IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

(Hikespeak) Anza-Borrego; Calcite Mine Trail- https://www.hikespeak.com/img/Anza-Borrego/CalciteMine/Calcite_Mine_Trail_IMG_8731.jpg

March 30, 2017
Exceptional Event Documentation
For the Imperial County PM_{10} Nonattainment Area

An exceedance of the National Ambient Air Quality Standard (NAAQS) for PM_{10} at the Brawley, Calexico, El Centro, Niland, and Westmorland monitors in Imperial County, California on March 30, 2017

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ACRONYM	DESCRIPTIONS
AOD	Aerosol Optical Depth
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)
HC	Historical Concentrations
HYSPLIT	Hybrid Single Particle Lagrangian Integrated Trajectory Model
ICAPCD	Imperial County Air Pollution Control District
INPEE	Initial Notification of a Potential Exceptional Event
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)
PST	Local Standard Time
MMML/MXL	Mexicali, Mexico Airport
MODIS	Moderate Resolution Imaging Spectroradiometer
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
SMP	Smoke Management Plan
SSI	Size-Selective Inlet
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UTC	Coordinated Universal Time
WRCC	Western Regional Climate Center

I Introduction

In 2007, the United States Environmental Protection Agency (US EPA) adopted the "Treatment of Data Influenced by Exceptional Events Rule" (EER)[1] to govern the review and handling of certain air quality monitoring data for which the normal planning and regulatory processes are not appropriate. Under the terms of the EER, the US EPA may exclude monitored exceedances of the National Ambient Air Quality Standard (NAAQS) if a State adequately demonstrates that an exceptional event caused the exceedance.

The 2016 revision to the EER added sections 40 CFR §50.1(j)-(r) [Definitions], 50.14(a)-(c) and 51.930(a)-(b) to 40 Code of Federal Regulations (CFR). These sections contain definitions, criteria for US EPA concurrence, procedural requirements and requirements for State demonstrations. The demonstration must satisfy all of the rule criteria for US EPA to concur with the requested exclusion of air quality data from regulatory decisions.

Title 40 CFR §50.14(c)(3)(iv) outlines the elements that a demonstration must include for air quality data to be excluded:

TABLE 1-1 TITLE 40 CFR §50.14(c)(3)(iv) CHECKLIST EXCEPTIONAL EVENT DEMONSTRATION FOR HIGH WIND DUST EVENT (PM_{10})		DOCUMENT SECTION
1	A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s)	Pg. 9
2	A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation	Pg. 18
3	Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times to support the requirement at paragraph (c)(3)(iv)(B) of this section	Pg. 32
4	A demonstration that the event was both not reasonably controllable and not reasonably preventable	Pg. 43
5	A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event	Pg. 48

[1] "Treatment of Data Influenced by Exceptional Events; Final Guidance", 81 FR 68216, October 2, 2016

Aside from the above, a State must demonstrate that it has met several procedural requirements during the demonstration process, including:

TABLE 1-2 PROCEDURAL CHECKLIST EXCEPTIONAL EVENT DEMONSTRATION FOR HIGH WIND DUST EVENT (PM_{10})		DOCUMENT SECTION
1	**Public Notification [40 CFR §50.14(c)(1)]** – In accordance with mitigation requirement at 40 CFR 51.930(a)(1), notification to the public promptly whenever an event occurs or is reasonably anticipated to occur which may result in the exceedance of an applicable air quality standard	Pg. 3 and Appendix C
2	**Initial Notification of Potential Exceptional Event [40 CFR §50.14(c)(2)]** - Submission to the Administrator of an Initial Notification of Potential Exceptional Event and flagging of the affected data in US EPA's Air Quality System (AQS) as described in 40 CFR §50.14(c)(2)(i),	Pg. 3
3	**Public Comment Process [40 CFR §50.14(c)(3)(v)]** - Documentation of fulfillment of the public comment process described in 40 CFR §50.14(c)(3)(v), and	Pg. 4 and Appendix C
4	**Mitigation of Exceptional Events [40 CFR §51.930]** - Implementation of any applicable mitigation requirements (Mitigation Plan) as described in 40 CFR §51.930	Pg. 4

The Imperial County Air Pollution Control District (ICAPCD) has been submitting criteria pollutant data since 1986 into the US EPA's Air Quality System (AQS). In Imperial County, prior to 2017, Particulate Matter Less Than 10 Microns (PM_{10}) was measured by either Federal Reference Method (FRM) Size Selective Instruments (SSI) or Federal Equivalent Method (FEM) Beta Attenuation Monitor's, Model 1020 (BAM 1020). Effective 2017 Imperial County stopped utilizing FRM instruments relying solely on BAM 1020 monitors to measure PM_{10}. It is important to note that the use of non-regulatory data within this document, typically continuous PM_{10} data prior to 2013, measured in local conditions, does not cause or contribute to any significant differences in concentration difference or analysis.

As such, this report demonstrates that a naturally occurring event caused an exceedance observed on March 30, 2017, which elevated particulate matter within San Diego, Riverside, Imperial and Yuma Counties and affected air quality. The analyses contained in this report includes regulatory and non-regulatory data that provides support for the elements listed in **Table 1-1** and **Table 1-2**. This demonstration substantiates that this event meets the definition of the US EPA Regulation for the Treatment of Data Influenced by Exceptional Events (EER)[2].

I.1 Public Notification [40 CFR §50.14(c)(1)]

The ICAPCD utilizes a web-based public notification process to alert the public of forecasted weather conditions and potential changes in ambient air concentrations that may affect the public. The ICAPCD identifies these public notifications as Advisory Events. On Thursday, March 30, 2017 the ICAPCD advised the public of "Severe potentially damaging winds…" along the mountains and deserts. **Appendix C** contains copies of notices pertinent to the March 30, 2017 event.

I.2 Initial Notification of Potential Exceptional Event (INPEE) [40 CFR §50.14(c)(2)]

When States intend to request the exclusion of one or more exceedances of a NAAQS as an exceptional event a notification to the Administrator is required. The notification process identified within the EER as the Initial Notification of Potential Exceptional Event (INPEE) is twofold: to determine whether identified data may affect a regulatory decision and whether a State should develop/submit an EE Demonstration.

On March 30, 2017, a naturally occurring event elevated particulate matter within San Diego, Riverside, Imperial and Yuma Counties, causing an exceedance at the Calexico ((06-025-0005), Brawley (06-025-0007), El Centro (06-025-1003), Niland (06-025-4004), and Westmorland (06-025-4003) air quality monitors. Subsequently, the ICAPCD made a formal written request to the California Air Resources Board (CARB) to place preliminary flags on SLAMS measured PM_{10} hourly concentrations from the Calexico, Brawley, El Centro, Niland, and Westmorland monitors on March 30, 2017. After review, CARB submitted the INPEE, for the March 30, 2017 event in July of 2018. The submitted request included a brief description of the meteorological conditions for March 30, 2017, indicating that a potential natural event occurred. The ICAPCD has engaged in discussions with US EPA Region IX regarding the demonstration prior to formal submittal.

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[2] "Treatment of Data Influenced by Exceptional Events; Final Guidance", 81 FR 68216, October 2, 2016

I.3 Public Comment Process [40 CFR §50.14(c)(3)(v)(A-C)]

(A) The CARB and USEPA have reviewed and commented on the draft version of the March 30, 2017 exceptional event prepared by the ICAPCD. After addressing all substantive and non-substantive comments by both CARB and USEPA the ICAPCD has published a notice of availability in the Imperial Valley Press announcing a 30-day public review process. The published notice invites comments by the public regarding the request, by the ICAPCD, to exclude the measured concentrations of 180 $\mu g/m^3$ measured by the Brawley monitor; 167 $\mu g/m^3$ measured by the Calexico monitor; 196 $\mu g/m^3$ measured by the El Centro monitor; 227 $\mu g/m^3$ measured by the Niland monitor and 214 $\mu g/m^3$measured by the Westmorland monitor on March 30, 2017.

(B) Concurrently with the Public Review period for the March 30, 2017 exceptional event, the ICAPCD is formally submitting to CARB for remittance to USEPA the Draft March 30, 2017 exceptional event.

(C) Upon the ending of the review period the ICAPCD will remit to CARB and USEPA all comments received during the Public Review period along with a formal letter addressing any comments that dispute or contradict factual evidence in the demonstration.

The ICAPCD acknowledges that with the submittal to US EPA of the 2017 exceptional events, there is supporting evidence of documented recurring seasonal events that affect air quality in Imperial County.

I.4 Mitigation of Exceptional Events [40 CFR §51.930]

According to 40 CFR §51.930(b) all States having areas with historically documented or known seasonal events, three events or event seasons of the same type and pollutant that recur in a 3-year period, are required to develop and submit a mitigation plan to the US EPA.

The ICAPCD received notice from US EPA September 15, 2016 identifying Imperial County as an area required to develop and submit a mitigation plan within two years of the effective date, September 30, 2016, of the final published notification to states with areas subject to mitigation requirements. On September 21, 2018, after notice and opportunity for public comment the ICAPCD submitted the High Wind Exceptional Event Fugitive Dust Mitigation Plan (Mitigation Plan) for review and verification. Subsequently, on November 28, 2018 CARB received verification from US EPA of its review and approval of the

Mitigation Plan. For a copy of the Mitigation Plan visit the Imperial County Air Pollution Control District website at https://www.co.imperial.ca.us/AirPollution/otherpdfs/MitigationPlan.pdf.

The Imperial County Mitigation Plan contains important geographical and meteorological descriptions, pages 3 through 6, of the areas within Imperial County and the surrounding areas that are sources of transported fugitive dust. **Figure 1-1** helps depict the geological aspects that are within Imperial County and outside of Imperial County that affect air quality.

Essentially, the Anza-Borrego Desert State Park, which lies in a unique geologic setting along the western margin of the Salton Trough, extends north from the Gulf of California (Baja California) to the San Gorgonio Pass and from the eastern rim of the Peninsular Ranges eastward to the San Andreas Fault zone along the far side of the Coachella Valley. These areas are sources of transported fugitive dust emissions into Imperial County when westerly winds funnel through the unique landforms causing in some cases wind tunnels that cause increase in wind speeds.

During the monsoonal season, natural open desert areas to the east, southeast, and south of Imperial County are sources of transported fugitive dust emissions when thunderstorms cause outflows to blow winds across natural opens desert areas within Arizona and Mexico.

FIGURE 1-1
IMPERIAL COUNTY

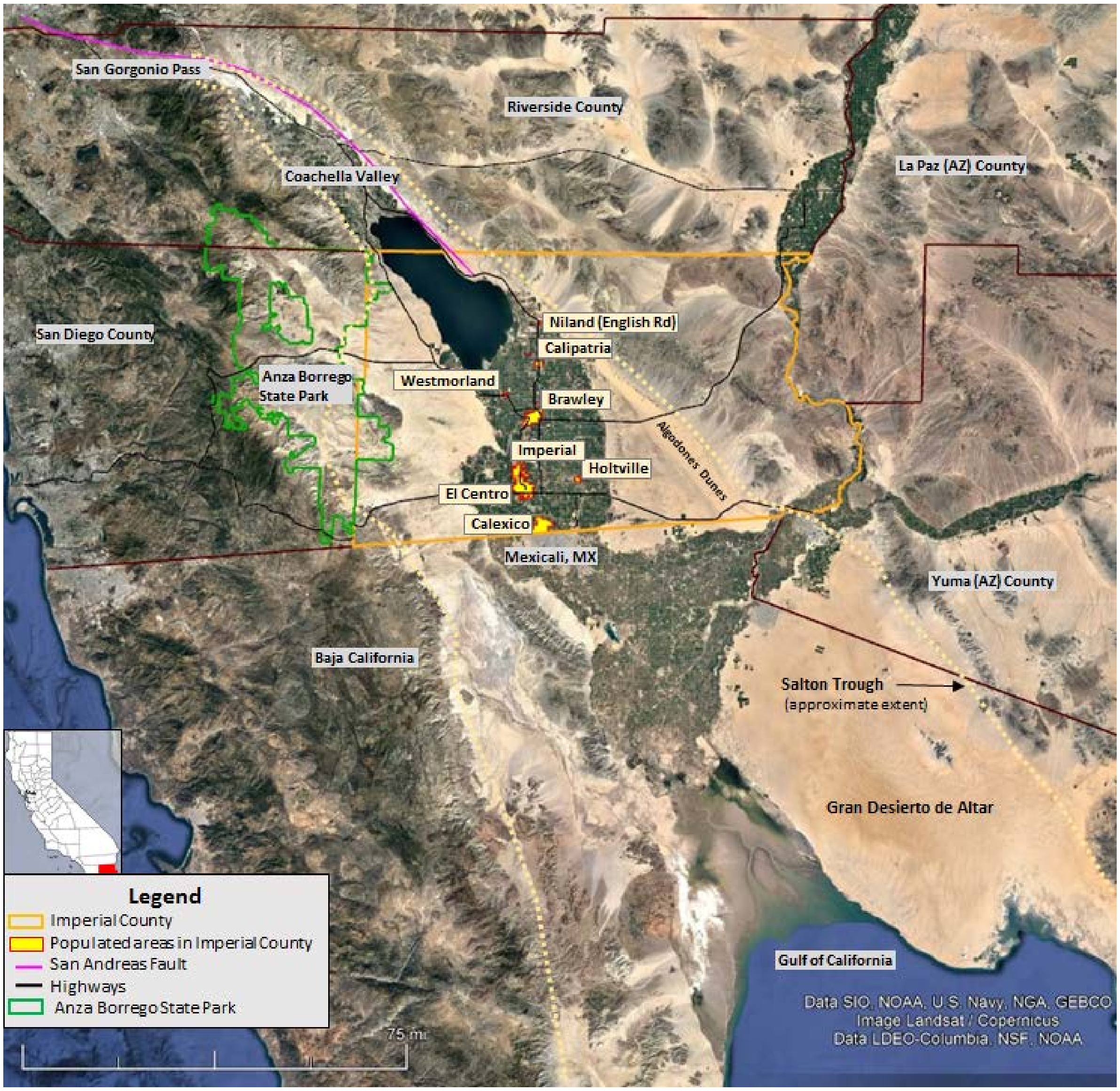


Fig 1-1: Imperial County a Southern California border region, within far southeast California bordering Arizona and Mexico has a small economically diverse region with a population of 174,528

Likewise, the Mitigation Plan contains a high wind event meteorological analysis broken down into four types of seasonal natural occurrences that cause elevated particulate matter that affects Imperial, San Diego, Riverside and Yuma Counties. The historical analysis has defined the meteorological events that lead to high winds and elevated PM_{10} events in Imperial County, page 7, as follows:

- **Type 1:** Pacific storms and frontal passages;
- **Type 2:** Strong pressure and surface pressure gradients;
- **Type 3:** Monsoonal Gulf Surges from Mexico; thunderstorm downburst, outflow winds and gust fronts from thunderstorms
- **Type 4:** Santa Ana wind events

A complete description of these events begins on page 8 of the Mitigation Plan. While there is some overlap in discussed components between the Mitigation Plan and this demonstration such as the public notification process and the warning process, the Mitigation Plan does elaborate a little further. The Mitigation Plan discusses in detail the educational component, the notification component, the warning component and the implementation of existing mitigation measures, such as Regulation VIII.

