providing background information of the exceptional event and explaining how the event affected air quality. Overall, this section provides the evidence that the event was a natural event.

Section III - Describes the normal historical fluctuations using data charts, summaries, and time-

[1] "Treatment of Data Influenced by Exceptional Events; Final Rule", 72 FR 13560, March 22, 2007

series graphs, which demonstrate that the elevated concentrations of PM_{10} on March 17, 2014 were in excess of normal historical fluctuations.

Section IV - Provides evidence that the event of March 17, 2014 was not reasonably controllable or preventable despite the full enforcement and implementation of Best Available Control Measures (BACM).

Section V - Discusses and establishes the clear causal relationship between the exceedance at the Brawley station and the natural event, which occurred on March 17, 2014. This section provides evidence that the event affected air quality as a result of a natural event

Section VI - Brings together the evidence presented within this report and shows a clear causal relationship between the natural event, the exceedance and how BACM was overwhelmed making it nRCP concluding that the exceedance which occurred March 17, 2014 would not have occurred "but for" the natural event.

I.2 Requirement of the Exceptional Event Rule

The above sections combined comprise the technical requirements described under the Exceptional Events Rule (EER) under 40 CFR §50.14(c)(3)(iv). However, there are additional non-technical requirements that must be met in order for the USEPA to concur with flagged air quality monitoring data.

I.2.a Public Notification that a potential event was occurring

The ICAPCD and the National Weather Service (NWS) provided notification that winds 15 to 25 mph and gust to 35 miles per hour (mph) could affect this region, potentially elevating particulate matter. Due to the potential for suspended particles and poor air quality, the ICAPCD issued a "No Burn" day in Imperial County. **Appendix A** contains copies of the ICAPCD “No Burn” notice as it was issued on March 17, 2014 (Fig. A-2)**.**

I.2.b Notification to USEPA of the intent to exclude a measured violation (40 CFR §50.14(c)(2)(I))

States are required under federal regulation to submit measured ambient air quality data into the AQS. AQS is the federal repository of Quality Assured and Quality Controlled (QA/QC) air ambient data used for regulatory purposes. Ambient data that is potentially influenced by an exceptional event must be appropriately flagged and initially described and submitted to USEPA according to 40 CFR § 50.14(c)(2)(iii) no later than July 1st of the calendar year following the year in which the flagged measurement occurred.

The ICAPCD made a written request to the California Air Resources Board (CARB) to place preliminary flags on SLAMS measured concentrations in Brawley. The request, dated May 28, 2015 requested an initial flag for the measurement from the BAM 1020 in Brawley of 190.9

µg/m^3. A brief description was included with the initial flag of the meteorological data, which indicated a potential natural event had occurred on March 17, 2014.

I.2.c Documentation that the public comment process was followed for the event demonstration that was flagged for exclusion (40 CFR §50.14(c)(3)(v))

The ICAPCD posted, for a 30-day public review, a draft version of this demonstration on the ICAPCD webpage and published a notice of availability in the Imperial Valley Press on January 4, 2017. The notice advised the public that comments were being solicited regarding this demonstration, which supports the request, by the ICAPCD to exclude the measured concentration of 190.9 µg/m^3, which occurred on March 17, 2014 in Brawley. The final closing date for comments was February 3, 2017. **Appendix A** contains a copy of the public notice affidavit along with any comments received by the ICAPCD for submittal as part of the demonstration (40 CFR §50.14(c)(3)(i)).

I.2.d Documentation submittal supporting an Exceptional Event Flag (40 CFR §50.14(a)(1-2))

States that have flagged data as a result of an exceptional event and who have requested an exclusion of said flagged data are required to submit a demonstration that justifies the data exclusion to the USEPA no later than three years following the end of the calendar quarter in which the flagged concentration was measured or 12 months prior to the date that a regulatory decision must be made by USEPA.

The ICAPCD, after the close of the comment period and after consideration of the comments will submit this demonstration along with all required elements, including received comments and responses to USEPA Region 9 in San Francisco, California. The deadline for the submittal of this demonstration is March 31, 2017. However, it currently has regulatory implications for the PM_{10} SIP due in 2016.

I.2.e Necessary demonstration to justify an exclusion of data under (40 CFR§50.14(c)(3)(iv))

A This demonstration provides evidence that the event, as it occurred on March 17, 2014, satisfies the definition in 40 CFR §50.1(j) and (k) for an exceptional event.

- a The event “affects air quality”
- b The event “is not reasonably controllable or preventable.”
- c The event is “caused by human activity that is unlikely to recur at a particular location or [is] a natural event.”
- d The event is a “natural event” where human activity played little or no direct causal role.

B This demonstration provides evidence that air quality was affected by the exceptional event in Imperial County. There is a clear causal relationship between

the event and the measured concentrations in Brawley supporting that the event affected the air quality in Imperial County.

C This demonstration provides evidence that the measured concentration, caused by the event, is in excess of normal historical fluctuations.

D This demonstration provides evidence that “but-for” the event there would have been no exceedance (violation).

II March 17, 2014 Conceptual Model

This section provides a summary description of the meteorological and air quality conditions under which the March 17, 2014 event unfolded in Imperial County. The subsection elements include

- » A description and map of the geographic setting of the air quality and meteorological monitors
- » A description of Imperial County's climate
- » An overall description of meteorological and air quality conditions on the event day.

II.1 Geographic Setting and Monitor Locations

According to the United States Census Bureau, Imperial County has a total area of 4,482 square miles of which 4,177 square miles is land and 305 square miles is water. Much of Imperial County is below sea level and is part of the Colorado Desert, which is an extension of the larger Sonoran Desert (**Figure 2-1)**.

FIGURE 2-1
COLORADO DESERT AREA IMPERIAL COUNTY

Fig 2-1: 1997 California Environmental Resources Evaluation System. According to the United States Geological Survey (USGS) Western Ecological Research Center the Colorado Desert bioregion is part of the bigger Sonoran Desert Bioregion which includes the Colorado Desert and Upper Sonoran Desert sections of California and Arizona, and a portion of the Chihuahuan Basin and Range Section in Arizona and New Mexico (Forest Service 1994)

A notable feature in Imperial County is the Salton Sea, which is at 235 feet below sea level. The Chocolate Mountains are located east of the Salton Sea and extend in a northwest-southeast direction for approximately 60 miles (**Figure 2-2)**. In this region, the geology is dominated by the transition of the tectonic plate boundary from rift to fault. The southernmost strands of the San Andreas Fault connect the northern-most extensions of the East Pacific rise. Consequently, the region is subject to earthquakes and the crust is being stretched, resulting in a sinking of the terrain over time.

FIGURE 2-2
SURROUNDING AREAS OF THE SALTON SEA

Fig 2-2: Image courtesy of the Image Science and Analysis Laboratory NASA Johnson Space Center, Houston Texas

All of the seven incorporated cities, along with the unincorporated city of Niland, are surrounded by agricultural fields to the north, east, west, and south (Figure 2-3). Together, these communities and agricultural fields form what is known as the Imperial Valley. Surrounding the Imperial Valley are desert areas found on the eastern and western portions of Imperial County.

FIGURE 2-3
LOCATION AND TOPOGRAPHY OF IMPERIAL COUNTY

Fig 2-3: Depicts the seven incorporated cities within Imperial Valley - City of Calipatria, City of Westmorland, City of Brawley, City of Imperial, City of El Centro, City of Holtville, City of Calexico. Niland is unincorporated. Mexicali, Mexico is to the south

Furthermore, the Sonoran Desert located to the east and west of Imperial County expands to the southeast and southwest into Mexico (**Figure 2-4)**. Combined, these deserts areas are sources of dust emissions, which affect the Imperial County during high wind events.

FIGURE 2-4
DESERTS IN CALIFORNIA, YUMA AND MEXICO

Fig 2-4: Depicts the Sonoran Desert as it extends from Mexico into Imperial County. Source: Google Earth

Air quality and meteorological monitoring stations in southeastern California, northern Mexico, and southwestern Arizona are shown in **Figure 2-5**. SLAMS in Imperial County are located in Calexico, El Centro, Westmorland, Brawley, and Niland. Each station measures air quality and meteorological data; the station located in Brawley only measures air quality and no meteorological data. Other air monitoring stations with air quality and meteorological data used for this demonstration include stations in Riverside County and Arizona (**Figure 2-5 and Table 2-1)**.

As mentioned above, the PM_{10} exceedance on March 17, 2014, occurred at the Brawley station. The Brawley station is regarded as the "central" monitoring site within the Imperial County air monitoring network. In order to properly analyze the contributions of meteorological conditions occurring on March 17, 2014, other meteorological sites used in this demonstration include airports in eastern Riverside County, southeastern San Diego County, southwestern Yuma (Arizona) County, and Imperial County, along with other sites relevant to the wind event (**Figure 2-5)**.

FIGURE 2-5
MONITORING SITES IN AND AROUND IMPERIAL COUNTY

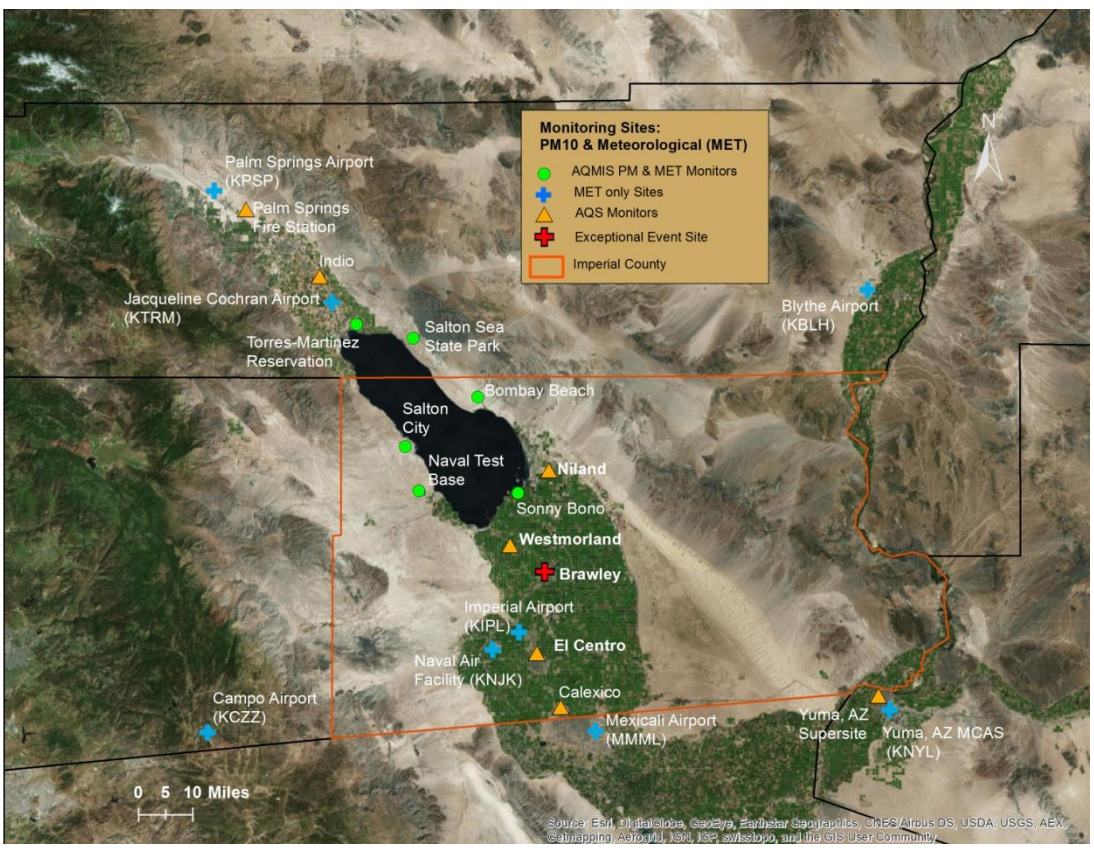


Fig 2-5: Depicts a select group of meteorological and PM10 monitoring sites in Imperial County, eastern Riverside County, southern San Diego County, southwestern Yuma (Arizona) County, and northern Mexico