Finally, the Mitigation Plan contains a complete description of the methods, processes and mechanisms used to minimize the public exposure, page 14, retain historical and real-time data, page 15, and the consultation process with other air quality managers to abate and minimize air impacts within Imperial County, page 16.

In all, the Mitigation Plan helps explain the recurring events, by type and influence upon Imperial County and provides supporting justification of a natural event.[3]

[3] Title 40 Code of Federal Regulations §50.1 (k) defines a Natural Event as meaning an event and its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. For purposes of the definition of a natural event, anthropogenic sources that are reasonably controlled shall be considered to not play a direct role in causing emissions.

FIGURE 1-2
MONITORING SITES IN AND AROUND IMPERIAL COUNTY

Fig 1-2: Depicts a select group of PM_{10} monitoring sites in Imperial County, eastern Riverside County, and southwestern Arizona (Yuma County). Generated through Google Earth

II Conceptual Model – A narrative that describes the event causing the exceedance and a discussion of how emissions from the event led to the exceedance at the affected monitor

II.1 Description of the event causing the exceedance

Days before and during Thursday, March 30, 2017, the National Weather Service (NWS) office in San Diego described a closed low pressure system moving inland into the Great Basin on Thursday, March 30, 2017. The NWS indicated that in advance of this low-pressure system stronger onshore flow would develop on Thursday, March 30, 2017 with gusty west winds in the mountains and deserts within San Diego.

As a result, the San Diego NWS began issuing High Wind Watches for impacted areas such as Palm Desert, La Quinta, Coachella, Borrego Springs and Desert Hot Springs. High Wind Watches were replaced by High Wind Warnings by 613 pm PDT on March 30, 2017. The interpreted forecast models by the San Diego NWS office indicated very strong westerly winds developing Thursday morning, becoming strong and gusty during the afternoon, and peaking during the evening. The Weather Story issued by the San Diego NWS office indicated "Severe Mountain and Desert Winds" with winds peaking during the afternoon and evening hours of March 30, 2017. With the elevated winds, blowing dust and sand was expected to reduce visibility.

Likewise, the Phoenix NWS office began issuing forecast discussions identifying the approaching weather system into the desert southwest. While the Phoenix NWS office began issuing wind advisories, at little later than the San Diego office, a Wind Advisory was issued for Imperial County by 539 pm MST March 29, 2017. Like San Diego, the Phoenix office identified west winds with gusts up to 45 mph resulting from a strong cold front advancing east and southeastward across southwest Arizona. These winds brought widespread blowing dust with visibility under one mile. As such, by 1016 am MST the Phoenix NWS office issued its first Blowing Dust Advisory for Imperial County. Finally, by 910 pm, March 30, 2017, the Phoenix NWS office issued a Public Information Statement identifying the maximum wind reports. In Imperial County, Coyote Wells measured 60 mph, while Niand measured 44 mph. **Appendix A** contains all pertinent NWS notices.

II.2 How emissions from the event led to an exceedance

On March 30, 2017, the air quality monitors in Imperial, Riverside and Yuma counties measured elevated concentrations of particulate matter when strong gusty west winds, preceding a powerful low-pressure trough that moved across the Great Basin, blew across the San Diego Mountains and deserts eastward towards Arizona. These severe winds generated emissions from the mountain tops, within San Diego County, onto the deserts during the afternoon and evening hours causing a regional affect from the West Coast to Arizona. The blowing dust and sand created the perfect windblown dust scenario affecting air quality in Imperial County and causing an exceedance of all the air quality monitors within Imperial County. (**Table 2-1**).

FIGURE 2-1
MONITORING AND METEOROLOGICAL SITES

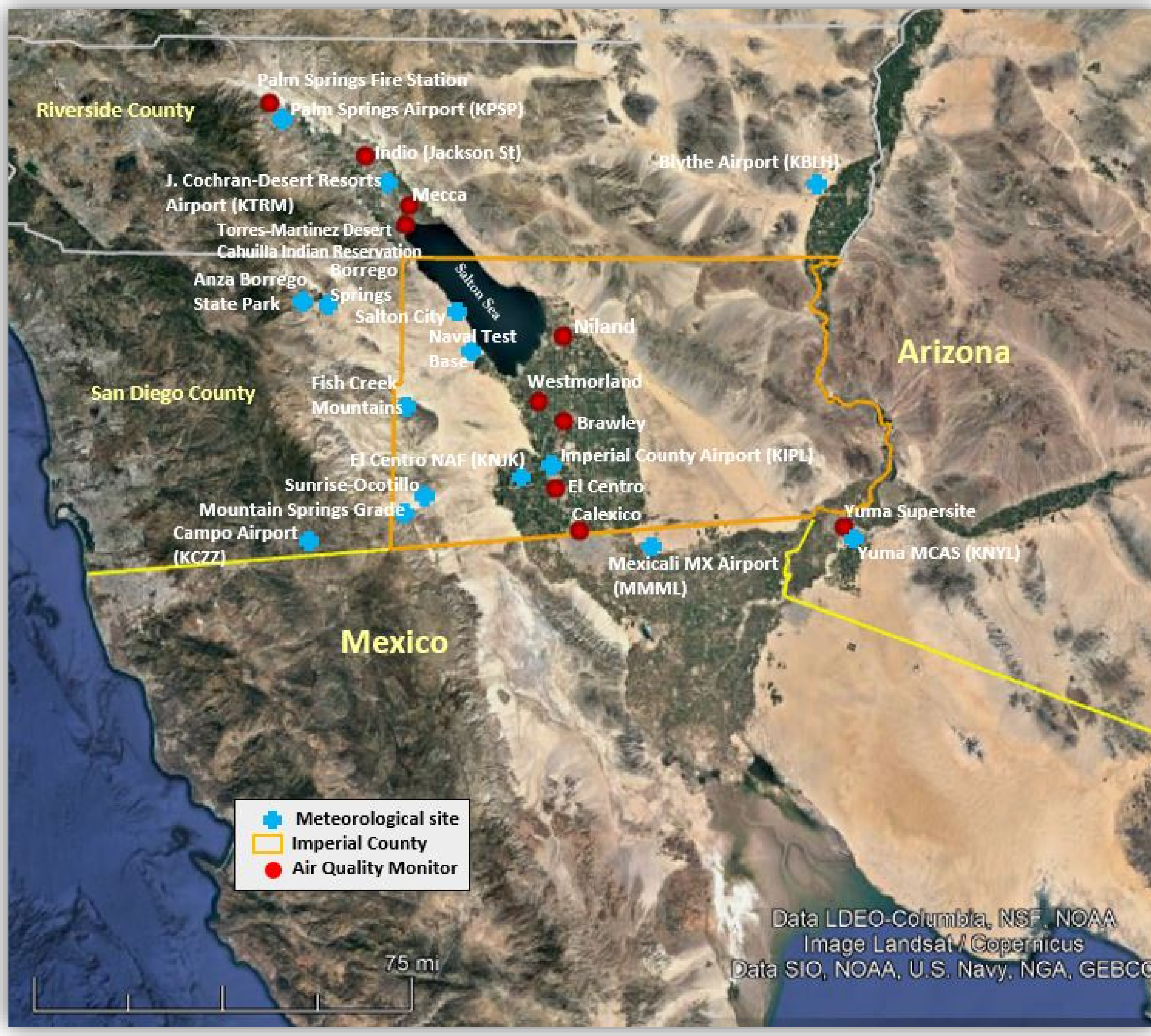


Fig 2-1: Includes a general location of the sites used in this analysis. The site furthest south is in Mexicali, Mexico and the site furthest north is the Palm Springs Fire Station

TABLE 2-1
HOURLY CONCENTRATIONS OF PARTICULATE MATTER

Site	Date	000	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Hrly MAX	24-Hr AVERAGE
PS FIRE STATION	20170329	4	6	6	6	9	9	15	31	11	14	19	5	6	17	6	7	10	26	30	32	26	14	13	19	32	14
	20170330	11	21	16	14	17	17	21	18	20	18	22	21	26	34	143	50	159	171	21	75	26	35	59	54	**171**	44
	20170331	46	24	23	25	19	20	27	25	25	23	25	24	28	28	25	26	33	37	39	35	31	28	28	25	46	27
INDIO	20170329	16	7	12	8	11	15	44	56	63	18	4	8	5	5	7	7	9	31	24	46	43	33	26	20	63	21
	20170330	20	21	20	29	30	34	87	60	37	20	30	27	18	517	420	91	65	142	134	86	391	165	64	67	**517**	107
	20170331	48	44	32	24	25	32	31	26	33	28	26	26	33	27	32	34	38	31	47	39	37	35	30	32	48	32
MECCA	20170329	9	18	16	14	14	34	59	67	22	23	5	22	14	17	11	26	43	25	4	13	47	47	33	40	67	25
	20170330	32	24	16	13	43	56	69	75	13	19	20	30	27	14	815	1160	346	241	1474	736	827	976	81	70	**1474**	299
	20170331	60	48	39	31	25	33	59	30	23	22	23	40	34	34	31	37	44	49	63	29	42	45	34	28	63	37
TORRES MARTINEZ	20170329	30	9	19	11	22	84	104	37	31	52	20	7	7	12	15	16	18	58	43	10	33	19	13	18	104	28
	20170330	22	23	23	15	19	203	100	71		31	33	26	63	541	1895	1933	744	1419	1079	1087	496	675	374	88	**1933**	476
	20170331	46	43	29	28	29	46	72	47	35	32	30	31		34	35	30	29	66	61	53	39	47	40	40	72	40
WESTMORLAND	20170329	11	15	10	12	14	48	86	32	15	48	19	8	8	7	5	4	4	38	27	14	22	31	25	14	86	21
	20170330	13	11	22	13	25	42	51	45	50	28	14	30	83	201	142	577	525	995	995	995	113	61	78	35	**995**	214
	20170331	57	120	75	48	39	36	35	29		29	43	42	35	35	27	29	26	39	60	34	36	34	30	29	120	42
BRAWLEY	20170329	13	13	9	26	16	33	169	35	26	25	21	7	12	8	7	9	9	15	38	52	35	31	21	24	169	27
	20170330	10	21	27	28	29	36	50	44	68	41	12	9	97	146	91	274	367	651	995	995	152	69	73	48	**995**	180
	20170331	55	87	80	49	41	47	42	38	36	34	46		41	35	31	29	28	24	32	47	41	37	30	33	87	41
NILAND	20170329	5	44	17	13	15	15	14	9	24	2	4	3	9	6	10	5	0	1	250	86	64	11	10	9	250	26
	20170330	10	11	15	20	21	34	64	55	27	34	49	31	22	150	436	534	995	995	995	516	79	189	109	69	**995**	227
	20170331	77	53	46	36	30	27	31	30	26		42	33	36	35	35	39	24	24	389	232	60	81	69	42	389	65
EL CENTRO	20170329	14	14	19	14	28	36	58	70	20	12	17	15	13	9	5	8	6	10	57	120	103	35	24	15	120	30
	20170330	16	17	8	20	64	63	96	95	81	59	26	17	114	76	148	259	181	416	126	995	552	360	688	227	**995**	196
	20170331	169	217	133	48	40	58	50		37	30	35	29	28	22	26	20	20	27	39	53	40	40	37	36	217	53
CALEXICO	20170329	18	17	22	32	28	45	95	93	21	23	18	21	18	8	13	11	22	18	45	100	133	129	123	115	133	48
	20170330	120	101	97	65	44	66	106	163	110	72	58	50	30	203	154	201	178	498	515	630	180	203	70	105	**630**	167
	20170331	58	141	66	40	43	46	137	50	49	33	41	33	32	34	33	48	33	40	42	62	58	50	40	50	141	52
YUMA SUPERSITE **(PST)**	20170329	22	16	14	7	12	34	40	34	56	42	18	16	28	12	16	9	40	19	28	42	38	41	46	44	56	28
	20170330	31	24	28	35	68	92	95	88	30	31	36	42	61	63	61	62	122	80	92	415	597	493	376	221	**597**	135
	20170331	193	133	128	85	118	83	64	72	59	84	85	51	68	66	58	56	48	53	59	59	55	61	90	51	193	78
YUMA SUPERSITE **(MST)**	20170328	51	47	42	59	96	48	99	55	52	102	68	35	83	64	84	48	29	27	30	67	22	29	22	20	102	53
	20170329	22	22	16	14	7	12	34	40	34	56	42	18	16	28	12	16	9	40	19	28	42	38	41	46	56	27
	20170330	44	31	24	28	35	68	92	95	88	30	31	36	42	61	63	61	62	122	80	92	415	597	493	376	**597**	127
	20170331	221	193	133	128	85	118	83	64	72	59	84	85	51	68	66	58	56	48	53	59	59	55	61	90	221	85
	20170401	51	47	42	40	45	57	61	81	57	50	48	38	44	79	75	22	28	18	18	22	28	25	30	25	81	42

Color coding information – **Red bold** highlighted sites indicate sites that exceeded the NAAQS. **Bold Blue** dates indicate date of Exceptional Event. **Red fill and Red bold** hourly concentrations represent concentrations above 100 µg/m^3. Pink squares around concentrations identify peak hourly concentrations

FIGURE 2-2
CONCENTRATIONS FOR ALL SITES LISTED IN TABLE 2-1

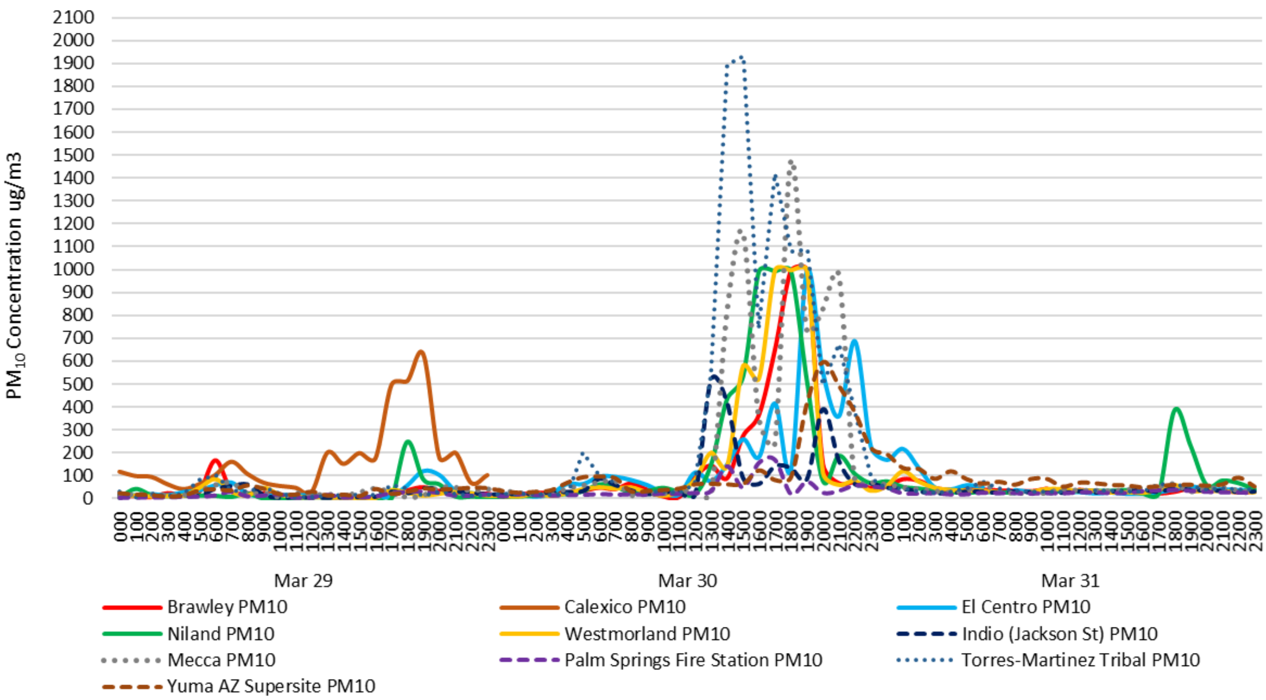


Fig 2-2: is a three-day graphical representation of the PM_{10} concentrations measured at the sites identified in **Table 2-1**

Wind speed, wind direction and the airflow patterns combined help explain how the windblown emissions resulting from the prefrontal westerly winds associated with the passing of the powerful low-pressure trough affected the air quality monitors in Imperial County.

As mentioned above, the early weather forecast notices issued by both the San Diego and Phoenix NWS offices indicated a strong low-pressure trough approaching southern California by Thursday, March 30, 2017. The multiple Urgent Weather notices, issued by both NWS offices, confirmed the intensity of the weather system as it approached the region. The evening Area Forecast discussions issued by both the San Diego and Phoenix NWS office each give an explanation of the approaching system and the effect of the strong gusty west winds. Both offices describe blowing dust and sand caused by severe gusty westerly winds (**Appendix A**). Finally, an issued "Descriptive Text Narrative For Smoke/Dust Observed in Satellite Imagery…" identifies "significant blowing dust event underway over a broad portion of the Southwestern US." (**Appendix C**).

Figures 2-3 and 2-4 depict the compiled wind data for regional and neighboring airports and upstream sites. Airports within Imperial, Riverside and Yuma Counties measured wind speeds at or above 25 mph or measured wind gusts at or above 25 mph.

FIGURE 2-3
LOCAL AND VICINITY AIRPORT WIND SPEEDS AND GUSTS

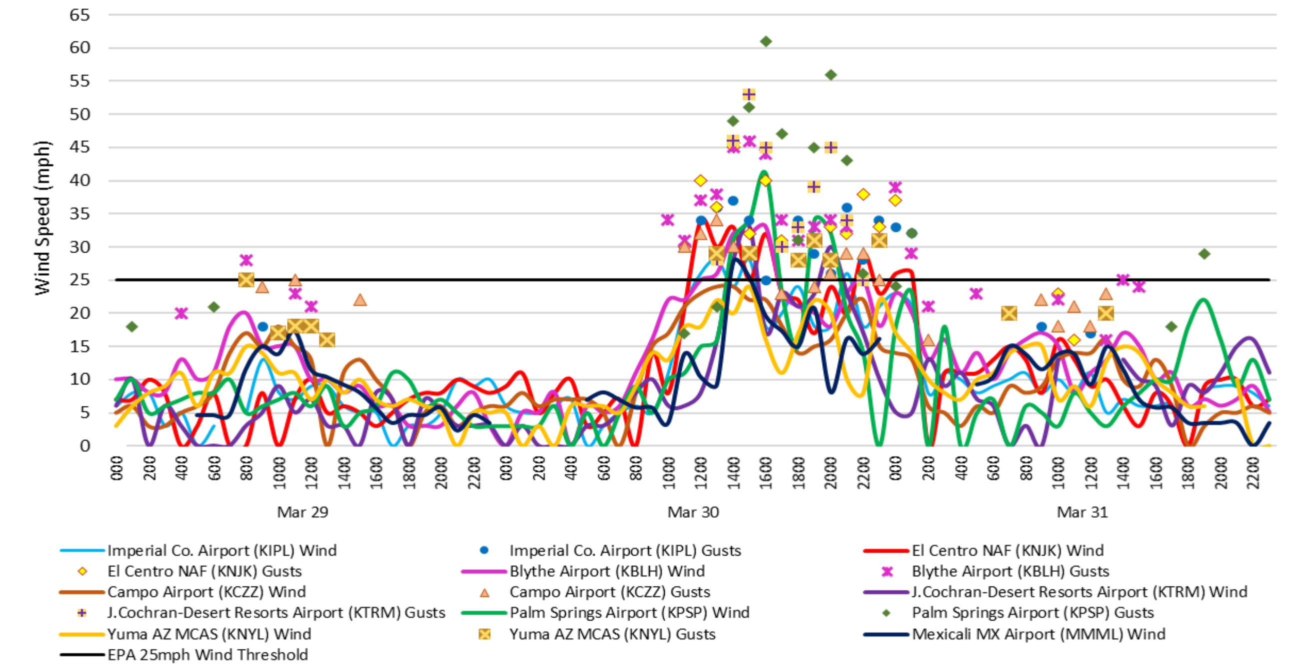


Fig 2-3: is a three-day graphical representation of the measured wind speed and wind gusts (if available) from local and neighboring airports. Note the elevated wind speeds are consistent for sites with minor variations. All data (except MMML from MesoWest) derived from the Local Climatological Data Hourly Observations (LCDHO) reports released by the NOAA https://www.ncdc.noaa.gov/

Sites in the west and southwest areas of Imperial County, particularly Mountain Springs Grade on the desert slopes (elevation 2,044 feet), measured elevated wind speeds much sooner than sites farther east or within urbanized centers, coincident with measured elevated concentrations.

FIGURE 2-4
WIND SPEEDS AND GUSTS UPSTREAM SITES

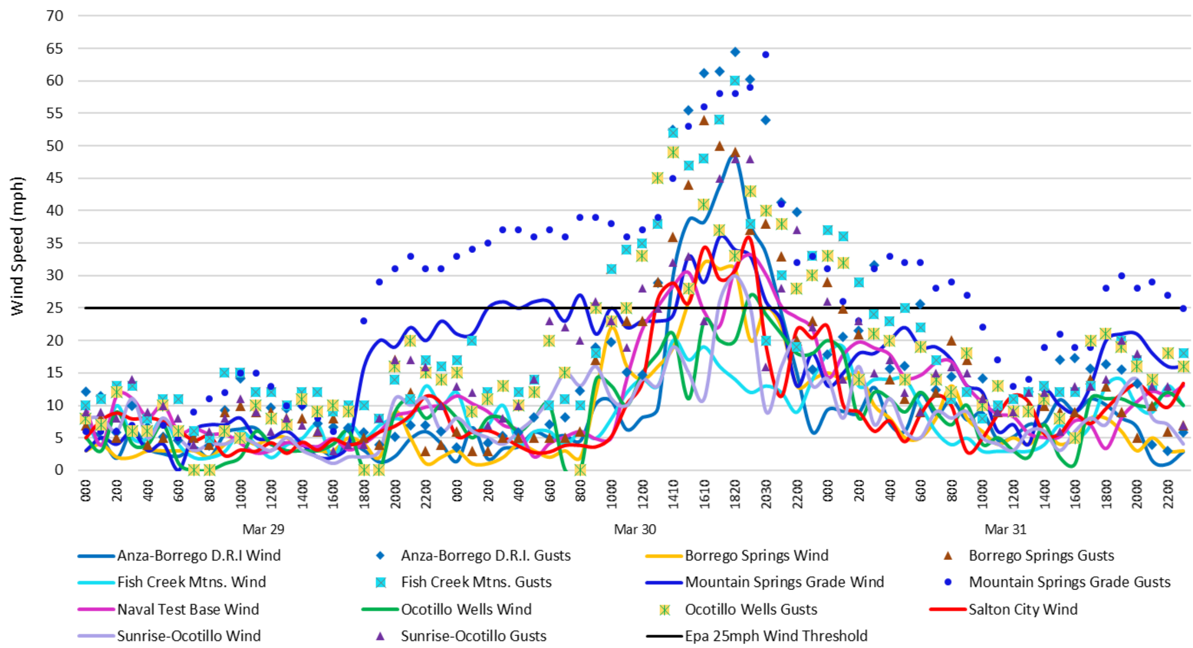


Fig 2-4: is a three-day graphical representation of the measured wind speed and wind gust (if available) from sites located upstream from the Niland monitor. All data derived from the University of Utah's MesoWest https://mesowest.utah.edu/index.html

The National Oceanic and Atmospheric Administration (NOAA) Laboratory HYSPLIT back-trajectory models[4] provide supporting evidence of the westerly airflow within Imperial County on March 30, 2017. The 6-hour HYSPLIT back-trajectory model **Figure 2-5** represent the 1200 PST hour when the El Centro monitor first measured an elevated concentration above 100 µg/m^3, just an hour prior to the other monitors measuring large spikes in hourly concentrations. **Figure 2-6** represent the modeled back-trajectory air flow of regulatory monitors (along with Torres-Martinez) for the 12 hours ending 1900 PST. This was during the hour when all ICAPCD monitors were measuring peak hourly concentrations.

[4] 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. Used, currently, 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 2-5
HYSPLIT MODEL IMPERIAL COUNTY SITES MARCH 30, 2017 1200 PST

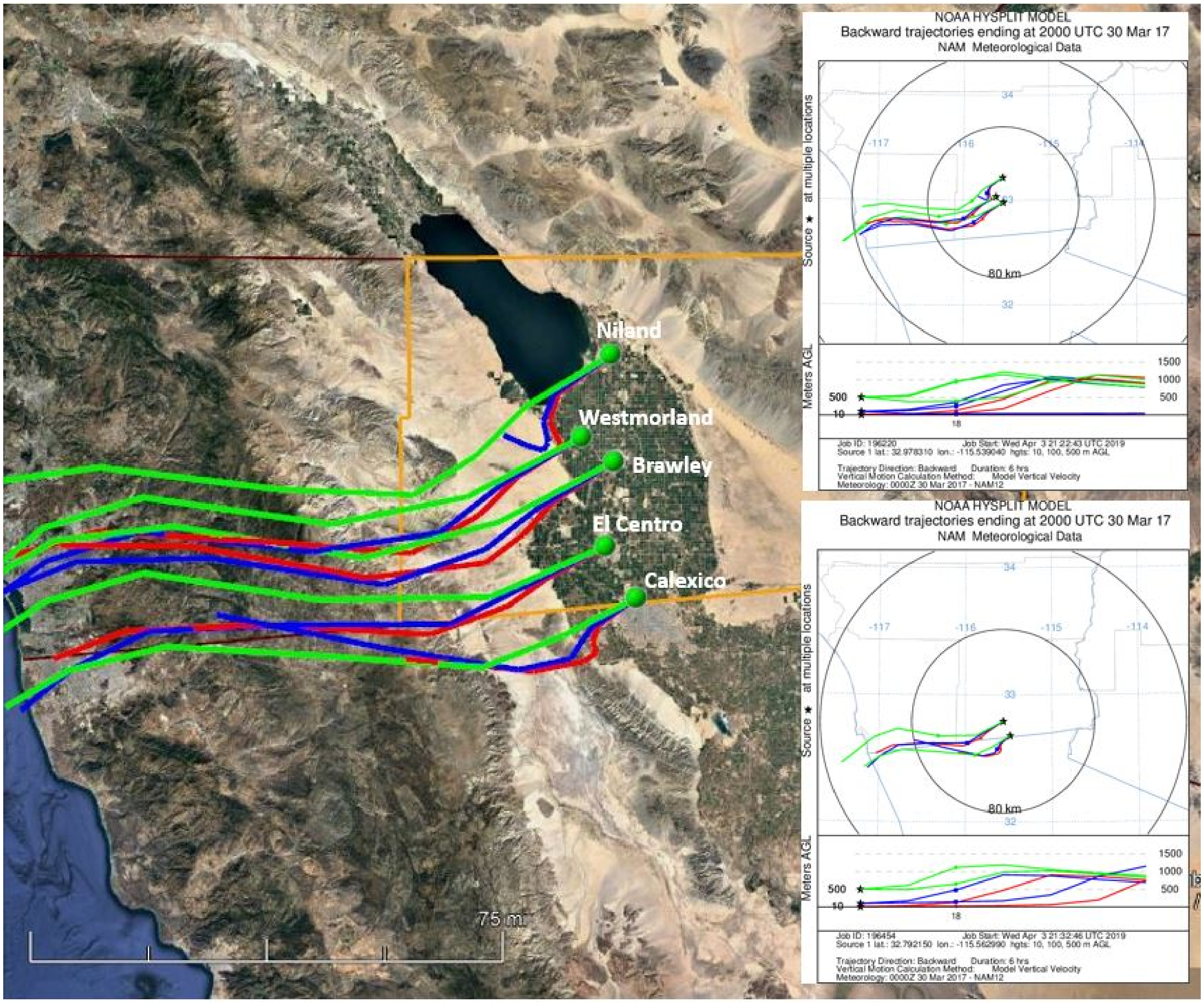


Fig 2-5: A 6-hour back-trajectory ending at 1200 PST for all ICAPCD monitors identified in **Table 2-1**. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

FIGURE 2-6
HYSPLIT MODEL ALL SITES MARCH 30, 2017 1900 PST

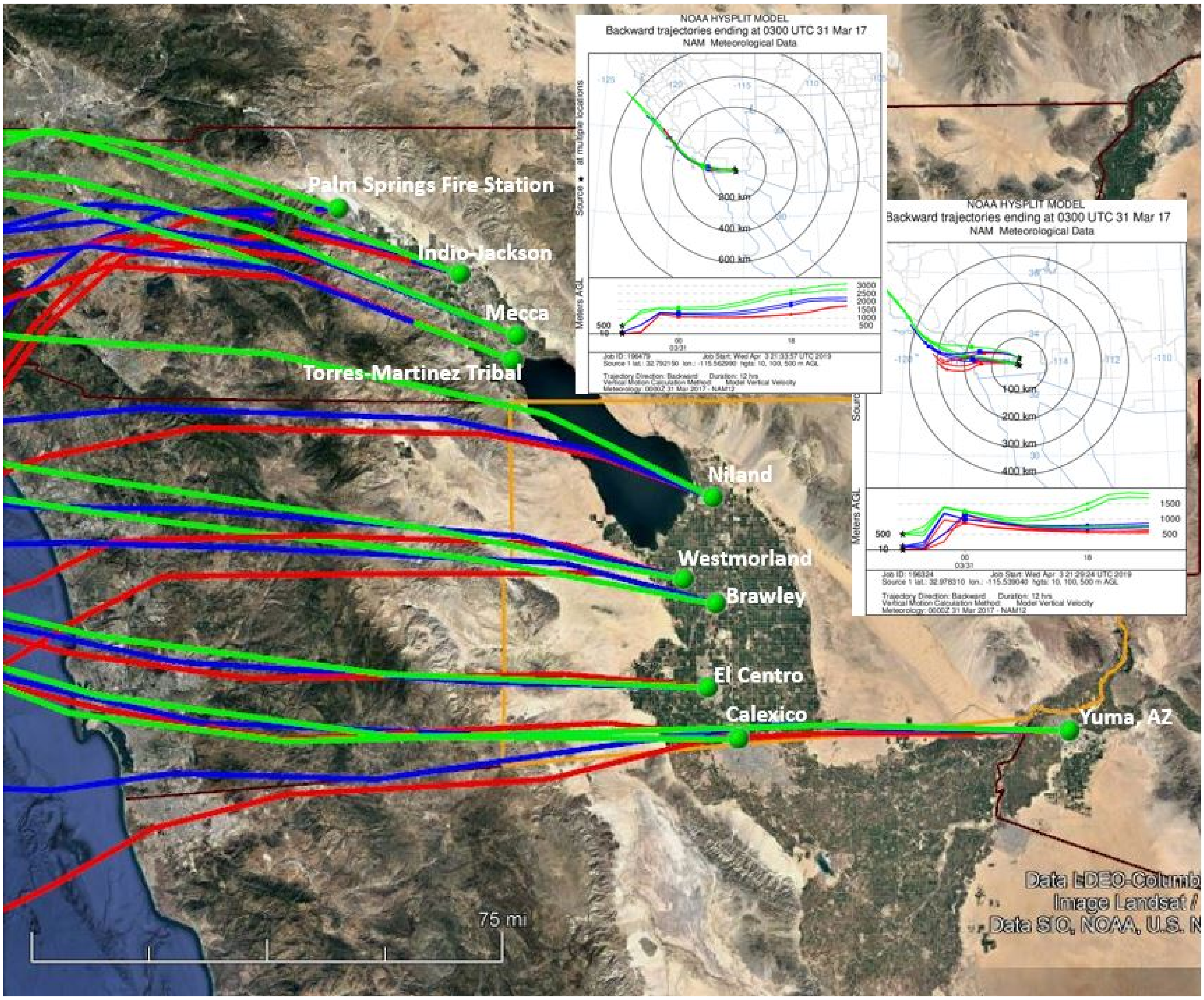


Fig 2-6: A 12-hour back-trajectory ending at 1900 PST for all sites identified in **Table 2-1**. Note the surface level airflow is now more westerly than the first image, as forecast by the NWS notices. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