TABLE 2-1
MONITORING SITES IN IMPERIAL COUNTY, RIVERSIDE COUNTY AND ARIZONA
MARCH 17, 2014

Monitor Site Name	Operator*	Monitor Type	AQS ID	AQS PARAMETER CODE	ARB Site Number	Elevation (meters)	24-hr PM_{10} (ug/m³) Avg	1-hr PM_{10} (ug/m³) Max	Time of Max Reading	Max Wind Gust (mph)	Time of Max Wind Gust
IMPERIAL COUNTY											
Calexico-Ethel Street	CARB	Hi-Vol Gravimetric	06-025-0005	(81102)	13698	3		-	-	-	-
El Centro-9th Street	ICAPCD	Hi-Vol Gravimetric	06-025-1003	(81102)	13694	9	-	-	-	11.7	16:00
Brawley-Main Street #2	ICAPCD	Hi-Vol Gravimetric	06-025-0007	(81102)	13701	N/A	-	-	-	-	-
		BAM 2010					190.9	656.4	16:00	-	-
Westmorland	ICAPCD	Hi-Vol Gravimetric	06-025-4003	(81102)	13697	-43	-	-	-	-	-
		BAM 2010					-	-	-	-	-
Niland-English Road	ICAPCD	Hi-Vol Gravimetric	06-025-4004	(81102)	13997	-54	-	-	-	-	-
		BAM 2010					88.3	329	18:00	18.1	17:00
RIVERSIDE COUNTY											
Palm Springs Fire Station	SCAQMD	TEOM	06-065-5001	(81102)	33137	174	66.6	352	19:00	27.6	18:00
Indio (Jackson St.)	SCAQMD	TEOM	06-065-2002	(81102)	33157	1	108	401	21:00	15	22:00
ARIZONA – YUMA											
Yuma Supersite	ADEQ	TEOM	04-027-8011	(81102)	N/A	N/A	65.5	140	23:00	15	15:00

CARB = California Air Resources Board
IID = Imperial Irrigation District
ICAPCD = Air Pollution Control District, Imperial County
SCAQMD = South Coast Air Management Quality District
ADEQ =Arizona Department of Environmental Quality

II.2 Climate

As mentioned above, Imperial County is part of the Colorado Desert, which is a subdivision of the larger Sonoran Desert (**Figure 2-6**) encompassing approximately 7 million acres (28,000 km^2). The desert area encompasses Imperial County and includes parts of San Diego County, Riverside County, and a small part of San Bernardino County.

FIGURE 2-6
SONORAN DESERT REGION

The Sonoran Desert Region consists of the Sonoran Desert itself plus the surrounding biological communities, including the Sea of Cortez (Gulf of California) and its islands

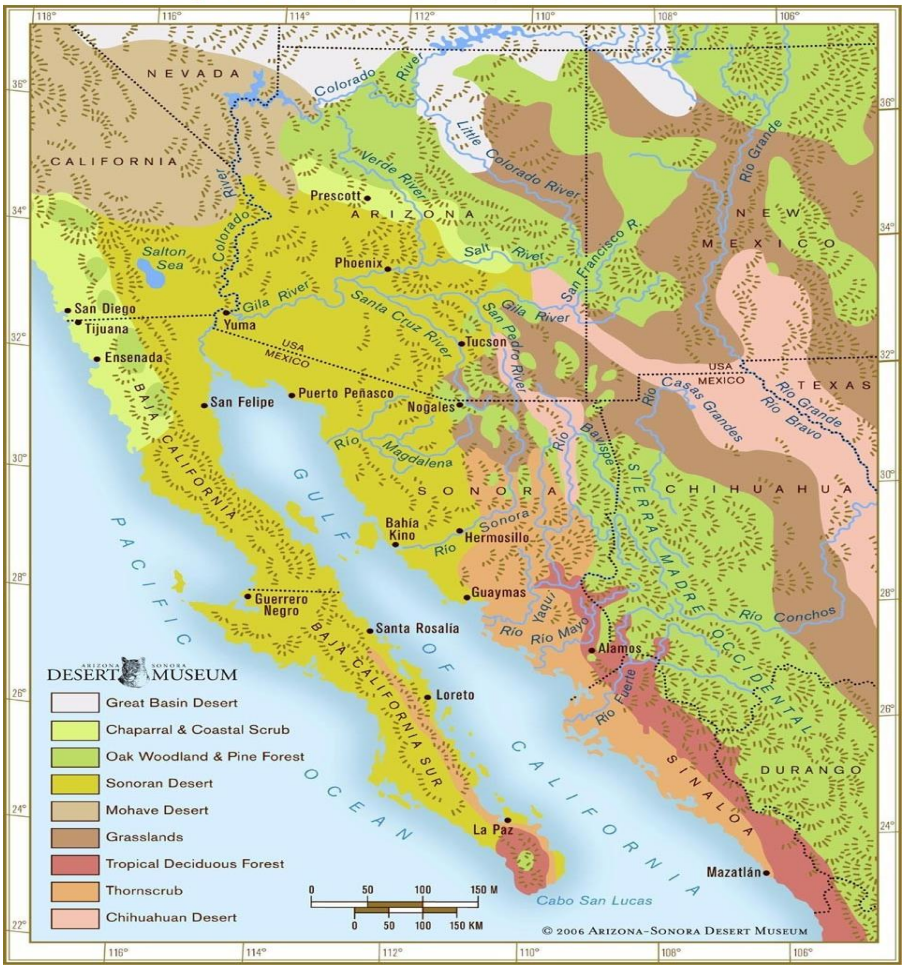


Fig 2-6: Depicts the magnitude of the region known as the Sonoran Desert. Source: Arizona-Sonora Desert Museum at http://desertmuseum.org/center/map.php

The majority of the Colorado Desert lies at a relatively low elevation, below 1,000 feet (300 m), with the lowest point of the desert floor at 275 feet (84 m) below sea level at the Salton Sea. Although the highest peaks of the Peninsular Range reach elevations of nearly 10,000 feet (3,000 m), most of the region's mountains do not exceed 3,000 feet (910 m).

In the Colorado Desert (Imperial County), the geology is dominated by the transition of the tectonic plate boundary from rift to fault. The southernmost strands of the San Andreas Fault connect to the northern-most extensions of the East Pacific Rise. Consequently, the region is subject to earthquakes, and the crust is being stretched, resulting in a sinking of the terrain over time.

The Colorado Desert's climate distinguishes it from other deserts. The region experiences greater

summer daytime temperatures than higher-elevation deserts and almost never experiences frost. In addition, the Colorado Desert experiences two rainy seasons per year (in the winter and late summer), especially toward the southern portion of the region; the more northerly Mojave Desert usually has only winter rains.

The west coast Peninsular Ranges, or other west ranges, of Southern California–northern Baja California, block most eastern Pacific coastal air and rains, producing an arid climate. Other short or longer-term weather events can move in from the Gulf of California to the south, and are often active in the summer monsoons. These include remnants of Pacific hurricanes, storms from the southern tropical jet stream, and the northern Inter Tropical Convergence Zone (ITCZ).

The arid nature of the region is demonstrated when historic annual average precipitation levels in Imperial County average 3.11" (**Figure 2-7)**. During the 12 month period prior to March 17, 2014, Imperial County recorded total annual precipitation of 2.14 inches. The arid conditions preceding the wind event on March 17 resulted in soils that were particularly susceptible to particulate suspension by the elevated gusty winds.

FIGURE 2-7
IMPERIAL COUNTY HISTORICAL WEATHER

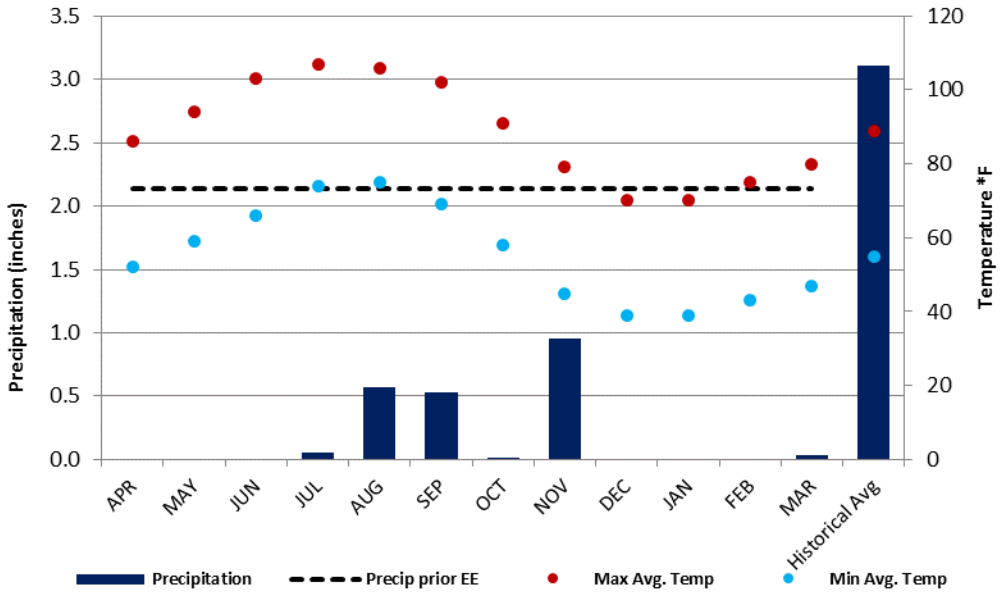


Fig 2-7: Prior to March 17, 2014, the region had suffered abnormally low precipitation of 2.14 inches. Average annual precipitation is 3.11 inches. Meteorological data courtesy of Weather Underground, California Observed Climate Normals, and Western Regional Climate Center (WRCC)

While windblown dust events in Imperial County during the summer monsoon season are often due to outflow winds from thunderstorms, windblown dust events in the fall, winter, and spring are usually due to strong winds associated with low-pressure systems and cold fronts moving

southeast across California. These winds are the result of strong surface pressure gradients between the approaching low-pressure system, accompanying cold front, and higher pressure ahead of it. As the low-pressure system and cold front approaches and passes, gusty southwesterly winds typically shift to northwesterly. The strong winds can loft dust into the air and transport it over long distances, especially if soils in the region are dry.

II.3 Event Day Summary

The exceptional event for March 17, 2014, was caused by a trough of low-pressure that moved southeastward from the Great Basin, and brought increased onshore flow across southern California. This resulted in strong and gusty westerly winds across the mountains and deserts of southeastern California. Westerly winds of 15 to 25 mph with gusts up to 35 mph were predicted for a wide area of southeastern California. The National Weather Service (NWS) issued wind advisories as far west as the mountains of San Bernardino and Riverside counties, along with the Coachella Valley northwest of Imperial Valley, and the mountains and deserts of San Diego County directly west of Imperial County (see forecasts and advisories in **Appendix A**). **Figure 2-8** and **Figure 2-9** show the low pressure dominating much of southern California.