As westerly winds accompanied by strong gusts winds blew over open natural desert areas west of Imperial County, fugitive windblown dust caused all of the ICAPCD monitors to exceed the NAAQS. Westmorland and Niland, the two monitors not located within a more urbanized area had the highest 24-hour average concentrations. The hours of peak concentrations in the late afternoon and early evening coincided with the period when wind speeds and gusts were at their maximum as measured by local upstream meteorological instruments. Both local airports measured winds in excess of 25 mph, with gusts near or above 40 mph. Mountain Springs Grade on the desert slopes had winds of

36 mph and gusts of 64 mph. Borrego Springs, the Naval Test Base, Salton City, and Sunrise-Ocotillo, all on or near the desert floor, had winds in far excess of 25 mph. The Fish Creek Mountains on the western edge of Imperial County, had peak gusts of 60 mph during the evening.

III Clear Causal Relationship – A demonstration that the event affected air quality illustrating the relationship between the event and the monitored exceedance

As mentioned above, the strong low-pressure system moving over the Great Basin was responsible for the strong winds across southern California and western Arizona. Conditions were aggravated by the lack of accompanying moisture with the weather disturbance. The San Diego NWS office forecast that although the trough would be "starved for moisture" it would "introduce a very strong pressure gradient over SoCal" (*NWS San Diego Area Forecast Discussion, 0322 PDT March 30).* The strong winds and lack of moisture were a factor in the windblown dust from outlaying open natural desert areas, located to the west of Imperial County, being transported into Imperial County and causing an exceedance at all ICAPCD monitors.

While elevated wind speeds play a significant and important role in the transportation of dust, gusts play an equally significant role in deposition of particulates onto a monitor and the overall affect onto ambient air.[5] Automated meteorological instruments at Anza Borrego State Park, the Fish Creek Mountains, and Mountain Springs Grade all measured gusts at or above 60 mph. Borrego Springs had a peak gust of 54 mph, while Ocotillo Wells had a gust of 49 mph.

As winds increased on March 30, 2017 and windblown dust from outlaying open deserts entered Imperial County, air quality degraded. As mentioned in section I.1 above, the ICAPCD issued an advisory of the potential for elevated particulate matter and the potential of degradation of air quality to a moderate or unhealthy level. In addition, the NWS Phoenix and San Diego offices issued Urgent Weather Messages advising of the potential for increased winds and the associated impacts.

The San Diego NWS issued an Urgent Weather Message containing a High Wind Watch as early as 812 pm PDT on March 28, 2017. The watch included the San Diego County mountains and deserts and forecast westerly winds up to 45 mph with gusts to 65 mph on the desert slopes and foothills, and likely to produce areas of blowing dust and sand. The High Wind Watch was upgraded to a High Wind Warning late on March 29. The NWS Phoenix office issued a Wind Advisory for Imperial County at 539 pm MST on March 29, 2017 for winds of up to 30 mph with gusts to 40 mph. That was reinforced the morning of March 30, 2017 with a Blowing Dust Advisory for Imperial County, including eastern Riverside County and portions of western Arizona. The advisory described the possibility

[5] Gust is a rapid fluctuation of wind speed with variations of 10 knots or more between peaks and lulls; National Weather Service Glossary https://w1.weather.gov/glossary/index.php?letter=g

of reduced visibility due to blowing dust. In addition, the advisory described possible hazardous driving conditions on Interstate 10 and Interstate 8 due to crosswinds. Both the Blowing Dust and Wind Advisories expired at 2300 PDT on March 30, 2017 (**Appendix A**).

Figure 3-1 below provides an illustration of some of the meteorological conditions, as described above, for March 30, 2017, which affected air quality in Imperial County causing an exceedance of the NAAQS at all of the ICAPCD monitors. All of the monitors were directly in the flow of strong winds that swept across the natural open deserts to the west the Imperial County. The rural topography of the area provided little to no obstructions for the windblown dust that was transported into the heavily populated areas. Air quality in these areas was degraded as a result.

FIGURE 3-1
VISUAL RAMP-UP ANALYSIS AS DISCUSSED FOR MARCH 30, 2017

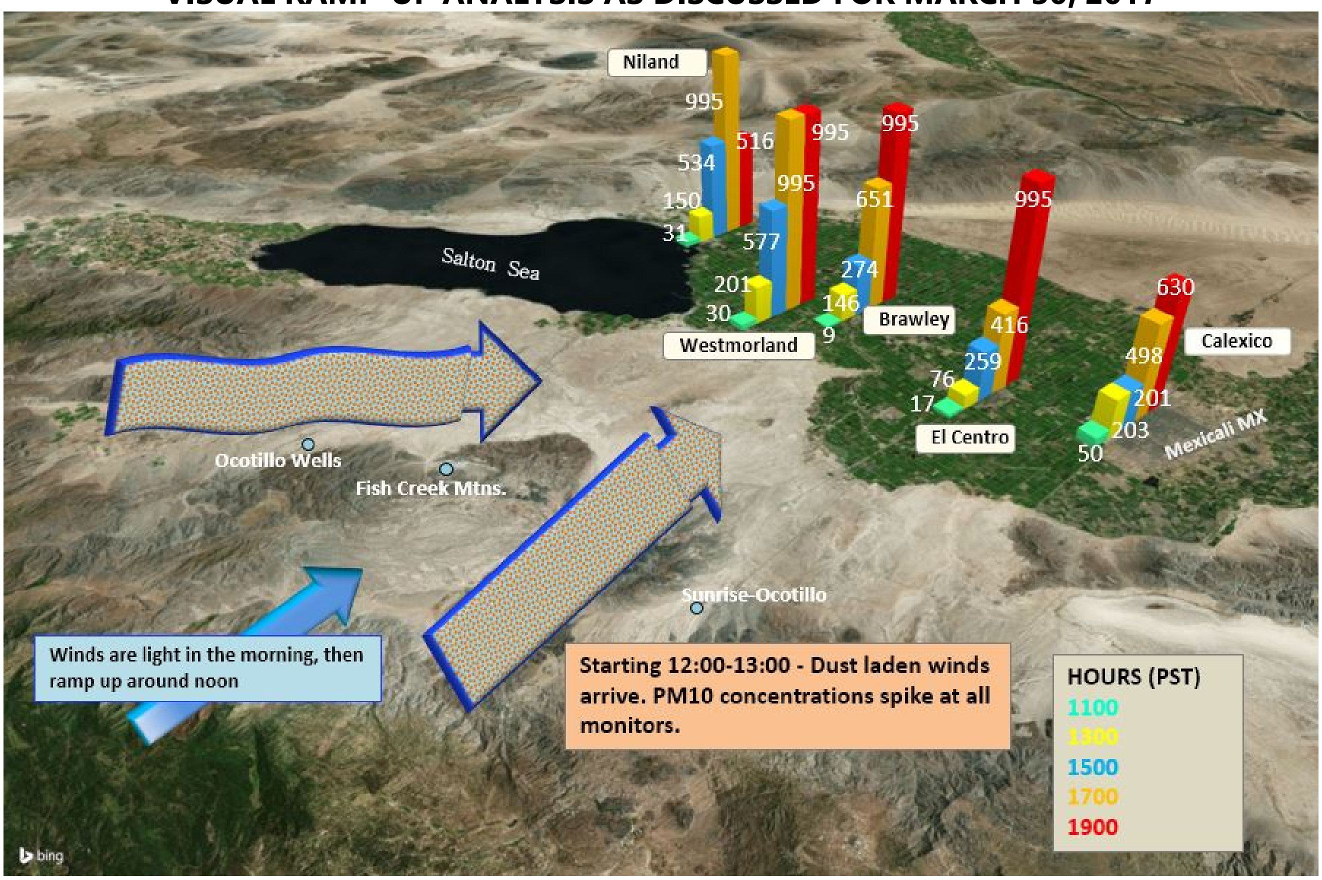


Fig 3-1: Gusty elevated westerly winds at upstream sites transported dust into Imperial County from as far west as San Diego County. Strong winds and gusts swept over the outlaying open natural desert areas to the west and over agricultural and urban areas. Note, arrows simply for effect and to give the read a general sense of the westerly direction of the winds. Air quality data is from the EPA's AQS data bank. Bing-Earthstar graphics base map

An indicator of the affect to air quality can be discerned from the level of visibility at any given time and day. While the ICAPCD air monitoring stations do not measure levels of visibility the local and surrounding airports record visibility.[6]

El Centro NAF (KNJK) and Imperial County Airport (KIPL) locally, and Jacqueline Cochran-Desert Resorts Airport (KTRM) and Palm Springs Airport (KPSP) to the northwest, all reported reduced visibility coincident with elevated wind speeds, wind gusts, and hourly concentrations of particulates. **Figure 3-2** and **Tables 3-1 to 3-6** provide information regarding the reduced visibility in Imperial County and the relation to hourly concentrations at local air monitors.

While **Figure 3-2** is a graphical representation of the reduced visibility within Imperial County and surrounding areas, **Tables 3-1 through 3-4** provide a temporal relationship of wind speeds, wind direction, wind gusts (if available), and PM_{10} concentrations at the Brawley, Calexico, El Centro, Niland, and Westmorland monitors. Together, the data provides the supporting relationship between the elevated winds, blowing dust and reduced visibility.

According to the compiled information found in **Figure 3-2,** visibility at KTRM and KPSP was reduced as early as 1400 PST. Visibility at KNJK and KIPL dropped significantly slightly later but coincident with the measured peak hourly concentrations at the Brawley, Calexico, El Centro, Niland, and Westmorland monitors.

As previously mentioned, a dust event was observed by satellites and identified by NOAA's Satellite Services Division Smoke Text Product. Although satellite imagery in the early evening detected a significant blowing dust event underway across a broad portion of the Southwest United States, the thickest area of dust was observed spreading eastward from southeastern California. (**Appendix C**).

[6] According to the NWS there is a difference between human visibility and the visibility measured by an Automated Surface Observing System (ASOS) or an Automated Weather Observing System (AWOS). The automated sensors measure clarity of the air vs. how far one can "see". The more moisture, dust, snow, rain, or particles in the light beam the more light scattered. The sensor measures the return every 30 seconds. The visibility value transmitted is the average 1-minute value from the past 10 minutes. The sensor samples only a small segment of the atmosphere, 0.75 feet. Therefore, a representative visibility utilizes an algorithm. Siting of the visibility sensor is critical and large areas should provide multiple sensors to provide a representative observation; http://www.nws.noaa.gov/asos/vsby.htm

FIGURE 3-2
72-HOUR TIME SERIES PM_{10} CONCENTRATIONS AND VISIBILITY

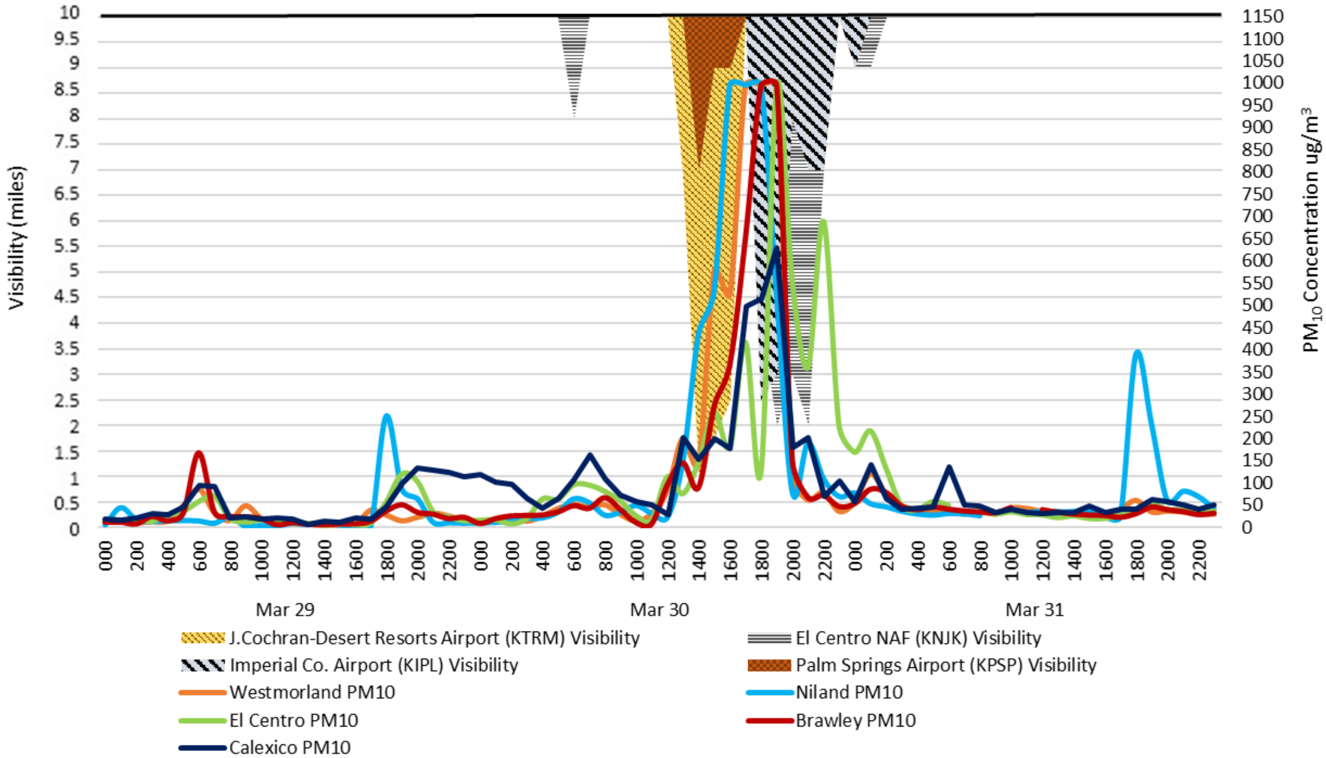


Fig 3-2: is a graphical representation of the compiled data from the Imperial County Airport (KIPL), the El Centro NAF (KNJK) Airfield, Palm Springs Regional Airport, and Jacqueline Cochran-Desert Resorts Regional Airport (KTRM). Reported reduced visibility is coincident with elevated winds and hourly levels of concentrations either just prior to peak concentrations or after. Visibility data from the NCEI's QCLCD data bank

Because the EPA accepts a high wind threshold for sustained winds of 25 mph in California and 12 other states[7] the **Tables 3-1 through 3-6** are provided in support of the relationship between the elevated winds and elevated concentrations. In each table the measured elevated concentrations of PM_{10} either follow or occur during periods of elevated winds or gusts. Each table has a select group of meteorological sites that compare the hourly winds with the closest measured hourly concentration at each site. Table 3-1 is a snap shot comparing select meteorological sites with all of the monitors.

[7] "Treatment of Data Influenced by Exceptional Events; Final Guidance", FR Vol. 81, No. 191, 68279, October 3, 2016

TABLE 3-1
WIND SPEEDS AND PM_{10} CONCENTRATIONS All SITES MARCH 30, 2017

	MOUNTAIN SPRINGS GRADE (TNSC1)			EL CENTRO NAF (KNJK)			FISH CREEK MTNS. (FHCC1)			ANZA-BORREGO (UCAB)			BRLY	WSTMLD	NLND	EC	CX
HOUR	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/G	W/D	PM_{10} (µg/m³)				
000	21	33	209	9		250	12	17	209	1	3	217	10	13	10	16	120
100	21	34	221	11		230	6	20	205	7	9	248	21	11	11	17	101
200	25	35	213	5		240	7	12	198	2	4	280	27	22	15	8	97
300	26	37	207	8		270	10	13	193	3	5	276	28	13	20	20	65
400	25	37	211	10		170	4	12	176	4	6	267	29	25	21	64	44
500	26	36	203	3		170	6	14	212	6	8	242	36	42	34	63	66
600	26	37	203	5		190	6	10	172	5	7	234	50	51	64	96	106
700	23	36	210	7		280	4	11	197	5	8	201	44	45	55	95	163
800	27	39	219	0		0	6	10	173	5	12	166	68	50	27	81	110
900	21	39	238	14		260	5	18	345	10	19	306	41	28	34	59	72
1000	25	38	211	8		230	8	31	300	11	20	231	12	14	49	26	58
1100	22	36	222	21	30	270	12	34	192	6	15	307	9	30	31	17	50
1200	23	37	240	34	40	250	14	35	279	8	15	94	97	83	22	114	30
1300	23	39	237	30	36	240	13	38	289	10	29	325	146	201	150	76	203
1400	24	45	223	33	45	240	20	52	241	30	53	274	91	142	436	148	154
1500	33	53	232	25	32	240	17	47	242	39	56	276	274	577	534	259	201
1600	29	56	222	32	40	250	19	48	270	38	61	261	367	525	995	181	178
1700	36	58	235	23	31	260	16	54	271	44	61	262	651	995	995	416	498
1800	34	58	221	22		300	14	60	279	48	64	264	995	995	995	126	515
1900	33	59	219	17		290	12	38	16	38	60	265	995	995	516	995	630
2000	26	64	236	24	33	310	13	20	117	33	54	264	152	113	79	552	180
2100	23	41	238	20	32	310	12	30	40	24	41	287	69	61	189	360	203
2200	13	32	242	29	38	310	9	19	355	15	40	282	73	78	109	688	70
2300	18	33	244	23	33	300	14	33	312	6	16	278	48	35	69	227	105

Wind data for KNJK from the NCEI's QCLCD system. Wind data for TNSC1 and FHCC1 and UCAB from the University of Utah's MesoWest system. Air quality data for Brawley, Calexico, El Centro, Niland, and Westmorland from the EPA's AQS Repository. Wind speeds = mph; Direction = degrees. Due to the different times that wind data and air quality data is sampled at various sites, the hour given represents the hour in which the measurement was taken

TABLE 3-2
WIND SPEEDS AND PM_{10} CONCENTRATIONS BRAWLEY MARCH 30, 2017

MOUNTAIN SPRINGS GRADE (TNSC1)				IMPERIAL COUNTY AIRPORT (KIPL)				EL CENTRO NAF (KNJK)					FISH CREEK MTNS. (FHCC1)				BRAWLEY	
HR	W/S	W/G	W/D	HR	W/S	W/G	W/D	HR	W/S	W/G	W/D	Obs.	HR	W/S	W/G	W/D	HR	PM_{10}
50	21	33	209	53	6		270	56	9		250		26	12	17	209	0	10
150	21	34	221	153	5		220	156	11		230		126	6	20	205	100	21
250	25	35	213	253	5		220	256	5		240		226	7	12	198	200	27
350	26	37	207	353	6		120	356	8		270		326	10	13	193	300	28
450	25	37	211	453	7		130	456	10		170		426	4	12	176	400	29
550	26	36	203	553	0		0	556	3		170		526	6	14	212	500	36
650	26	37	203	653	3		150	656	5		190		626	6	10	172	600	50
750	23	36	210	753	5		150	756	7		280		726	4	11	197	700	44
850	27	39	219	853	6		200	856	0		0		826	6	10	173	800	68
950	21	39	238	953	5		VRB	956	14		260		926	5	18	345	900	41
1050	25	38	211	1053	11		260	1056	8		230		1026	8	31	300	1000	12
1150	22	36	222	1153	21	30	270	1156	21	30	270		1126	12	34	192	1100	9
1250	23	37	240	1253	26	34	250	1256	34	40	250		1226	14	35	279	1200	97
1350	23	39	237	1353	28	36	250	1356	30	36	240		1326	13	38	289	1300	146
1450	24	45	223	1453	24	37	240	1456	33	45	240		1426	20	52	241	1400	91
1550	33	53	232	1553	28	34	230	1556	25	32	240		1526	17	47	242	1500	274
1650	29	56	222	1653	18	25	240	1656	32	40	250		1626	19	48	270	1600	367
1750	36	58	235	1753	20		250	1756	23	31	260		1726	16	54	271	1700	651
1850	34	58	221	1838	24	34	290	1847	22		300	DU	1826	14	60	279	1800	995
1950	33	59	219	1929	18	29	300	1939	17		290	DU	1926	12	38	16	1900	995
2050	26	64	236	2032	18	26	330	2056	24	33	310	DU	2026	13	20	117	2000	152
2150	23	41	238	2153	26	36	290	2156	20	32	310	DU	2126	12	30	40	2100	69
2250	13	32	242	2253	18	28	300	2256	29	38	310	DU	2226	9	19	355	2200	73
2350	18	33	244	2353	21	34	290	2356	23	33	300	DU	2326	14	33	312	2300	48

Wind data for KIPL and KNJK, from the NCEI's QCLCD system. Wind data for TNSC1 and FHCC1 from the University of Utah's MesoWest system. Wind speeds = mph; Direction = degrees. **DU** = widespread dust. Due to the different times that wind data and air quality data is sampled at various sites, the hour given represents the hour in which the measurement was taken

TABLE 3-3
WIND SPEEDS AND PM_{10} CONCENTRATIONS WESTMORLAND MARCH 30, 2017

MOUNTAIN SPRINGS GRADE (TNSC1)				FISH CREEK MTNS. (FHCC1)				EL CENTRO NAF (KNJK)					WESTMORLAND			
HR	W/S	W/G	W/D	HR	W/S	W/G	W/D	HR	W/S	W/G	W/D	Obs.	HR	W/S	W/D	PM_{10}
050	21	33	209	026	12	17	209	056	9		250		000	3	197	13
150	21	34	221	126	6	20	205	156	11		230		100	3	158	11
250	25	35	213	226	7	12	198	256	5		240		200	3	147	22
350	26	37	207	326	10	13	193	356	8		270		300	2	213	13
450	25	37	211	426	4	12	176	456	10		170		400	4	146	25
550	26	36	203	526	6	14	212	556	3		170		500	7	158	42
650	26	37	203	626	6	10	172	656	5		190		600	6	151	51
750	23	36	210	726	4	11	197	756	7		280		700	3	138	45
850	27	39	219	826	6	10	173	856	0		0		800	5	155	50
950	21	39	238	926	5	18	345	956	14		260		900	1	201	28
1050	25	38	211	1026	8	31	300	1056	8		230		1000	5	177	14
1150	22	36	222	1126	12	34	192	1156	21	30	270		1100	6	225	30
1250	23	37	240	1226	14	35	279	1256	34	40	250		1200	7	251	83
1350	23	39	237	1326	13	38	289	1356	30	36	240		1300	13	227	201
1450	24	45	223	1426	20	52	241	1456	33	45	240		1400	11	261	142
1550	33	53	232	1526	17	47	242	1556	25	32	240		1500	19	279	577
1650	29	56	222	1626	19	48	270	1656	32	40	250		1600	20	273	525
1750	36	58	235	1726	16	54	271	1756	23	31	260		1700	24	273	995
1850	34	58	221	1826	14	60	279	1847	22		300	DU	1800	25	289	995
1950	33	59	219	1926	12	38	16	1939	17		290	DU	1900	14	305	995
2050	26	64	236	2026	13	20	117	2056	24	33	310	DU	2000	14	294	113
2150	23	41	238	2126	12	30	40	2156	20	32	310	DU	2100	14	292	61
2250	13	32	242	2226	9	19	355	2256	29	38	310	DU	2200	16	289	78
2350	18	33	244	2326	14	33	312	2356	23	33	300	DU	2300	11	303	35

Wind data for KNJK from the NCEI's QCLCD system. Wind data for TNSC1 and IMPSD from the University of Utah's MesoWest system. Wind data for Calexico from the EPA's AQS Repository. Wind speeds = mph; Direction = degrees. **DU** = widespread dust. Due to the different times that wind data and air quality data is sampled at various sites, the hour given represents the hour in which the measurement was taken

TABLE 3-4
WIND SPEEDS AND PM_{10} CONCENTRATIONS NILAND MARCH 30, 2017

	BORREGO SPRINGS (BRGSD)			OCOTILLO WELLS (AS938)			SALTON CITY		NAVAL TEST BASE		NILAND		
HOUR	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/D	W/S	W/D	W/S	W/D	PM_{10}
000	3	6	302	8	15	322	5	310	12	286	9	128	10
100	1	3	273	5	9	315	6	272	10	286	7	124	11
200	1	3	355	8	11	338	6	274	9	309	5	102	15
300	2	5	318	8	13	315	5	90	7	321	5	127	20
400	4	5	295	6	10	329	4	183	6	302	8	117	21
500	3	5	327	8	12	352	3	220	2	276	4	101	34
600	2	5	92	10	20	18	3	356	4	305	4	111	64
700	3	5	237	0	15		4	299	5	274	4	150	55
800	2	6	43	0	0		4	13	6	340	7	142	27
900	12	17	307	14	25	324	4	84	5	35	5	170	34
1000	22	31	244	13	23	324	5	88	5	57	8	183	49
1100	16	23	271	10	25	299	10	107	14	290	8	220	31
1200	14	23	208	15	33	358	14	294	22	282	15	254	22
1300	16	29	289	18	45	63	26	246	25	279	24	265	150
1400	19	36	294	21	49	32	29	241	29	262	29	257	436
1500	26	44	292	11	28	306	26	251	31	252	29	248	534
1600	32	54	275	23	41	45	34	264	25	255	38	254	995
1700	31	50	274	20	37	330	30	271	22	294	37	251	995
1800	31	49	270	20	33	45	31	275	31	315	28	251	995
1900	20	37	301	27	43	35	36	256	33	288	23	247	516
2000	25	38	300	24	40	302	19	291	30	279	17	292	79
2100	22	33	298	21	38	307	11	293	25	299	25	312	189
2200	13	20	307	18	28	323	22	320	24	271	24	310	109
2300	14	23	328	18	30	327	20	317	22	276	22	306	69

Wind data for KNJK from the NCEI's QCLCD system. Wind data for TNSC1 and IMPSD from the University of Utah's MesoWest system. Wind data for El Centro from the EPA's AQS Repository. Wind speeds = mph; Direction = degrees. Due to the different times that wind data and air quality data is sampled at various sites, the hour given represents the hour in which the measurement was taken

TABLE 3-5
WIND SPEEDS AND PM_{10} CONCENTRATIONS EL CENTRO MARCH 30, 2017

MOUNTAIN SPRINGS GRADE (TNSC1)				SUNRISE-OCOTILLO (IMPSD)				EL CENTRO NAF (KNJK)					EL CENTRO			
HR	W/S	W/G	W/D	HR	W/S	W/G	W/D	HR	W/S	W/G	W/D	Obs.	HR	W/S	W/D	PM_{10}
050	21	33	209	000	8	13	241	056	9		250		000	4	249	16
150	21	34	221	100	6	12	280	156	11		230		100	3	241	17
250	25	35	213	200	5	7	283	256	5		240		200	2	236	8
350	26	37	207	300	4	8	270	356	8		270		300	2	159	20
450	25	37	211	400	6	10	266	456	10		170		400	1	128	64
550	26	36	203	500	8	14	253	556	3		170		500	2	157	63
650	26	37	203	600	11	23	254	656	5		190		600	1	135	96
750	23	36	210	700	15	22	227	756	7		280		700	3	145	95
850	27	39	219	800	13	20	252	856	0		0		800	2	136	81
950	21	39	238	900	16	26	249	956	14		260		900	2	257	59
1050	25	38	211	1000	11	23	260	1056	8		230		1000	9	247	26
1150	22	36	222	1100	10	19	207	1156	21	30	270		1100	10	242	17
1250	**23**	**37**	240	**1200**	**14**	**28**	262	**1256**	**34**	**40**	250		**1200**	**14**	261	**114**
1350	23	39	237	1300	13	25	267	1356	30	36	240		1300	15	252	76
1450	**24**	**45**	223	**1400**	**19**	**32**	273	**1456**	**33**	**45**	240		**1400**	**16**	248	**148**
1550	**33**	**53**	232	**1500**	**15**	**33**	276	**1556**	**25**	**32**	240		**1500**	**17**	246	**259**
1650	**29**	**56**	222	**1600**	**11**	**23**	281	**1656**	**32**	**40**	250		**1600**	**15**	244	**181**
1750	**36**	**58**	235	**1700**	**26**	**45**	252	**1756**	**23**	**31**	260		**1700**	**19**	247	**416**
1850	**34**	**58**	221	**1830**	**30**	**48**	249	**1847**	**22**		300	**DU**	**1800**	**18**	253	**126**
1950	**33**	**59**	219	**1920**	**25**	**48**	253	**1939**	**17**		290	**DU**	**1900**	**10**	287	**995**
2050	**26**	**64**	236	**2000**	**9**	**16**	274	**2056**	**24**	**33**	310	**DU**	**2000**	**7**	283	**552**
2150	**23**	**41**	238	**2100**	**16**	**28**	251	**2156**	**20**	**32**	310	**DU**	**2100**	**14**	280	**360**
2250	**13**	**32**	242	**2200**	**20**	**37**	272	**2256**	**29**	**38**	310	**DU**	**2200**	**15**	287	**688**
2350	**18**	**33**	244	**2300**	**13**	**22**	260	**2356**	**23**	**33**	300	**DU**	**2300**	**16**	287	**227**