FIGURE 2-8
DAILY WEATHER MAP - MARCH 17, 2014

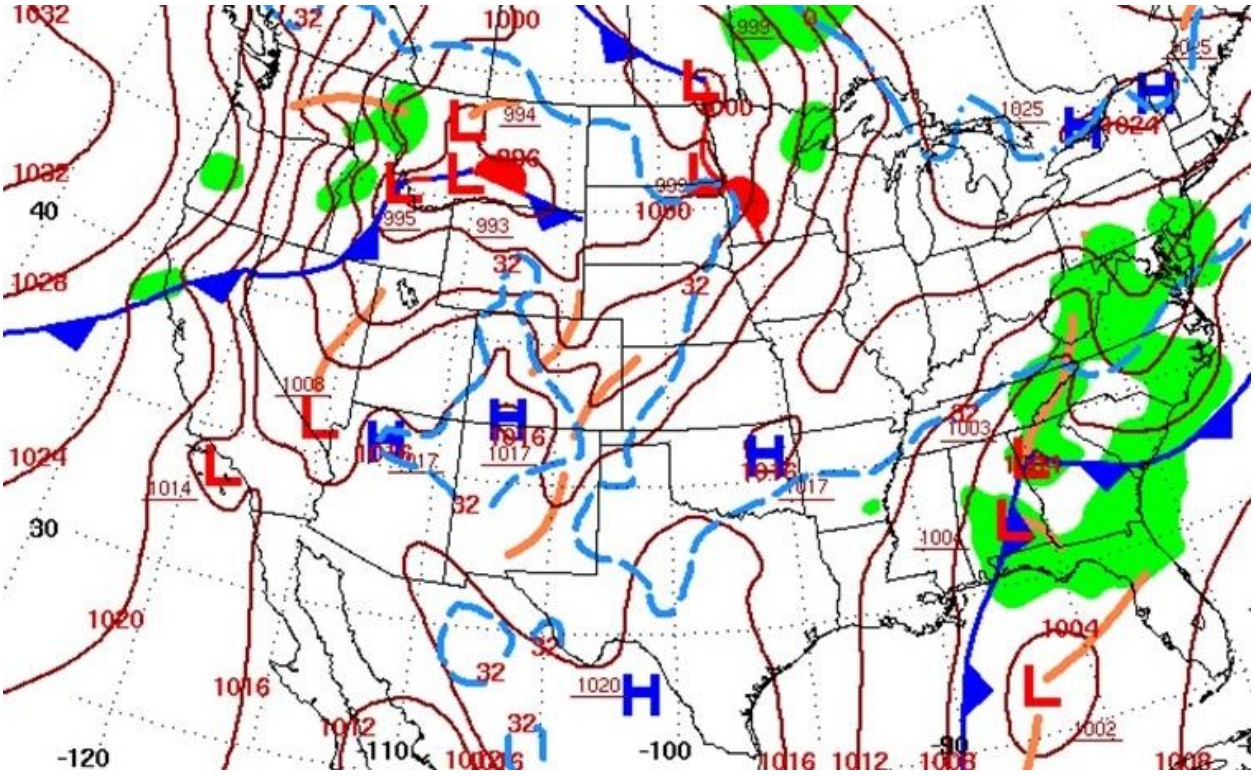


Fig 2-8: A daily weather map shows a large low pressure system dominating much of southern California and southern Nevada. Source: Weather Prediction Center

FIGURE 2-9
GOES-W SATELLITE IMAGES - MARCH 17, 2014

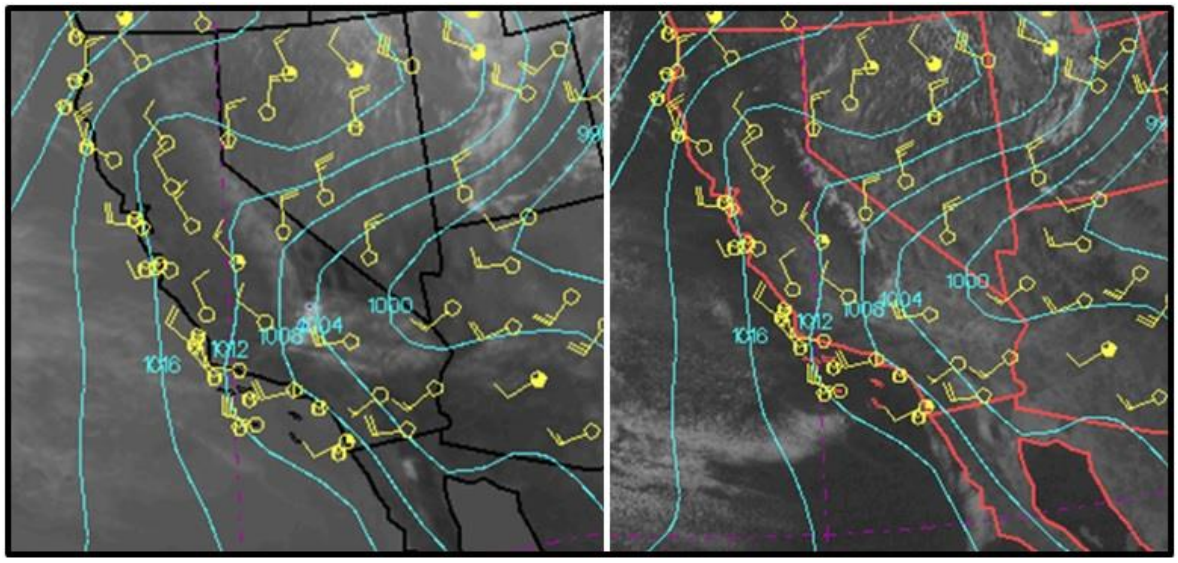


Fig 2-9: A pair of GOES-W satellite images (infrared, left and visible, right) captured at 17:00 PDT on March 17. Winds barbs indicate moderately strong winds from the west to west-southwest. Courtesy of SFSU Earth and Climate Sciences Department and the California Regional Weather Server

FIGURE 2-10
SATELLITE SURFACE COMPOSITE MAP - MARCH 17, 2014

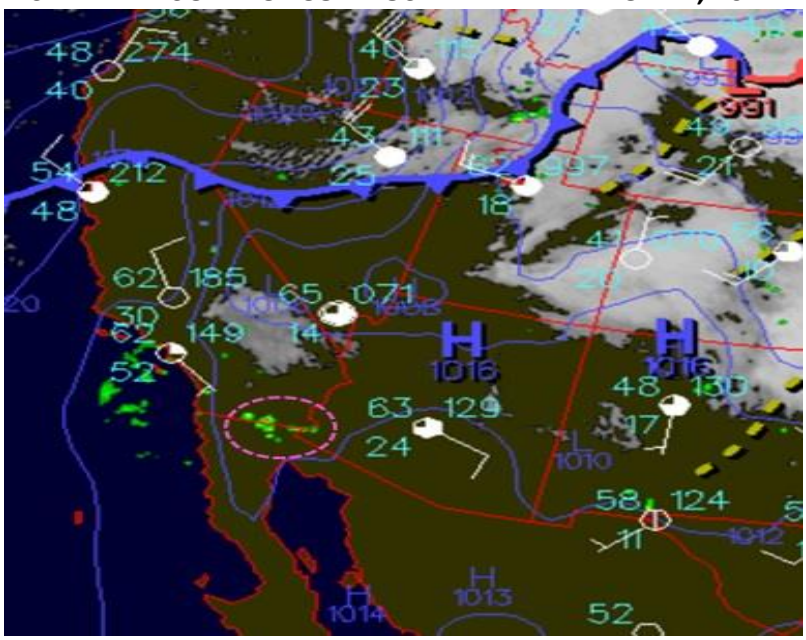


Fig 2-10: A satellite surface composite map (09:30 PDT) show a cluster of storm cells near Imperial County. These were associated with the weather system that brought gusty winds to Imperial County on March 17. Image courtesy of Unisys Corporation

The large low pressure system prompted the National Weather Service to issue a zone forecast for southwest winds 5 to 10 mph becoming west 15 to 25 mph in the afternoon, with possible gusts up to 35 mph, for March 17, 2014 **(see Appendix A)**. As the weather system moved into Imperial County, strong winds did in fact occur. The chain of events is visually demonstrated in **Figure 2-11**. In the morning hours of March 17, 2014, light to moderate variable winds (mostly south-southeast) prevailed at most sites in Imperial County. Beginning around 13:00, both wind direction and wind speed at Imperial County Airport experienced a robust change. Winds shifted to a west to west-southwest direction with sustained wind speeds rising to 14-21 mph and gusts up to 31 mph. Winds 20 to 26 mph and gusts up to 33 mph were measured at the El Centro Naval Air Facility.

FIGURE 2-11
RAMP-UP SEQUENCE FOR MARCH 17, 2014

Fig 2-11: The above graphic illustrates how winds were light and variable (mostly SSE) in the hours before the event. Around noon, wind direction shifted to the west west-southwest and speed increased. Powerful gusts were measured at local airfields. Brawley hourly PM_{10} concentrations remained elevated for almost all of the remainder of the day. Winds decreased starting late evening. By early next morning, PM_{10} levels began to decline

The strong westerly winds continued through the evening on March 17, 2014 in Imperial County. Over the course of the afternoon and rest the day, winds in excess of 20 and 25 mph were measured at a number of meteorological stations**.** Several stations, including the Palm Springs International Airport in Riverside County, the Naval Air Facility (KNJK) in Imperial County, and Imperial County Airport (KIPL), all recorded wind gusts over 30 mph. The El Centro Naval air Facility recorded wind gusts exceeding 33 mph. Winds started to diminish during late evening on March 17, 2014. **Table 2-2** is a summary of maximum winds, peak wind gusts, and wind direction at monitors in Imperial County, Riverside County, Yuma, Arizona, and Mexicali, Mexico. For detailed meteorological graphs per station see **Appendix B**.

TABLE 2-2
WIND SPEEDS ON MARCH 17, 2014

Station Monitor Airport Met Data	Maximum Wind Speed (WS) (mph)	Wind Direction during Max WS (degrees)	Time of Max Wind Speed (PST)	24 hr Maximum Wind Gust (WG) (mph)	Time of Max WG	PM_{10} correlated to time of Max Wind Speed	Hourly Maximum Observed PM_{10} (ug/m3)
Imperial Airport (KIPL)	21	270	14:00	31	15:00	-	-
Naval Air Facility (KNJK)	26	250	15:00	33	15:00	-	-
Calexico (Ethel St)	-	-	-	-	-	-	-
El Centro -9th Street	11.7	259	16:00	-	-	-	-
Westmorland	-	-	-	-	-	-	-
Niland	18.1	265	17:00	-	-	-	329
RIVERSIDE COUNTY							
Blythe Airport (KBLH)	20.7	230	17:00	27.6	15:00	-	-
Palm Springs Airport (KPSP)	27.6	310	18:00	34.5	18:00	292	352
Jacqueline Cochran Regional Airport (KTRM) - Thermal	20.7	330	19:00	32.2	20:00	-	-
ARIZONA – YUMA							
Yuma MCAS (KNYL)	13.8	240	13:00	13.8	13:00	41	140
MEXICALI - MEXICO							
Mexicali Int. Airport (MXL)	19.6	270	17:00	-	-	-	-

The National Oceanic and Atmospheric Administration (NOAA) Air Resources Laboratory HYSPLIT back-trajectory model[2], **Figure 2-12**, shows the path of air moved across arid, mostly barren regions to the west of Brawley in the hours preceding the exceedance. The six-hour back-trajectory model places shows air was over the source region several hours prior to the first significant spike in PM_{10} concentrations recorded by the Brawley FEM monitor.

[2] The Hybrid Single Particle Lagrangian Integrated Trajectory Model (**HYSPLIT**) is a computer model that is a complete system for computing simple air parcel trajectories to complex dispersion and deposition simulations. It is currently used to compute air parcel trajectories and dispersion or deposition of atmospheric pollutants. One popular use of HYSPLIT is to establish whether high levels of air pollution at one location are caused by transport of air contaminants from another location. HYSPLIT's back trajectories, combined with satellite images (for example, from NASA's MODIS satellites), can provide insight into whether high air pollution levels are caused by local air pollution sources or whether an air pollution problem was blown in on the wind The initial development was a result of a joint effort between NOAA and Australia's Bureau of Meteorology. Source: NOAA/Air Resources Laboratory, 2011.