Wind data for KNJK, from the NCEI's QCLCD system. Wind data for TNSC1 and FHCC1 from the University of Utah's MesoWest system. Wind data for Westmorland from the EPA's AQS Repository. Wind speeds = mph; Direction = degrees. Due to the different times that wind data and air quality data is sampled at various sites, the hour given represents the hour in which the measurement was taken

TABLE 3-6
ICAPCD WIND SPEEDS AND PM_{10} CONCENTRATIONS CALEXICO MARCH 30, 2017

MOUNTAIN SPRINGS GRADE (TNSC1)				SUNRISE-OCOTILLO (IMPSD)				EL CENTRO NAF (KNJK)					CALEXICO			
HR	W/S	W/G	W/D	HR	W/S	W/G	W/D	HR	W/S	W/G	W/D	Obs.	HR	W/S	W/D	PM_{10}
050	21	33	209	000	8	13	241	056	9		250		000	0	125	120
150	21	34	221	100	6	12	280	156	11		230		100	1	326	101
250	25	35	213	200	5	7	283	256	5		240		200	1	42	97
350	26	37	207	300	4	8	270	356	8		270		300	2	98	65
450	25	37	211	400	6	10	266	456	10		170		400	2	131	44
550	26	36	203	500	8	14	253	556	3		170		500	1	126	66
650	26	37	203	600	11	23	254	656	5		190		600	1	102	106
750	23	36	210	700	15	22	227	756	7		280		700	2	125	163
850	27	39	219	800	13	20	252	856	0		0		800	3	112	110
950	21	39	238	900	16	26	249	956	14		260		900	1	224	72
1050	25	38	211	1000	11	23	260	1056	8		230		1000	2	252	58
1150	22	36	222	1100	10	19	207	1156	21	30	270		1100	5	176	50
1250	23	37	240	1200	14	28	262	1256	34	40	250		1200	6	203	30
1350	23	39	237	1300	13	25	267	1356	30	36	240		1300	13	260	203
1450	24	45	223	1400	19	32	273	1456	33	45	240		1400	13	251	154
1550	33	53	232	1500	15	33	276	1556	25	32	240		1500	14	263	201
1650	29	56	222	1600	11	23	281	1656	32	40	250		1600	15	275	178
1750	36	58	235	1700	26	45	252	1756	23	31	260		1700	14	262	498
1850	34	58	221	1830	30	48	249	1847	22		300	DU	1800	17	269	515
1950	33	59	219	1920	25	48	253	1939	17		290	DU	1900	19	289	630
2050	26	64	236	2000	9	16	274	2056	24	33	310	DU	2000	14	290	180
2150	23	41	238	2100	16	28	251	2156	20	32	310	DU	2100	15	272	203
2250	13	32	242	2200	20	37	272	2256	29	38	310	DU	2200	16	279	70
2350	18	33	244	2300	13	22	260	2356	23	33	300	DU	2300	12	268	105

Wind data for Borrego Springs, Ocotillo Wells from the University of Utah's MesoWest system. Wind data from Naval Test Base and Salton City from AQMIS2. Wind data for Niland from the EPA's AQS Repository. Wind speeds = mph; Direction = degrees. Due to the different times that wind data and air quality data is sampled at various sites, the hour given represents the hour in which the measurement was taken

As mentioned above Urgent Weather Messages containing either High Wind Watch, a High Wind Warning, a Wind Advisory, or a Blowing Dust Advisory described the strong westerly gusty winds forecast for southeastern California, including the whole of Imperial County, along with portions of southwestern Arizona. The high winds were responsible for the blowing dust that affected different regional air monitors in Riverside County, Imperial County and Arizona (**Table 2-1**).

The ICAPCD monitors air quality for each of its stations and issues web-based Air Quality Indices in response to changes in air quality.[8] As transported windblown dust entered Imperial County, air quality for the Imperial Valley quickly degraded through the afternoon and evening of March 30, 2017. The dust laden winds caused the AQI to drop to a hazardous level by 900 pm PST.

FIGURE 3-3
IMPERIAL VALLEY AIR QUALITY INDEX FOR BRAWLEY
MARCH 30, 2017

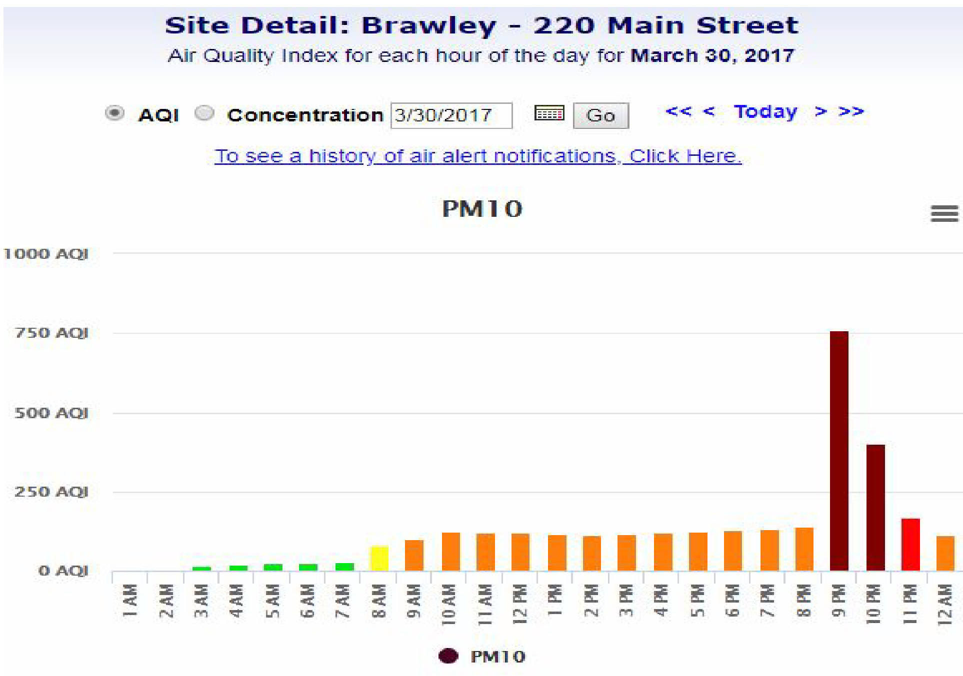


Fig 3-3: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Green" or Good level to a "Maroon" or Hazardous level

[8] 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 affects 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 3-4
IMPERIAL VALLEY AIR QUALITY INDEX FOR CALEXICO
MARCH 30, 2017

Fig 3-4: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Yellow" or Moderate level to an "Orange" or Unhealthy for Sensitive Groups level

FIGURE 3-5
IMPERIAL VALLEY AIR QUALITY INDEX FOR EL CENTRO
MARCH 30, 2017

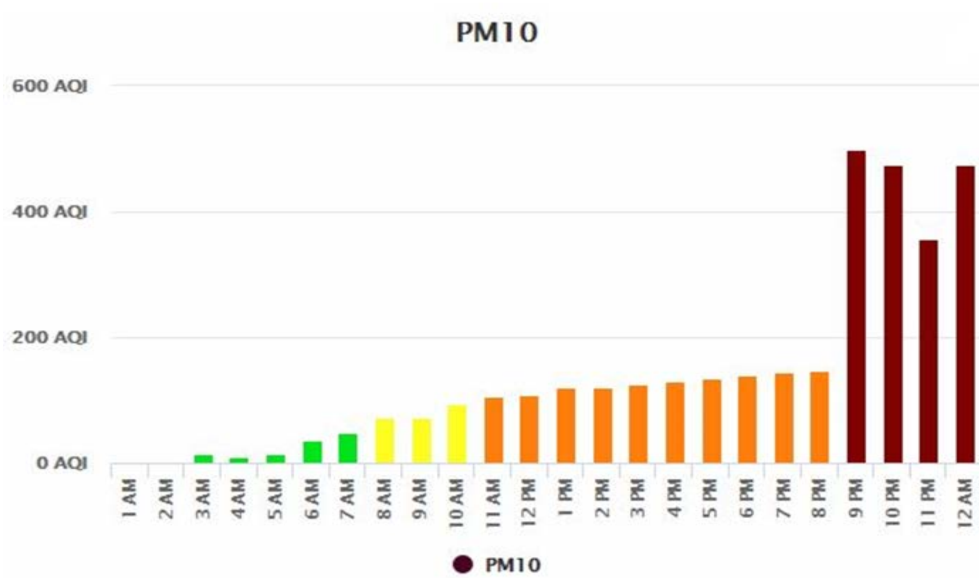


Fig 3-5: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Yellow" or Moderate level to an "Orange" or Unhealthy for Sensitive Groups level

FIGURE 3-6
IMPERIAL VALLEY AIR QUALITY INDEX FOR NILAND
MARCH 30, 2017

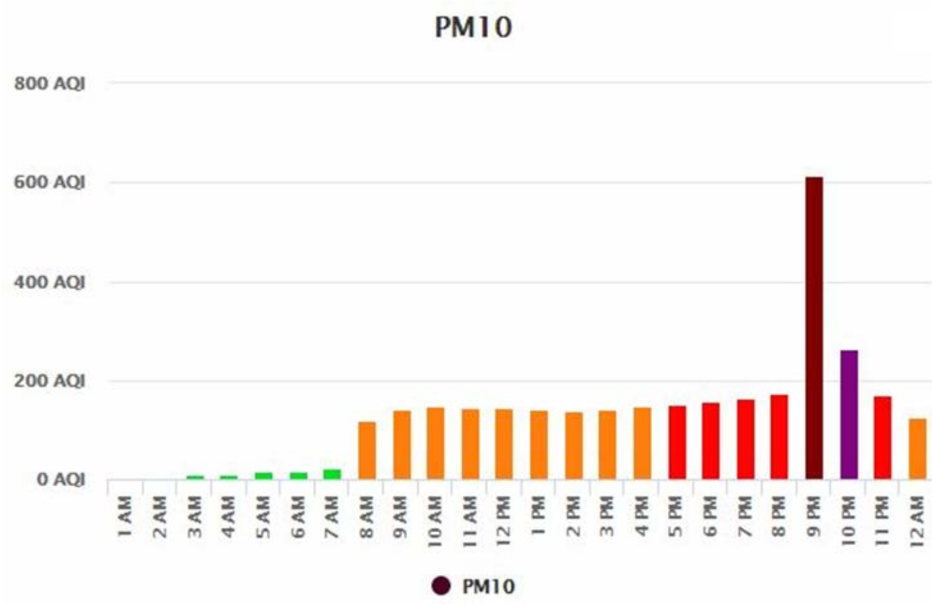


Fig 3-6: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Green" or Good level to a "Maroon" or Hazardous level

FIGURE 3-7
IMPERIAL VALLEY AIR QUALITY INDEX FOR WESTMORLAND
MARCH 30, 2017

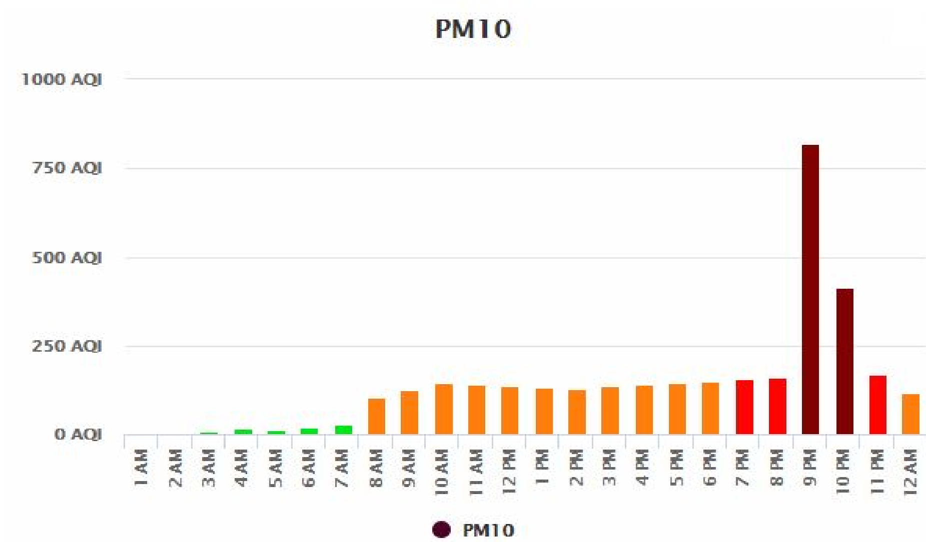


Fig 3-7: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Green" or Good level to a "Maroon" or Hazardous level

III.1 Summary of Forecasts and Warnings

As early as Monday, March 27, 2017 the NWS San Diego office issued an Area Forecast Discussion that identified a low-pressure system moving through the Great Basin with preceding westerly winds. As the system moved inland, the San Diego NWS office issued 5 Urgent Weather Messages indicating strong gusty westerly winds and blowing dust and sand for several areas within its service region including Coachella and Borrego Springs. By March 29, 2017 at 539 pm MST the Phoenix NWS office issued a Wind Advisory for all of Imperial County, along with areas in eastern Riverside County and portions of southwestern Arizona. By March 30, 2017 the NWS office in San Diego upgraded the High Wind Watch to a High Wind Warning and warned not only of very strong winds over the San Diego deserts (and elsewhere) but also of the possibility for significant blowing dust. Finally, at 1016 am MST a Blowing Dust Advisory was issued for Imperial County, eastern Riverside County, and Yuma and La Paz counties in Arizona. The Weather Story issued by the San Diego NWS office for March 30, 2017 summed up the forecast, "Severe Mountain/Desert Winds" to possibly cause damage, severely reduce visibility due to blowing dust and sand and create hazardous driving conditions for high-profile vehicles. (**Appendix C**).

III.2 Summary of Wind Observations

As demonstrated above wind data during the event were available from airports in eastern Riverside County, southeastern San Diego County, southwestern Yuma County (Arizona), northern Mexico, and Imperial County as well as from other automated meteorological instruments upstream from the ICAPCD monitors. Multiple sites, from the desert slopes to the desert floor, measured winds at or above 25 mph, with some sites measuring gusts exceeding 50 mph.

IV Concentration to Concentration Analysis – An analyses comparing the event-influenced concentrations to concentrations at the same monitoring site at other times

While naturally occurring high wind events may recur seasonally and at times frequently and qualify for exclusion under the EER, historical comparisons of the particulate concentrations and associated winds provide insight into the frequency of events within an identified area.

Figures 4-1 through 4-10 show the time series of available FRM and BAM 24-hr PM_{10} concentrations measured at Brawley, Calexico, El Centro, Niland, and Westmorland monitors for the period of January 1, 2010 through March 30, 2017. The compiled data set below includes non-regulatory data prior to 2013. As a consequence, continuous monitoring data (hourly concentrations) prior to 2013 were not reported into the US EPA Air Quality System (AQS).[9] The difference between the standard and local condition concentrations is not significant enough to change the outcome of the analysis.

Compiled and plotted 24-hour averaged PM_{10} concentrations, between January 1, 2010 and March 30, 2017, as measured by the each air quality monitor, was used to establish the historical and seasonal variability over time.[10] All figures illustrate that the exceedance, which occurred on March 30, 2017, were outside the normal historical concentrations when compared to event and non-event days. Air quality data for all graphs obtained through the EPA's AQS data bank.

[9] Pollutant concentration data contained in EPA's Air Quality System (AQS) are required to be reported in units corrected to standard temperature and pressure (25 C, 760 mm Hg). Because the PM_{10} concentrations prior to 2013 were not reported into the AQS database all BAM (FEM) data prior to 2013 within this report are expressed as micrograms per cubic meter (mg/m^3) at local temperature and pressure (LTP) as opposed to standard temperature and pressure (STP, 760 torr and 25 C). The difference in concentration measurements between standard conditions and local conditions is insignificant and does not alter or cause any significant changes in conclusions to comparisons of PM_{10} concentrations to PM_{10} concentrations with in this demonstration.

[10] FRM sampling ended December 2016.

FIGURE 4-1
BRAWLEY HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MARCH 30, 2017

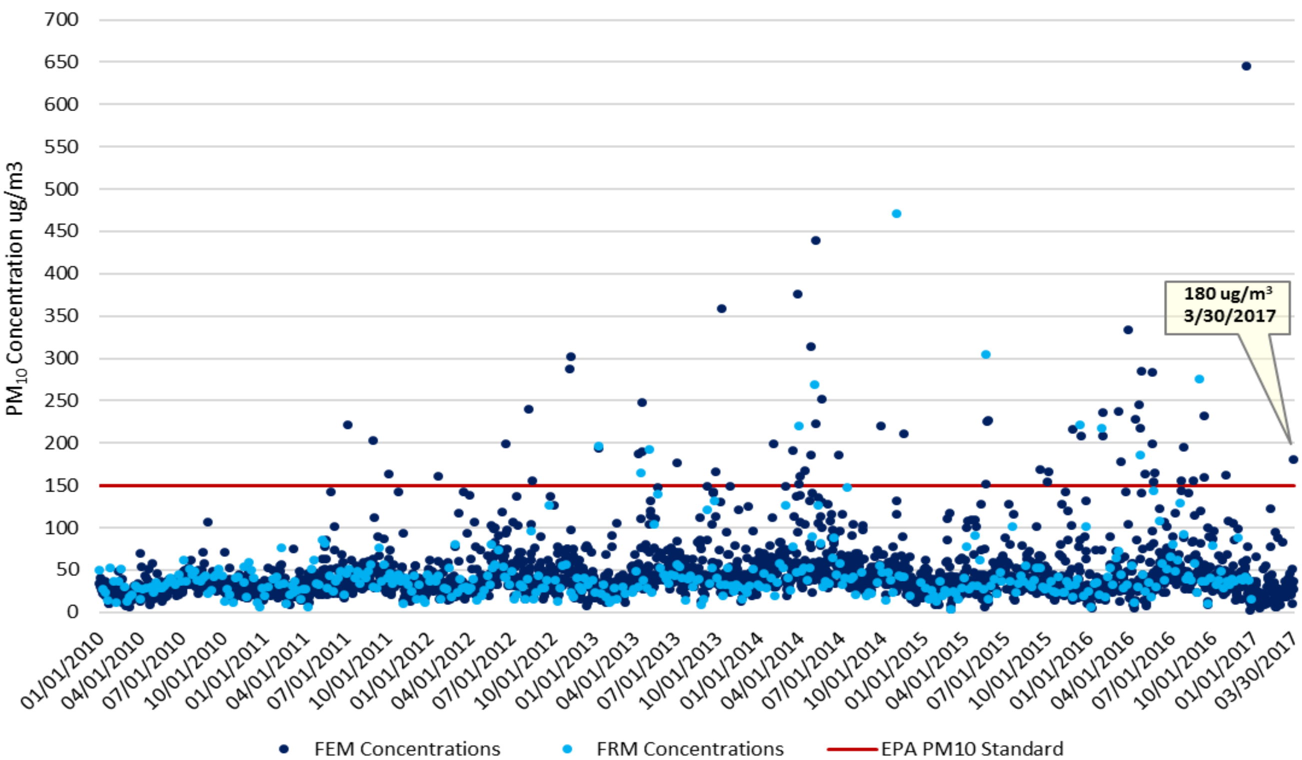


Fig 4-1: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 180 µg/m³ on March 30, 2017 by the Brawley monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-1** for Brawley included 2,646 sampling days (January 1, 2010 through March 30, 2017). Of the 2,646 sampling days the Brawley monitor measured 60 exceedance days which translates into an occurrence rate less than 2%. Historically, there were twelve (12) exceedance days measured during the first quarter, twenty-four (24) exceedance days measured during the second quarter, thirteen (13) exceedance days measured during the third quarter, and eleven (11) exceedance days measured during the fourth quarter.

FIGURE 4-2
CALEXICO HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MARCH 30, 2017

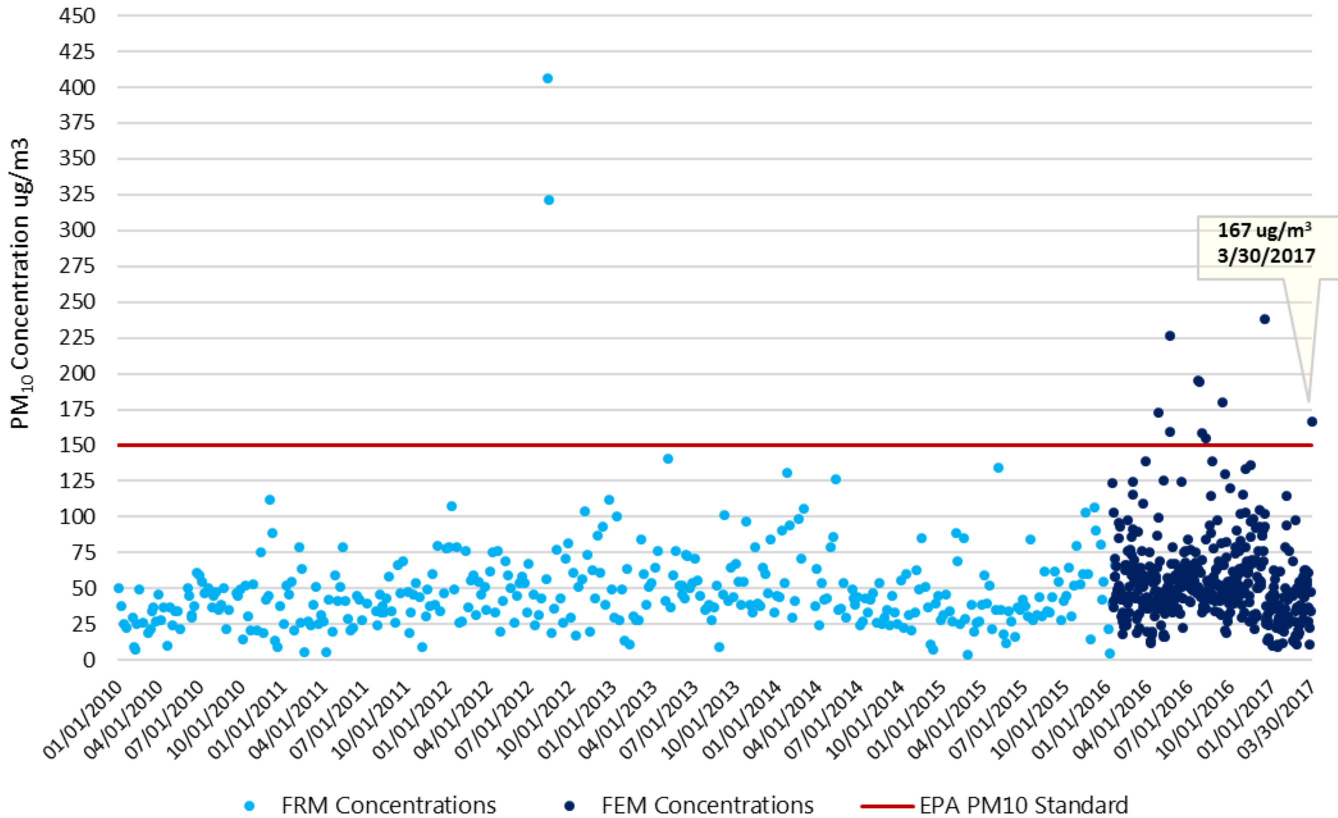


Fig 4-2: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 167 µg/m³ on March 30, 2017 by the Calexico monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-2** for Calexico included 892 sampling days (January 1, 2010 through March 30, 2017). Of the 892 sampling days the Calexico monitor measured 13 exceedance days which translates into an occurrence rate less than 2%. Historically, there was a single (1) exceedance day measured during the first quarter, thirteen (13) exceedance days measured during the second quarter, four (4) exceedance days measured during the third quarter, and seven (7) exceedance days measured during the fourth quarter.

FIGURE 4-3
EL CENTRO HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MARCH 30, 2017

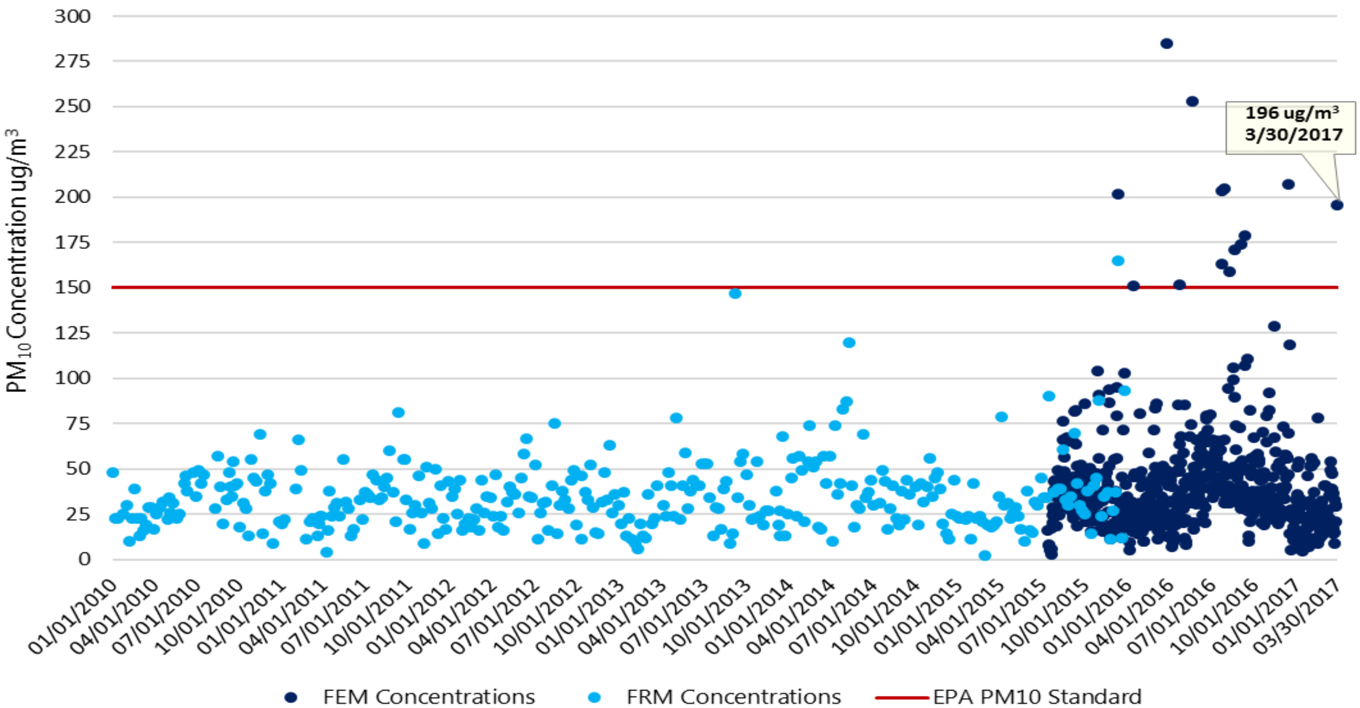


Fig 4-3: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 196 µg/m^3 on March 30, 2017 by the El Centro monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-3** for El Centro included 983 sampling days (January 1, 2010 through March 30, 2017). Of the 983 sampling days the El Centro monitor measured 12 exceedance days which translates into an occurrence rate less than 2%. Historically, there were two (2) exceedance days measured during the first quarter, twelve (12) exceedance days measured during the second quarter, seven (7) exceedance days measured during the third quarter, and two (2) exceedance days measured during the fourth quarter.

FIGURE 4-4
NILAND HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MARCH 30, 2017

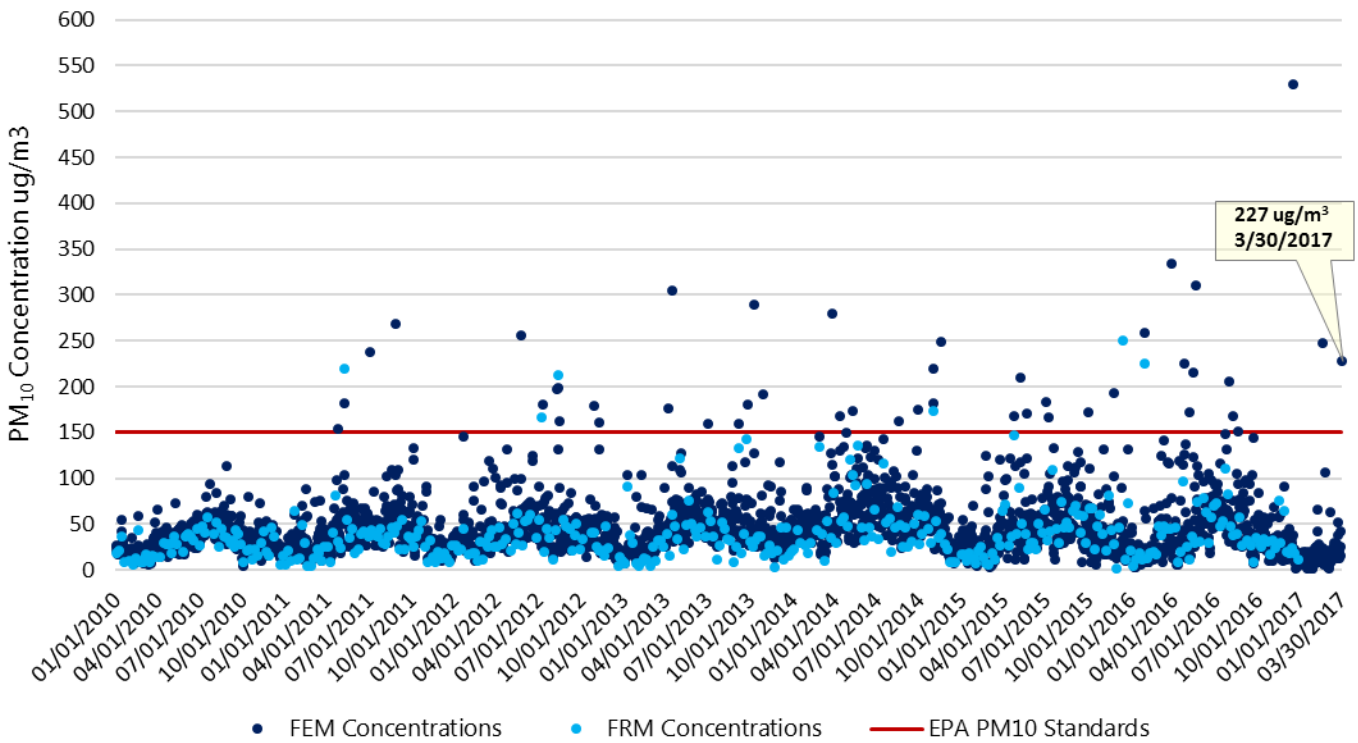


Fig 4-4: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 227 μg/m³ on March 30, 2017 by the Niland monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-4** for Niland included 2,646 sampling days (January 1, 2010 through March 30, 2017). Of the 2,646 sampling days the Niland monitor measured 48 exceedance days which translates into an occurrence rate less than 2%. Historically, there were five (5) exceedance days measured during the first quarter, seventeen (17) exceedance days measured during the second quarter, fifteen (15) exceedance days measured during the third quarter, and eleven (11) exceedance days measured during the fourth quarter.