FIGURE 2-12
HYSPLIT BACK-TRAJECTORY MODEL

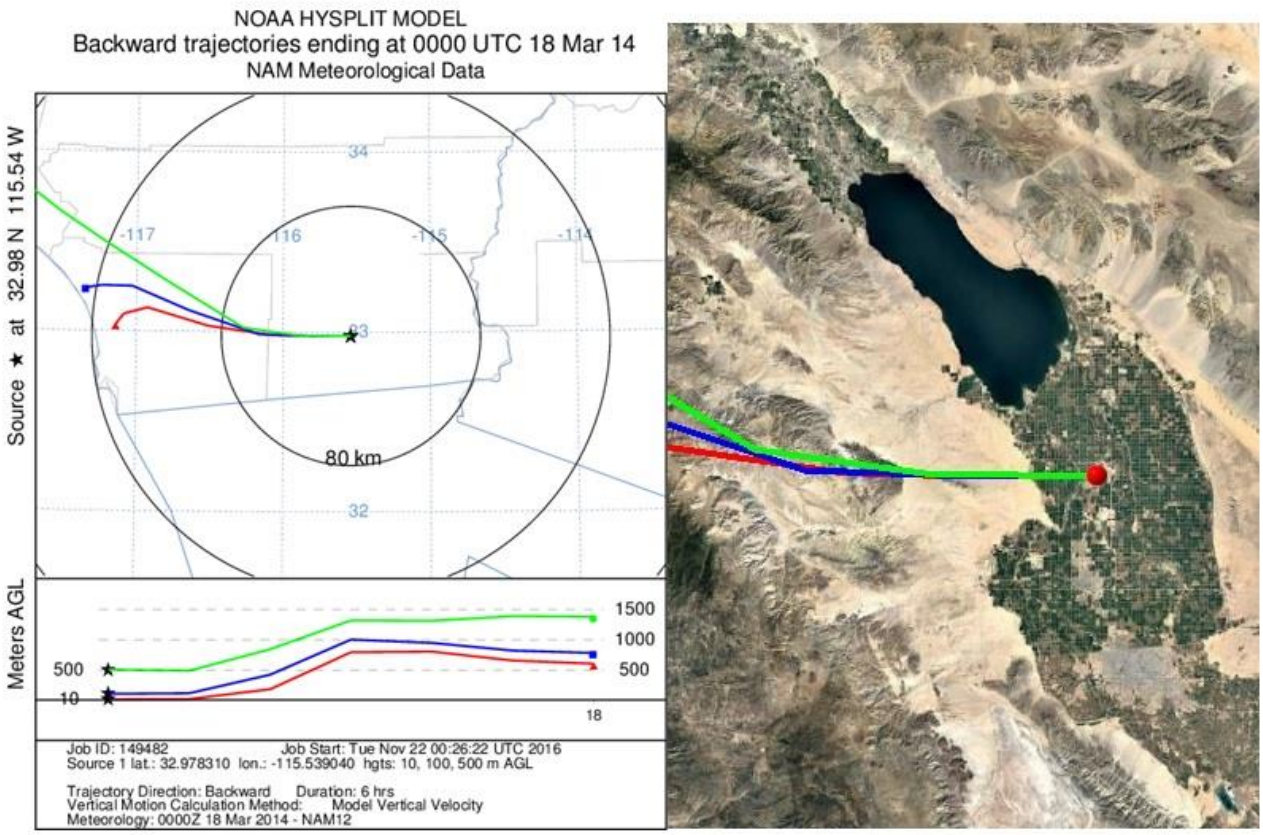


Fig 2-12: A six-hour back trajectory ending at Brawley at 16:00 PDT on March 17, 2014. Red line indicates airflow at 10 meters above ground level (AGL); blue=100 meters; green=500 meters AGL. It should be noted that modeled winds can differ substantially from local conditions. Data used in the HYSPLIT model has a horizontal resolution of 12 km and is integrated every three hours. Thus, the HYSPLIT model may differ from local observed surface wind speeds and directions. Generated through NOAA's Air Resources Laboratory HYSPLIT

Figure 2-13 illustrates the elevated levels of PM_{10} concentrations measured in Riverside, Imperial and Yuma Counties. The entrained dust particles resulted in a (midnight to midnight) 24-hr average concentration of 190.9 µg/m^3 at the Brawley monitor. Best Available Control Measures (BACM) was overwhelmed by the suddenness and intensity of the meteorological event. The elevated winds and PM_{10} concentrations measured in Riverside, Imperial, and Yuma counties illustrate the regional nature of the event (**Tables 2-1 and 2-2**). This chain of meteorological events resulted in steep increases in PM_{10} concentrations in Imperial County, heavily affecting the Brawley monitoring site.

FIGURE 2-13
72 HOUR PM_{10} CONCENTRATIONS REGIONAL SITES

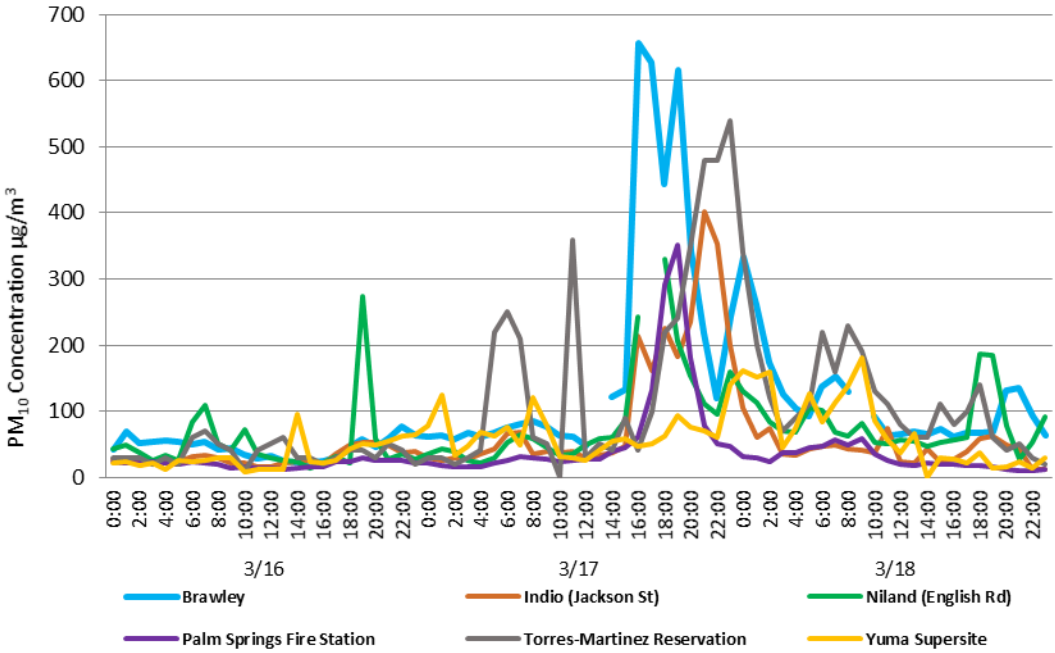


Fig 2-13: The 72-hour relative PM_{10} concentrations at various monitoring locations throughout Riverside, Imperial, and Yuma counties. The graph clearly demonstrates the elevation of PM_{10} concentration on March 17, 2014, at all sites that were impacted by the weather system and accompanying winds

III Historical Norm

III.1 Analysis

While naturally occurring high wind events may occur seasonally and at times frequently and qualify for exclusion under the EER, historical fluctuations of the particulate concentrations provide insight into the frequency of events within an identified area. The following time series plots illustrate that PM_{10} concentrations measured at the Brawley monitor on March 17, 2014, were unusual and in excess of normal historical fluctuations. The analysis also provides convincing evidence that the event affected air quality.

Figure 3-1 shows the time series of available FRM and BAM 24-hr PM_{10} concentrations at the Brawley monitor for the five-year period of January 1, 2010 through March 17, 2014, for a total of 1,537 sample run days. Note that prior to 2013, the BAM data was not considered FEM and was not submitted to AQS. However, this does not affect percentile rankings. In order to properly establish the intensity of the event, as it occurred on March 17, 2014, 24-hour averaged PM_{10} concentrations were compiled and plotted as a time series, January 1, 2010 to March 17, 2014 to provide a historical perspective of PM_{10} concentrations.

FIGURE 3-1
BRAWLEY HISTORICAL
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MARCH 17, 2014

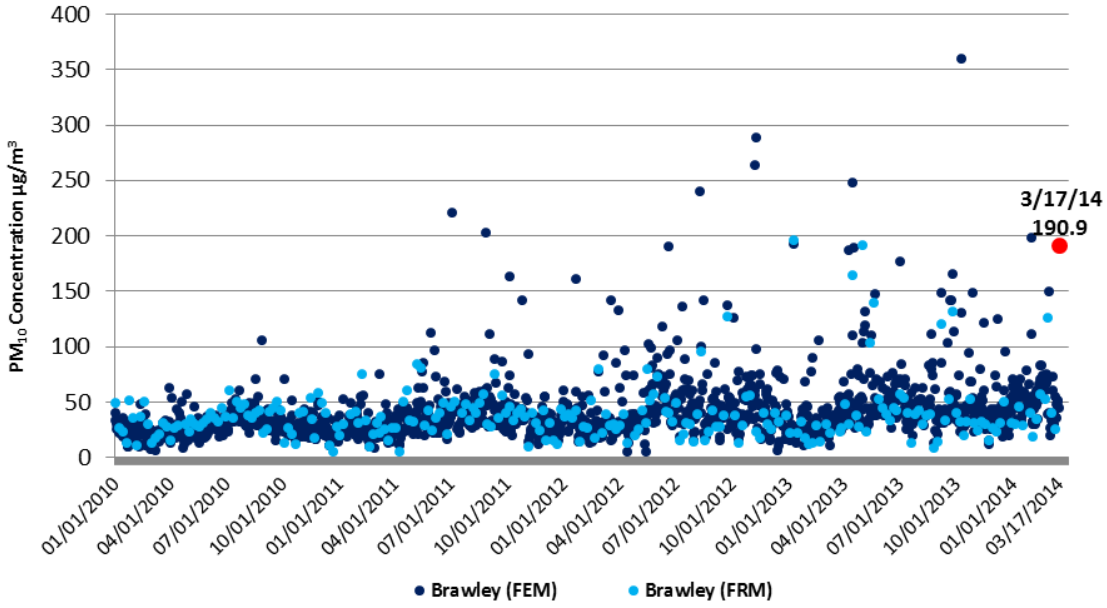


Fig 3-1: A historical comparison of PM_{10} concentrations demonstrates that the March 17, 2014, measured concentration of 190.9 µg/m^3 by the Brawley BAM 1020 PM_{10} monitor was outside normal historical measurements**.** Concentrations above 150 µg/m^3 indicate other historical exceedances. Air quality data from the EPA's AQS data bank

Figure 3-1 includes a total of 1,785 credible samples, measured by either FRM or FEM monitors between January 1, 2010 and March 17, 2014. During that period there were a total of 18 exceedances that occurred. Of those 18 exceedances, only three days experienced FRM exceedances. Two were a combination of FEM/FRM and one was a single FRM exceedance. Of the 18 measured exceedances, only four were recorded during the first quarter (January through March). That translates as just 0.22 percent of all samples. **Figure 3-2** provides a seasonal first-quarter historical comparison for months January through March only. The four exceedances measured translates into 0.78 percent of all 516 credible FRM and FEM samples during this period.

FIGURE 3-2
BRAWLEY SEASONAL COMPARISON
PM_{10} 24 HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MARCH 17, 2014

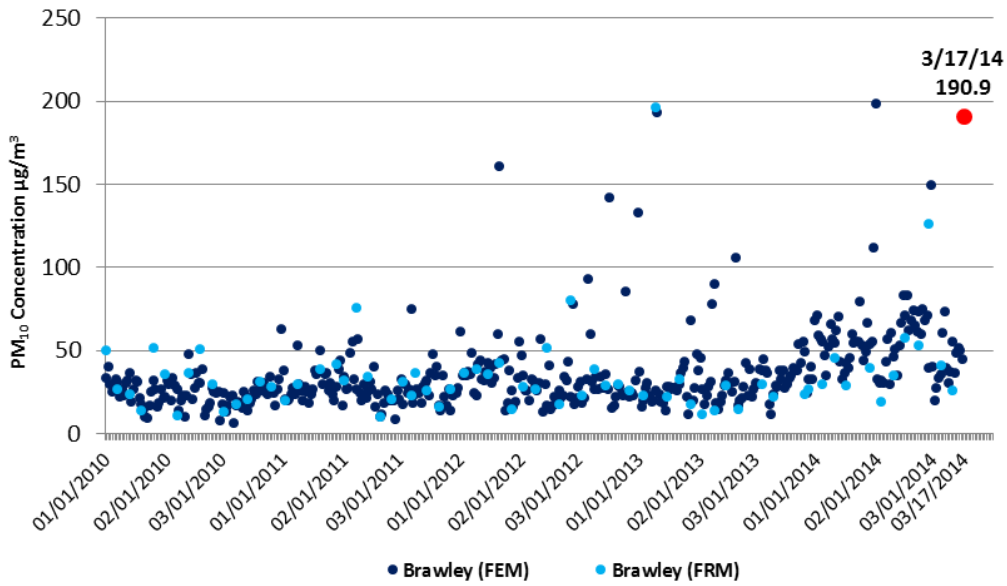


Fig 3-2: The seasonal historical comparison using the months of January through March for the years 2010 through 2014 (ending March 17, 2014), supports that the measured exceedance at the Brawley monitor on March 17, 2014, was outside the historical norm. Concentrations above 150 µg/m^3 indicate other historical exceedances. Air quality data from the EPA's AQS data bank

The combined FRM and FEM annual dataset (2010 through first quarter 2014) shows that the FEM concentration of 190.9 µg/m^3 for Brawley is above the 99th percentile ranking (**Figure 3-3**). The combined FRM and FEM seasonal dataset (months January through March, years 2010 to 2014) shows that the FEM concentration of 190.9 µg/m^3 for Brawley falls just inside the 99th percentile ranking (**Figure 3-4**). Looking at the annual time series concentrations, the seasonal time series concentrations, and the percentile rankings, the March 17, 2014 measured exceedance of 190.9 µg/m^3 is clearly in excess of normal historical fluctuations, with seasonal exceedances of the NAAQS not occurring frequently.

FIGURE 3-3
BRAWLEY HISTORICAL
PM_{10} 24 HR FRM & FEM CONCENTRATIONS
JANUARY 1, 2010 TO MARCH 17, 2014

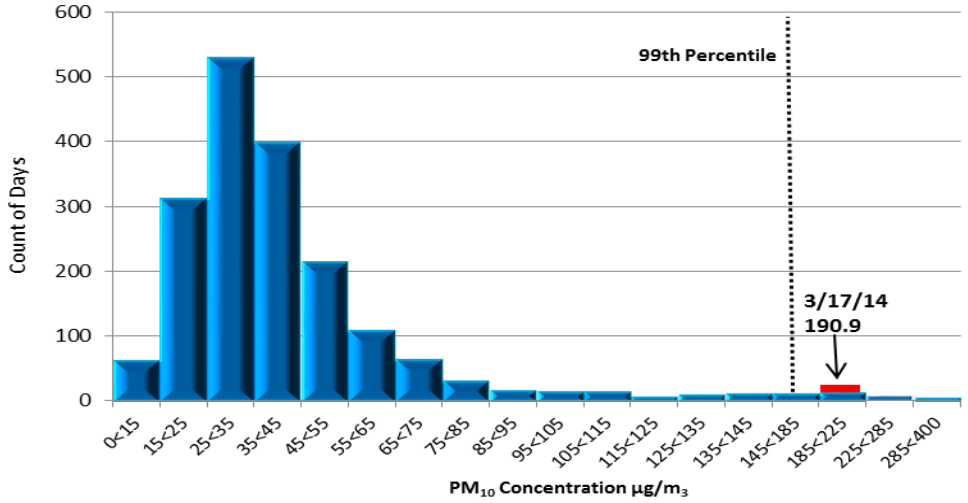


Fig 3-3: The 24 hr average PM_{10} concentrations measured at Brawley monitoring site demonstrates that the March 17, 2014 event was in excess of the 99th percentile

FIGURE 3-4
BRAWLEY SEASONAL
PM_{10} 24 HR FRM & FEM CONCENTRATIONS
JANUARY 1, 2010 TO MARCH 17, 2014

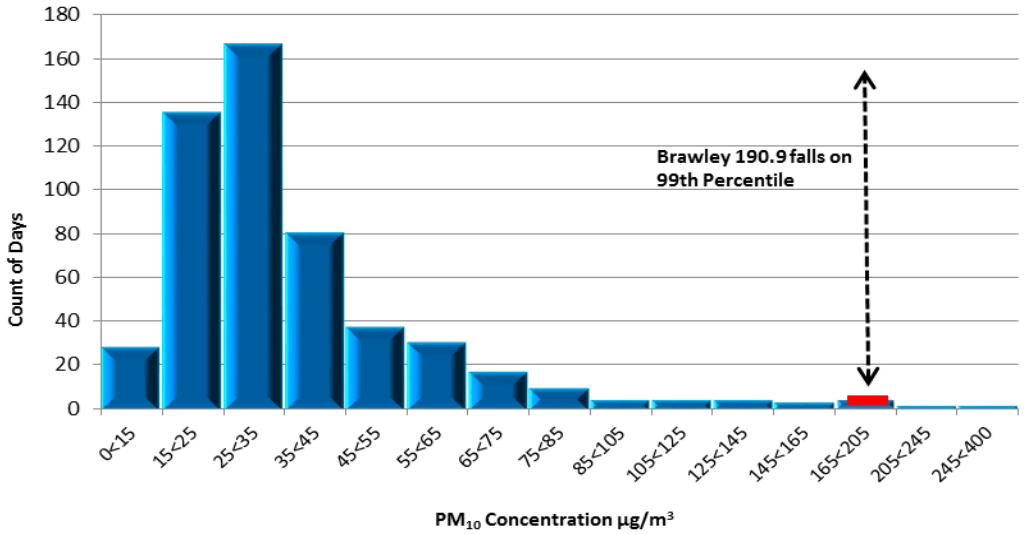


Fig 3-4: The 24 hr average PM_{10} concentration at the Brawley monitoring site demonstrates that the March 17, 2014 event fell on the 99th percentile

III.2 Summary

The information provided by the time series plots, seasonal time series plots, and the percentile rankings, illustrate that the PM_{10} concentration observed on March 17, 2014 occurs infrequently. When comparing the measured PM_{10} levels on March 17, 2014, and following USEPA EER guidance, this demonstration provides supporting evidence that the measured exceedance at the Brawley monitoring site was outside the normal historical fluctuations. This historical concentration data, and the demonstration found under the clear causal relationship, supports that the measured exceedance on March 17, 2014, was an exceptional event and that it affected air quality.

IV Not Reasonably Controllable or Preventable

IV.1 Background

Inhalable particulate matter (PM_{10}) contributes to effects that are harmful to human health and the environment, including premature mortality, aggravation of respiratory and cardiovascular disease, decreased lung function, visibility impairment, and damage to vegetation and ecosystems. Upon enactment of the 1990 Clean Air Act (CAA) amendments, Imperial County was classified as moderate nonattainment for the PM_{10} NAAQS under CAA sections 107(d)(4)(B) and 188(a). By November 15, 1991, such areas were required to develop and submit State Implementation Plan (SIP) revisions providing for, among other things, implementation of reasonably available control measures (RACM).

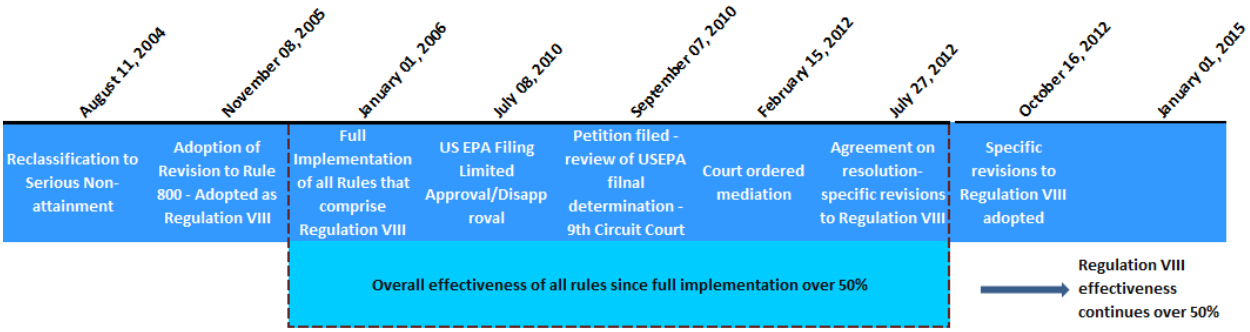
Partly to address the RACM requirement, ICAPCD adopted local Regulation VIII rules to control PM_{10} from sources of fugitive dust on October 10, 1994, and revised them on November 25, 1996. USEPA did not act on these versions of the rules with respect to the federally enforceable SIP.

On August 11, 2004, USEPA reclassified Imperial County as a serious nonattainment area for PM_{10}. As a result, CAA section 189(b)(1)(B) required all BACM to be implemented in the area within four years of the effective date of the reclassification, i.e., by September 10, 2008.

On November 8, 2005, partly to address the BACM requirement, ICAPCD revised the Regulation VIII rules to strengthen fugitive dust requirements. On July 8, 2010, USEPA finalized a limited approval of the 2005 version of Regulation VIII, finding that the seven Regulation VIII rules largely fulfilled the relevant CAA requirements. Simultaneously, USEPA also finalized a limited disapproval of several of the rules, identifying specific deficiencies that needed to be addressed to fully demonstrate compliance with CAA requirements regarding BACM and enforceability.

In September 2010, ICAPCD and the California Department of Parks and Recreation (DPR) filed petitions with the Ninth Circuit Federal Court of Appeals for review of USEPA's limited disapproval of the rules. After hearing oral argument on February 15, 2012, the Ninth Circuit directed the parties to consider mediation before rendering a decision on the litigation. On July 27, 2012, ICAPCD, DPR and USEPA reached agreement on a resolution to the dispute, which included a set of specific revisions to Regulation VIII. These revisions are reflected in the version of Regulation VIII adopted by ICAPCD on October 16, 2012 and approved by USEPA April 22, 2013. Since 2006 ICAPCD had implemented regulatory measures to control emissions from fugitive dust sources and open burning in Imperial County.

FIGURE 4-1



REGULATION VIII GRAPHIC TIMELINE DEVELOPMENT

Fig. 4-1: Regulation VIII Graphic Timeline

IV.1.a Control Measures

A brief summary of Regulation VIII which is comprised of seven fugitive dust rules is found below. The complete set of rules can be found in **Appendix D**.

ICAPCD's Regulation VIII consists of seven interrelated rules designed to limit emissions of PM_{10} from anthropogenic fugitive dust sources in Imperial County.

Rule 800, General Requirements for Control of Fine Particulate Matter, provides definitions, a compliance schedule, exemptions and other requirements generally applicable to all seven rules. It requires the United States Bureau of Land Management (BLM), United States Border Patrol (BP) and DPR to submit dust control plans (DCP) to mitigate fugitive dust from areas and/or activities under their control. Appendices A and B of Appendix D in this document describe methods for determining compliance with opacity and surface stabilization requirements in Rules 801 through 806.

Rule 801, Construction and Earthmoving Activities, establishes a 20% opacity limit and control requirements for construction and earthmoving activities. Affected sources must submit a DCP and comply with other portions of Regulation VIII regarding bulk materials, carry-out and track-out, and paved and unpaved roads. The rule exempts single family homes and waives the 20% opacity limit in winds over 25 mph under certain conditions.

Rule 802, Bulk Materials, establishes a 20% opacity limit and other requirements to control dust from bulk material handling, storage, transport and hauling.

Rule 803, Carry-Out and Track-Out, establishes requirements to prevent and clean-up mud and dirt transported onto paved roads from unpaved roads and areas.

Rule 804, Open Areas, establishes a 20% opacity limit and requires land owners to prevent vehicular trespass and stabilize disturbed soil on open areas larger than 0.5 acres in urban areas, and larger than three acres in rural areas. Agricultural operations are exempted.

Rule 805, Paved and Unpaved Roads, establishes a 20% opacity limit and control requirements for unpaved haul and access roads, canal roads and traffic areas that meet certain size or traffic thresholds. It also prohibits construction of new unpaved roads in certain circumstances. Single-family residences and agricultural operations are exempted.

Rule 806, Conservation Management Practices, requires agricultural operation sites greater than 40 acres to implement at least one conservation management practice (CMP) for each of several activities that often generate dust at agricultural operations. In addition, agricultural operation sites must prepare a CMP plan describing how they comply with Rule 806, and must make the CMP plan available to the ICAPCD upon request.

IV.1.b Additional Measures

Imperial County Natural Events Action Plan (NEAP)

On August 2005, the ICAPCD adopted a NEAP for the Imperial County, as was required under the former USEPA Natural Events Policy, to address PM_{10} events by:

- Protecting public health;
- Educating the public about high wind events;
- Mitigating health impacts on the community during future events; and
- Identifying and implementing BACM measures for anthropogenic sources of windblown dust.

Smoke Management Plan (SMP) Summary

There are 35 Air Pollution Control Districts or Air Quality Management Districts in California which are required to implement a district-wide smoke management program. The regulatory basis for California's Smoke Management Program, codified under Title 17 of the California Code of Regulations is the "Smoke Management Guidelines for Agricultural and Prescribed Burning" (Guidelines). California's 1987 Guidelines were revised to improve interagency coordination, avoid smoke episodes, and provide continued public safety while providing adequate opportunity for necessary open burning. The revisions to the 1987 Guidelines were approved March 14, 2001. All air districts, with the exception of the San Joaquin Valley Air Pollution Control District (SJAPCD) were required to update their existing rules and Smoke Management Plans to conform to the most recent update to the Guidelines.

Section 80150 of Title 17 specifies the special requirements for open burning in agricultural operations, the growing of crops and the raising of fowl or animals. This section specifically

requires the ICAPCD to have rules and regulations that require permits that contain requirements that minimize smoke impacts from agricultural burning.

On a daily basis, the ICAPCD reviews surface meteorological reports from various airport agencies, the NWS, State fire agencies and CARB to help determine whether the day is a burn day. Using a four quadrant map of Imperial County allowed burns are allocated in such a manner as to assure minimal to no smoke impacts safeguarding the public health. Finally, all permit holders are required to notice and advise members of the public of a potential burn. This noticing requirement is known as the Good Neighbor Policy. On March 17, 2014 the ICAPCD declared a no burn day **(Appendix A).** No complaints were filed for agricultural burning on March 17, 2014.

IV.1.c Review of Source-Permitted Inspections and Public Complaints

A query of the ICAPCD permit database was compiled and reviewed for active permitted sources throughout Imperial County and specifically around Brawley during the time of the March 17, 2014 PM_{10} exceedance. An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM_{10} emissions. March 17, 2014 was officially designated as a No Burn day. No complaints were filed on March 17, 2014 related to agricultural or waste burning or fugitive dust.

IV.2 Forecasts and Warnings

The ICAPCD and the National Weather Service (NWS) provided notification that afternoon winds 15 to 25 mph and gust to 35 miles per hour (mph) could impact this region (see **Appendix A**). In addition, an Air Quality Index alert was issued by ICAPCD on March 17, 2014, due to elevated levels of PM_{10}. The web-based AQI alert by the ICAPCD notified the public that air quality in Brawley had reached the "orange" AQI value of 101-150, or the "Unhealthy for Sensitive Groups" level. The notice stated: "Although general public is not likely to be affected at this AQI range, people with lung disease, older adults and children are at a greater risk from exposure to ozone, whereas persons with heart and lung disease, older adults and children are at greater risk from the presence of particles in the air." See **Section V** for AQI notice.

IV.3 Wind Observations

Wind data during the event were available from airports in eastern Riverside County, southern San Diego County, southwestern Yuma County (Arizona), northern Mexico, and Imperial County. Both Imperial County Airport (KIPL) and the El Centro NAF (KNJK) recorded wind gusts over 30 mph. El Centro NAF also measured wind speeds of up to 26 mph. See **Table 2-2**. Wind speeds of over 25 mph are normally sufficient to overcome most PM_{10} control measures. During the March 17, 2014 event, wind speeds were above the 25 mph threshold overcoming the BACM in place.

IV.4 Summary

The weather and air quality forecasts and warnings outlined in this section demonstrate that strong winds associated with a large low-pressure system caused uncontrollable PM_{10} emissions. The BACM list as part of the control measures in Imperial County for fugitive dust emissions were in place at the time of the event. These control measures are required for areas designated as "serious" non-attainment for PM_{10}, such as Imperial County. Thus, the BACM in place at the time of the event were beyond reasonable. In addition, surface wind measurements during the event near Brawley and surrounding areas upstream to the Brawley FEM monitor, were high enough (at or above 25 mph, with wind gusts up to 33 mph) that BACM PM_{10} control measures would have been overwhelmed.

Finally, a high wind dust event can be considered as a natural event, even when portions of the wind-driven emissions are anthropogenic, as long as those emissions have a clear causal relationship to the event and were determined to be not reasonably controllable or preventable. This demonstration has shown that the event that occurred on March 17, 2014 was not reasonably controllable or preventable despite the strong and in force BACM within the affected areas in Imperial County. This demonstration has similarly established a clear causal relationship between the exceedance and the high wind event timeline and geographic location. The March 17, 2014 event can be considered an exceptional event under the requirements of the exceptional event rule.

V Clear Causal Relationship

V.1 Discussion

Meteorological observations for March 17, 2014 identified a large low pressure system affecting a large portion of southeastern California that brought strong and gusty westerly winds across the mountains and deserts into Imperial County. The meteorological event brought high winds exceeding 30 mph to portions of the Imperial Valley. **Figure 5-1** shows how the low pressure system moved into the region, causing a modest packing of pressure gradients that led to the gusty winds over the region.

FIGURE 5-1
GOES WEST-EAST INFRARED SATELLITE IMAGES

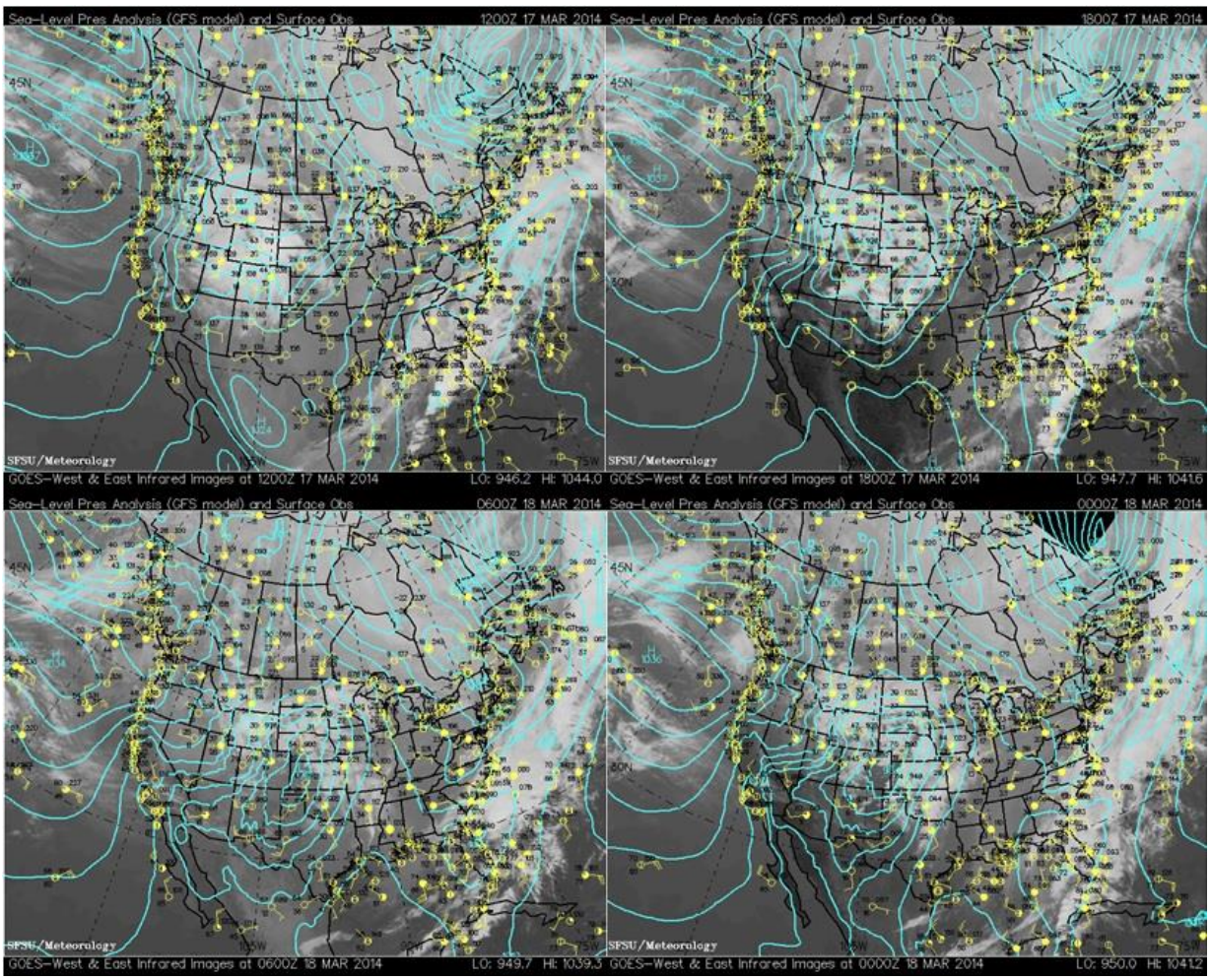


Fig 5-1: Four images show the progression of the low pressure system. Clockwise, from upper left: 04:00 LST; 10:00 LST; 16:00 LST; and 22:00 LST. The gradient is tightest during the 16:00 image, which corresponds to high winds measured at several meteorological sites, and is the hour of maximum PM_{10} concentration. Image: http://virga.sfsu.edu/archive/composites/sathts_snd/1403/

Entrained windblown dust from natural areas, particularly from the desert area and anthropogenic sources controlled with BACM, is verified by the meteorological and air quality observations on March 17, 2014. The regional effect of the weather system is reflected in the moderately elevated PM_{10} concentrations were observed at several monitoring sites in eastern Riverside County, and southwestern Yuma County in Arizona (see **Figure 2-13**). Strong winds over mostly barren desert areas generally to the west of Brawley were responsible for the PM_{10} exceedance recorded by the Brawley FEM monitor on March 17, 2014. Powerful gusts at upstream locations like the Fish creek Mountains and Ocotillo Wells were instrumental in lofting and transporting dust to Brawley. These sites started experiencing gusts several hours before Brawley recorded a significant spike in its hourly PM_{10} concentration at 16:00. Powerful gusts continued, keeping Brawley's PM10 concentrations elevated for several hours. **Figure 5-2** identifies the source area.

FIGURE 5-2
KEY UPSTREAM WIND SPEEDS - MARCH 17, 2014 EVENT

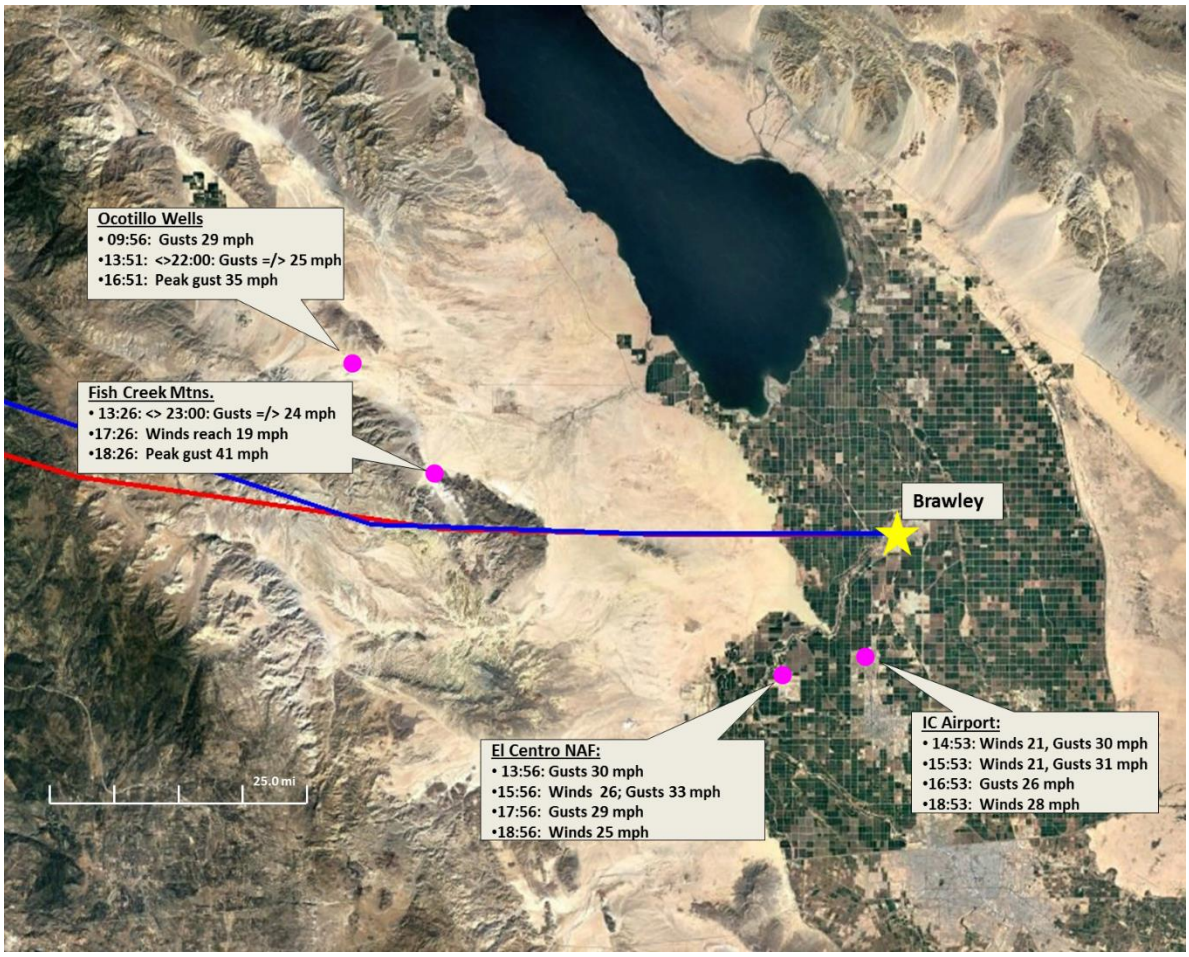


Fig 5-2: Gusty predominantly westerly winds lofted dust as winds passed over arid, mostly barren soils to the west of Brawley. The HYSPLIT 6-hour back trajectory (see also **Figure 2-12**) shows the general path of airflow as it approached Brawley. Red line is airflow at 10 meters above ground level, blue is at 100 meters

Gusty westerly winds, but also with a west-southwest and west-northwest influence, entrained particulate matter in upstream areas west of Brawley. The wind direction as illustrated by the windrows for sites west of the Brawley monitor provide some information as to the effect on airflow by topography. The Fish Creek Mountains shows strong W-to-WSW winds, as does the El Centro NAF. Ocotillo Wells shows W to WNW to NW winds. Both the Naval Test Base and Imperial County Airport show strongest winds from the west. This placed Brawley in the path of this arc. **Figure 5-3** shows a collection of wind roses at upstream sites. See **Appendix B** for larger reproductions.

FIGURE 5-3
KEY WIND DIRECTIONS - MARCH 17, 2014

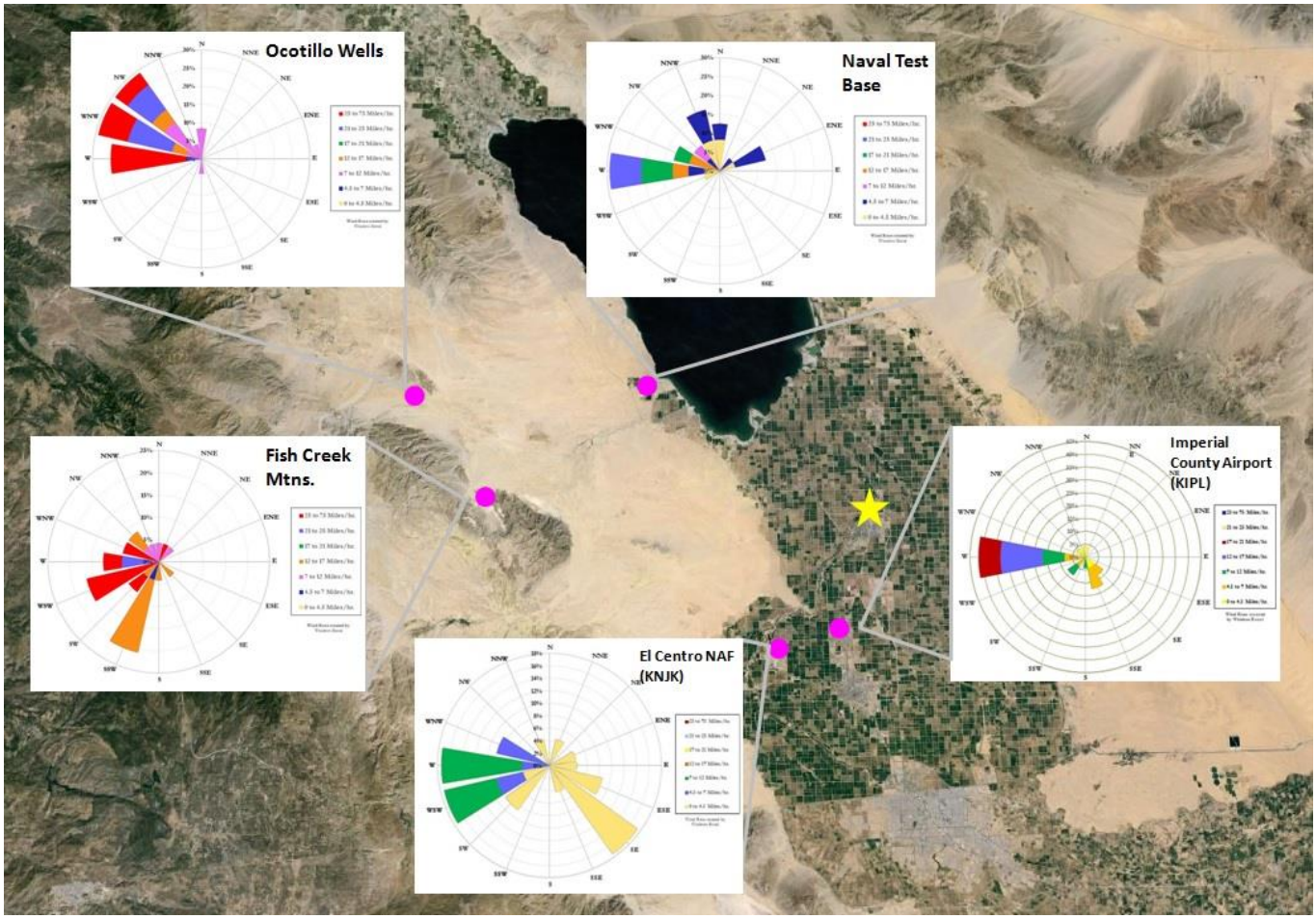


Fig 5-3: Ocotillo Wells and Fish Creek Mountains wind roses utilize wind gust speeds. The Naval test Base, El Centro NAF, and Imperial County Airport use wind speeds. Wind data from the NCEI's QCLCD data bank and the University of Utah's MesoWest data bank

Brawley measured PM_{10} values above 400 µg/m^3 between 16:00 and 19:00. Increased levels of particulate matter were measured for several hours at Niland, but not to the degree at Brawley. As winds declined around 20:00, PM_{10} concentrations likewise declined.

On March 17, 2014, at 03:08 PDT, the NWS issued a forecast predicting wind speeds of 15 to 25 mph, with gusts up to 35 mph for the affected areas as Imperial County California (**Appendix A**). **Figure 5-4** is an illustration of the wind speeds[3] throughout Imperial County beginning with March 16, 2014 and ending March 18, 2014. The consistency for all stations is evident. For March 17, 2014, all stations recorded elevated wind speeds as early as 13:00. As the system continues moving into this region, elevated wind speeds are evident throughout the afternoon and evening hours on March 17, 2014. Winds started to diminish during the early morning hours on Mach 18, 2014.

FIGURE 5-4
72 HOUR WIND SPEEDS REGIONAL SITES

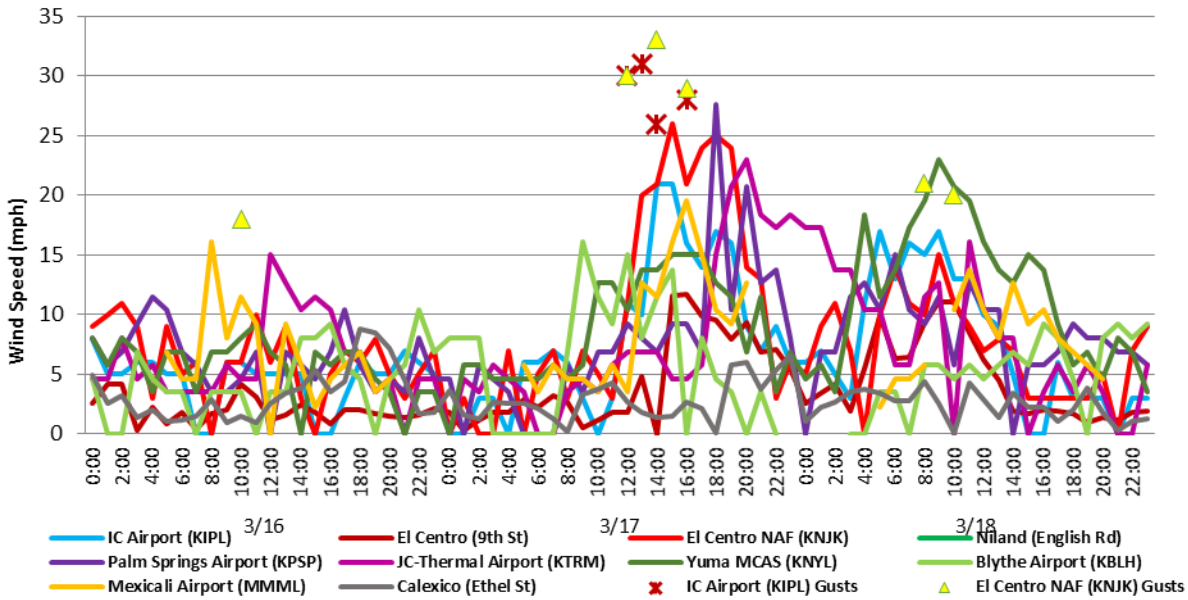


Fig 5-4: Meteorological data collected from twelve sites within the Imperial, Riverside and Yuma Counties over a 3-day period from March 16, 2014 to March 18, 2014 shows a uniform spike in wind speed during the March 17, 2014 exceptional event. Wind data from the NCEI's QCLCD data bank and the EPA's AQS data bank

Figures 5-5 demonstrates the spatial and temporal relationship between the high winds and the transported entrained dust affecting the Brawley monitor on March 17, 2014. The correlation of hourly BAM 1020 data from the Brawley air monitoring station and the elevated wind speeds on March 17, 2014 indicates that an increase in wind speeds was followed by a rise in PM_{10} concentrations. The peak hourly PM_{10} concentrations occurred throughout the afternoon and early evening hours, which are associated with the high peak winds and gusts measured at the different stations in Imperial County. **Appendix C** contains additional graphs illustrating the

[3] National Weather Service; NOAA's Glossary – Wind Speed: The rate at which air is moving horizontally past a given point. It may be a 2-minute average speed (reported as wind speed) or an instantaneous speed (reported as a peak wind speed, wind gust, or squall)[http://w1.weather.gov/glossary/index.php?letter=w]

relationship between the high PM_{10} concentrations and increased wind speeds from other monitoring sites within Imperial and Riverside counties on March 17, 2014.

FIGURE 5-5
BRAWLEY PM_{10} CONCENTRATIONS & WIND SPEED CORRELATION

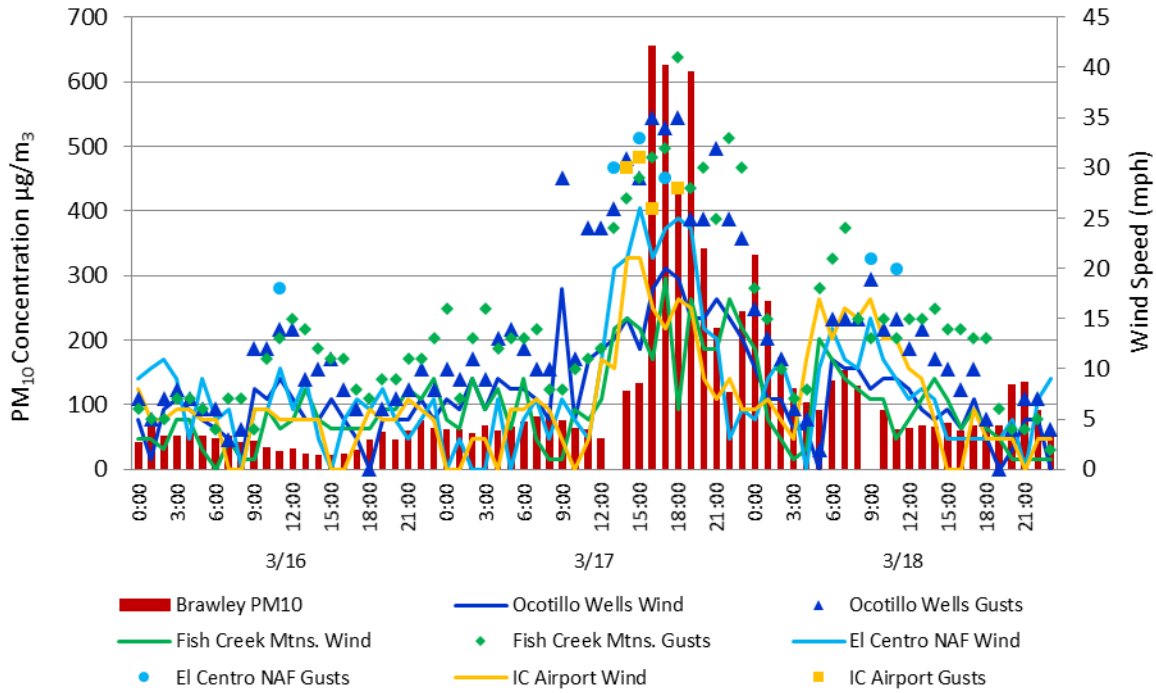


Fig 5-5: Brawley PM_{10} concentrations rose in response to increased wind speeds recorded at upstream wind sites. Wind data from the NCEI's QCLCD data bank and the University of Utah's MesoWest data bank

Figure 5-6 compares observed visibility from El Centro NAF and hourly PM_{10} concentrations at Brawley and other regional air quality sites. For two hours, El Centro reported minimum visibility of six miles along with haze (see QCLCD document in Appendix B). Shortly after, as the haze was carried by winds, Brawley began recording elevated PM_{10} concentrations. The elevated PM_{10} concentrations at other sites supports that the regional wind event affected monitors located far away from Brawley.

FIGURE 5-6
72 HOUR PM_{10} CONCENTRATIONS & LOCAL VISIBILITY

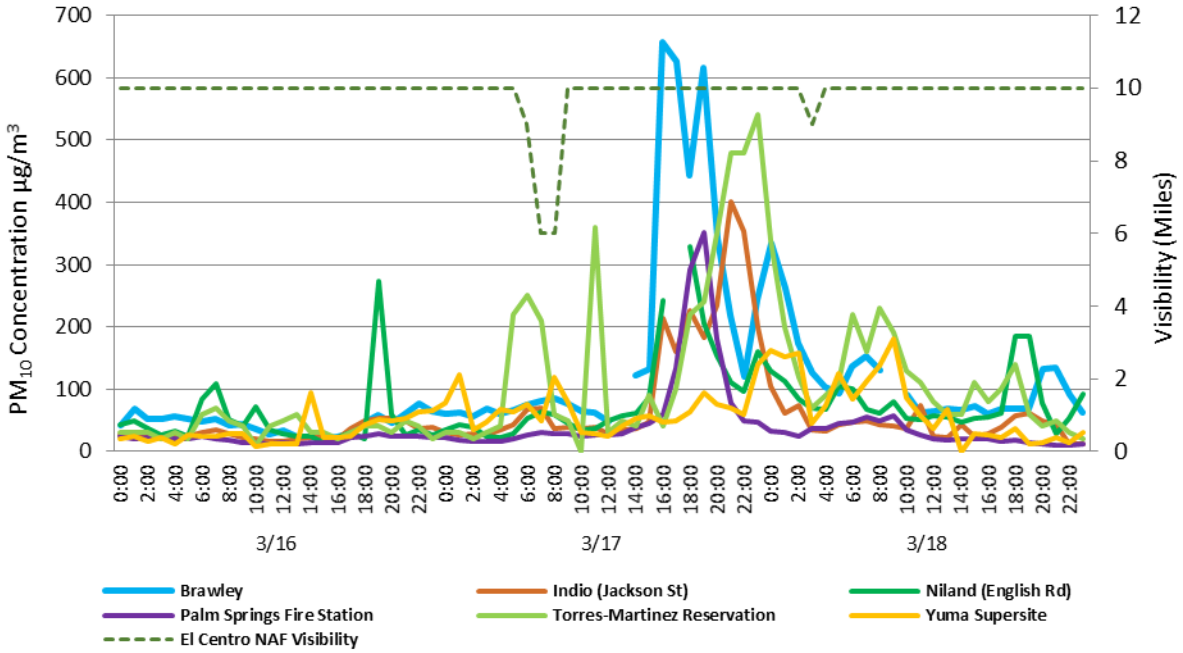


Fig 5-6: Comparison of observed visibility reported at El Centro NAF and hourly PM_{10} concentrations at regional sites

Figure 5-7 is the resultant Air Quality Index (AQI) for March 17, 2014.[4] The Air Quality Index increased to the "Moderate" or Yellow category from 3 p.m. to 9 p.m. From 9 p.m. to 12 p.m., the AQI remained at the "Unhealthy for Sensitive Groups or "Orange" range, confirming that fugitive dust transported by high winds had impacted the quality of air in Imperial County.

[4] The AQI is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. Ground-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country. Source: https://airnow.gov/index.cfm?action=aqibasics.aqi

FIGURE 5-7
IMPERIAL VALLEY AIR QUALITY INDEX FOR BRAWLEY, MARCH 17, 2014

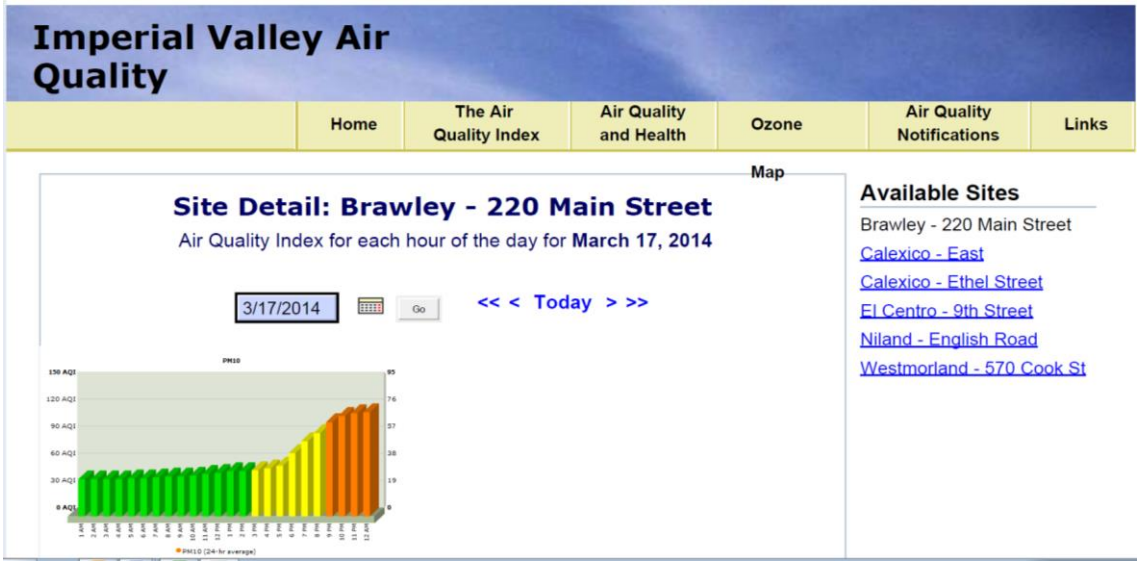


Fig 5-9: Demonstrates that air quality in Imperial County was affected by suspended dust entrained and transported by high winds when a large low pressure system passed through the area on March 17, 2014

V.2 Summary

The preceding discussion, graphs, and figures provide wind speed and concentration data illustrating the spatial and temporal representation of the high winds accompanying the low-pressure system that passed through southeastern California. The information provides a clear causal relationship between the entrained windblown dust and the PM_{10} exceedance measured at the Brawley monitor on March 17, 2014. Furthermore, weather forecasts and an issued air quality alert illustrate the effect upon air quality within the region extending from all of Imperial County to the southern portion of Riverside County. Large amounts of coarse particles (dust) and PM_{10} were carried aloft by strong westerly winds into the lower atmosphere. The area of origin is the desert areas of the Sonoran Desert located on the western edge of Imperial County. Combined, the information demonstrates that the elevated PM_{10} concentration measured on March 17, 2014, coincided with high wind speeds, and that strong winds were experienced over the southern portion of Riverside County and all of Imperial County.

VI Conclusions

The PM_{10} exceedance that occurred on March 17, 2014, satisfies the criteria of the EER which states that in order to justify the exclusion of air quality monitoring data evidence must be provided for the following elements:

TABLE 6-1[5] Technical Elements Checklist Exceptional Event Demonstration for High Wind Dust Event (PM_{10})		Document Section
1	whether the event was **not reasonably controllable or preventable** (nRCP)	22-26
2	whether there was **a clear causal** relationship (CCR) "There is a clear causal relationship between the measurement under consideration and the event…	27-33
3	whether the event **affects air quality** (AAQ) ...the event that is claimed to have affected the air quality in the area";	37
4	whether the event was caused by human activity unlikely to recur or was a natural event (HAURL / **Natural Event**) "The event satisfies the criteria set forth in 40 CFR §50.1(j)" for the definition of an exceptional event (see above);	27-36

VI.1 Affects Air Quality

The preamble to the EER states that an event is considered to have affected air quality if it can be demonstrated that there is a clear causal relationship between the monitored exceedance and the event, and that the event is associated with a measured concentration in excess of normal historical fluctuations. Given the information presented in this demonstration, particularly section V, we can reasonably conclude that the event in question affected air quality.

VI.2 Not Reasonably Controllable or Preventable

In order for an event to be defined as an exceptional event under section 50.1(j) of 40 CFR Part 50 an event must be "not reasonably controllable or preventable." This requirement is met by demonstrating that, despite BACM in place in Imperial County, high winds overwhelmed all BACM controls. The PM_{10} exceedances measured at the Brawley monitor and discussed within this report was caused by naturally occurring strong gusty winds that transported fugitive dust into Imperial County from areas located within the Sonora Desert regions to the west of Imperial County. These facts provide strong evidence that the PM_{10} exceedance on March 17, 2014, was not reasonably controllable or preventable.

[5] 40 CFR §50.1

VI.3 Natural Event

As discussed within this demonstration, the PM_{10} exceedance which occurred in Brawley on March 17, 2014, was caused by transport of fugitive dust into Imperial County by strong predominantly west winds associated with a large low pressure system. The event therefore qualifies as a natural event.

VI.4 Clear Causal Relationship

The time series plots of PM_{10} concentrations at different areas in Imperial and Riverside County monitors demonstrates a consistency of elevated gusty winds and concentrations of PM_{10} at the Brawley monitor on March 17, 2014 (section V). In addition, these time series plots and graphs demonstrate that the high PM_{10} concentrations and the gusty winds were an event that was widespread, regional and uncontrollable. Arid conditions preceding the event resulted in soils that were particularly susceptible to particulate suspension by the elevated gusty winds. Finally, days immediately before and after the high wind event had PM_{10} concentrations well below the NAAQS.

VI.5 Historical Norm

The historical annual and seasonal 24-hr average PM_{10} values measured at the Brawley monitor were historically unusual compared to a multi-year data set (Section III).

Appendix A: Public Notification that a potential event was occurring (40 CFR §50.14(c)(1)(i))

This section contains wind advisories issued by NOAA and Imperial County on March 17, 2014. In addition, this Appendix contains the air quality alert issued by Imperial County advising sensitive receptors of potentially unhealthy conditions in Imperial County resulting from the strong gusty winds.

Appendix B: Meteorological Data.

This appendix contains the time series plots, graphs, wind rose, etc for selected monitors in Imperial and Riverside Counties. These plots, graphs and tables demonstrate the regional impact of the wind event.

Appendix C: Correlated PM_{10} Concentrations and Winds.

This appendix contains the graphs depicting the correlations between PM_{10} Concentrations and elevated wind speeds for selected monitors in Imperial and Riverside Counties. These graphs show an increase in PM_{10} concentrations in Imperial County coincident with the arrival of high wind speeds and wind gusts.

Appendix D: Regulation VIII – Fugitive Dust Rule.

This appendix contains the compilation of the BACM adopted by the Imperial County Air Pollution Control District and approved by the United States Environmental Protection Agency. A total of seven rules numbered 800 through 806 comprise the set of Regulation VIII Fugitive Dust Rules.