FIGURE 4-5
WESTMORLAND HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MARCH 30, 2017

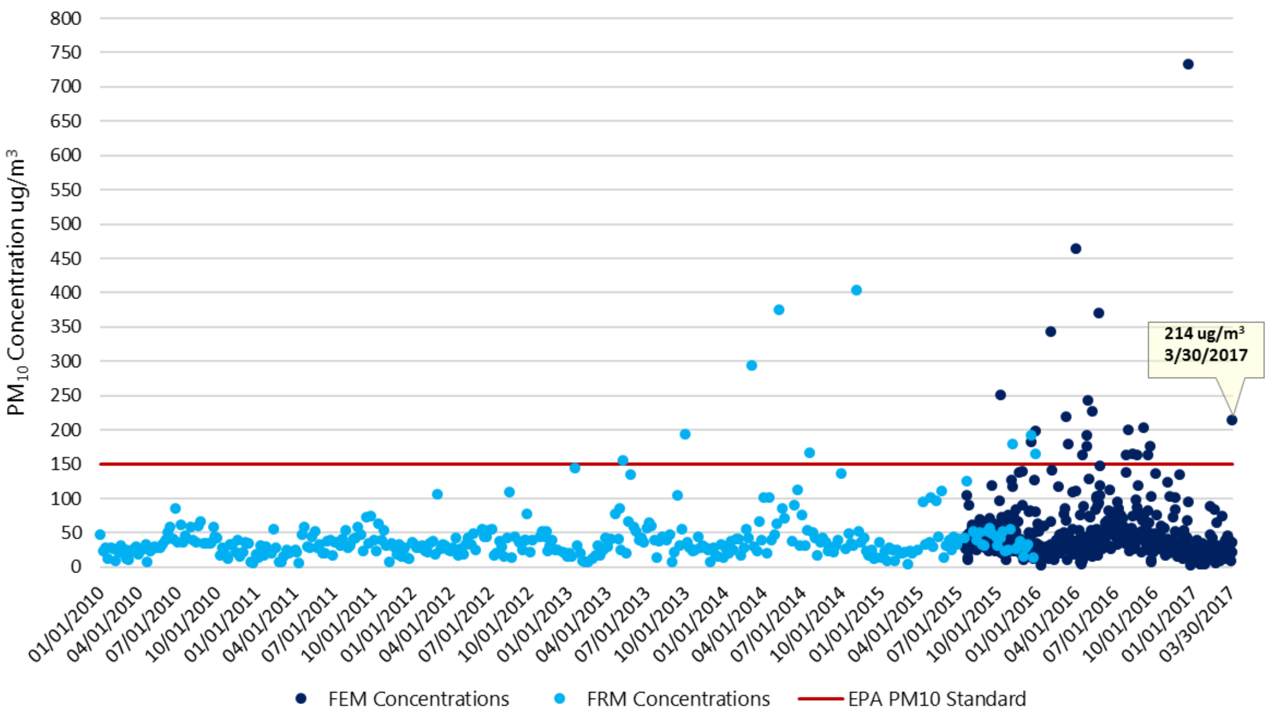
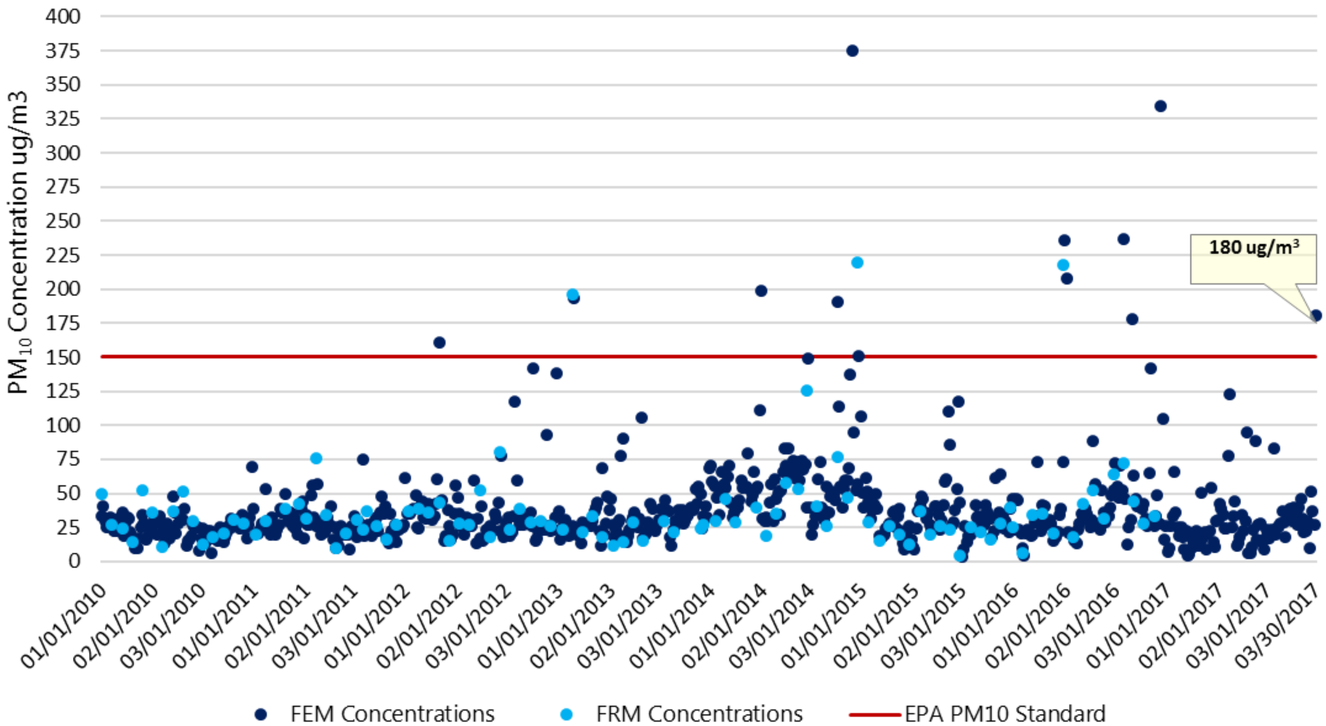


Fig 4-5: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 214 µg/m³ on March 30, 2017 by the Westmorland monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-5** for Westmorland included 974 sampling days (January 1, 2010 through March 30, 2017). Of the 974 sampling days the Westmorland monitor measured 29 exceedance days which translates into an occurrence rate less than 3%. Historically, there were six (6) exceedance days measured during the first quarter, eight (8) exceedance days measured during the second quarter, nine (9) exceedance days measured during the third quarter, and six (6) exceedance days measured during the fourth quarter.

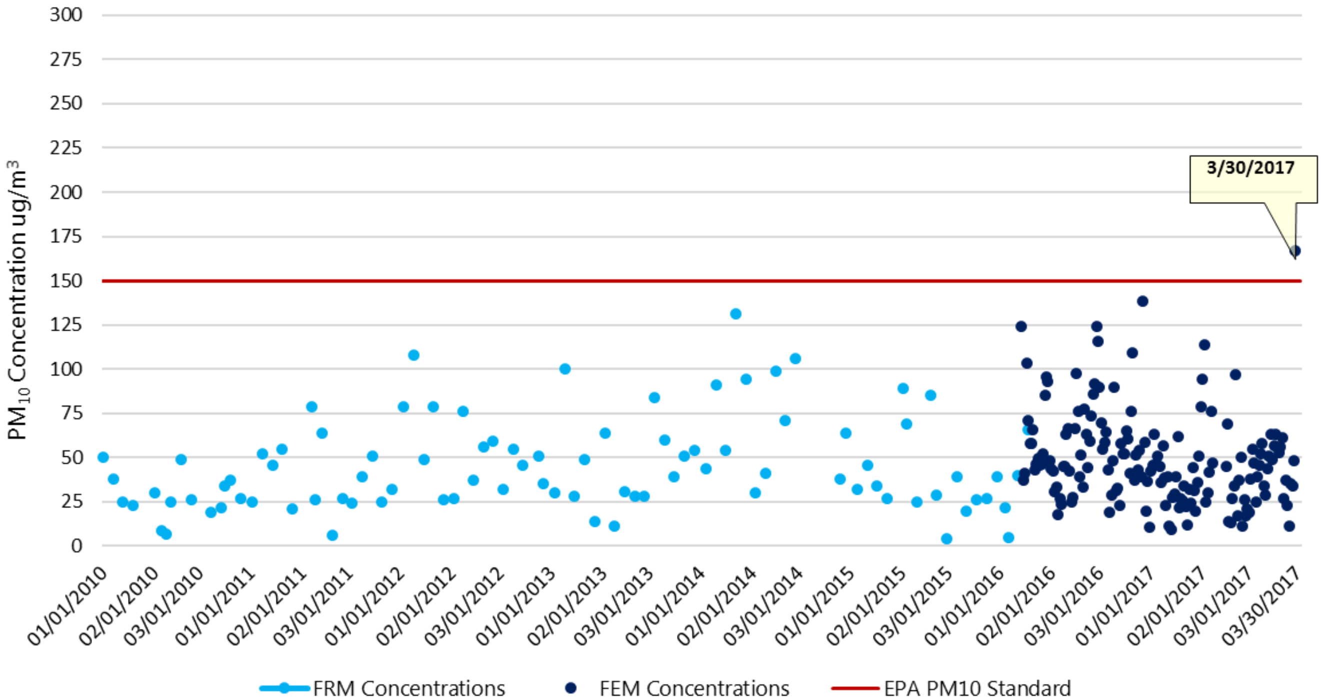
FIGURE 4-6
BRAWLEY SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***JANUARY 1, 2010 TO MARCH 30, 2017**



***Quarterly: January 1, 2010 to March 31, 2016 and January 1, 2017 to March 30, 2017**
Fig 4-6: A comparison of PM_{10} seasonal concentrations demonstrate that the measured concentration of 180 μg/m^3 by the Brawley monitor on March 30, 2017 was outside the normal seasonal concentrations when compared to similar event days and non-event days

Figure 4-6 illustrates the seasonal fluctuations over a period of 721 sampling days, 823 credible samples and twelve (12) exceedance days. This translates to less than a 2% seasonal exceedance occurrence rate.

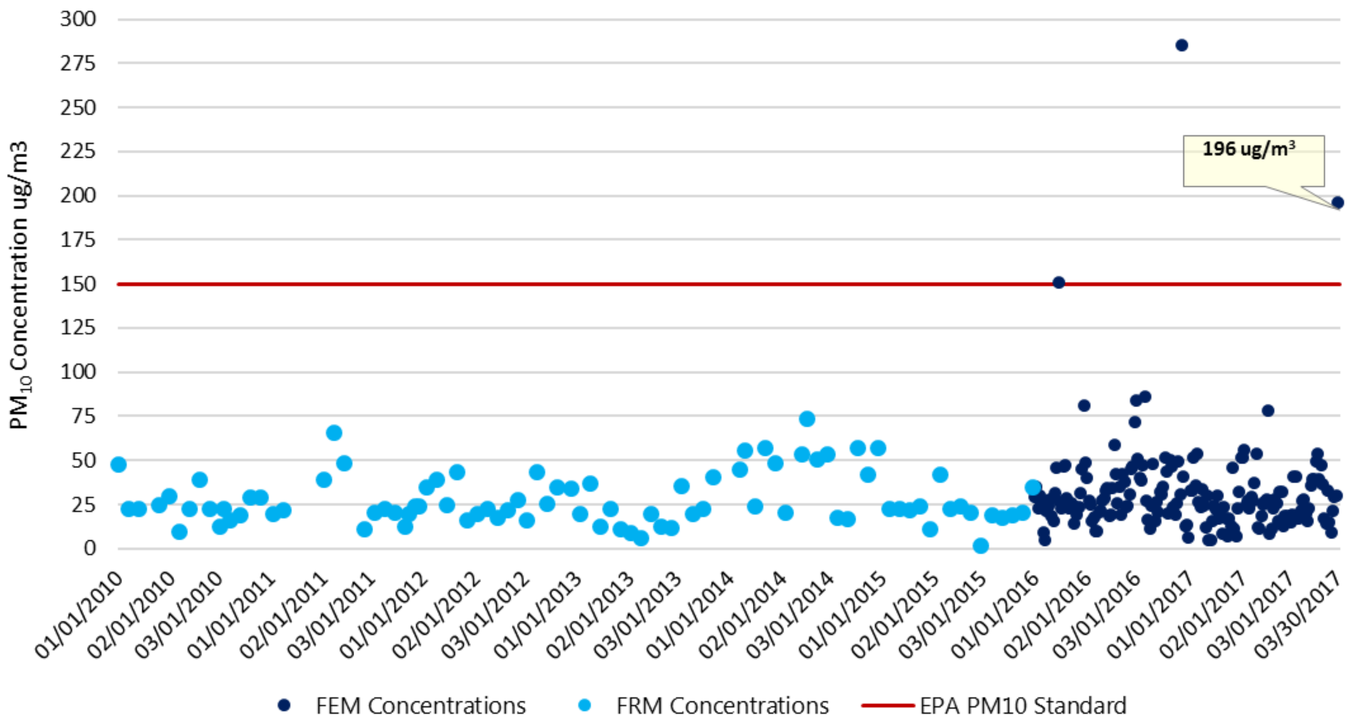
FIGURE 4-7
CALEXICO SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***JANUARY 1, 2010 TO MARCH 30, 2017**



***Quarterly: January 1, 2010 to March 31, 2016 and January 1, 2017 to March 30, 2017**
Fig 4-7: A comparison of PM_{10} seasonal concentrations demonstrate that the measured concentration of 167 µg/m^3 by the Calexico monitor on March 30, 2017 was outside the normal seasonal concentrations when compared to similar event days and non-event days

Figure 4-7 illustrates the seasonal fluctuations over a period of 268 sampling days, 249 credible samples and one (1) exceedance day. This translates to less than a 0.5% seasonal exceedance occurrence rate.

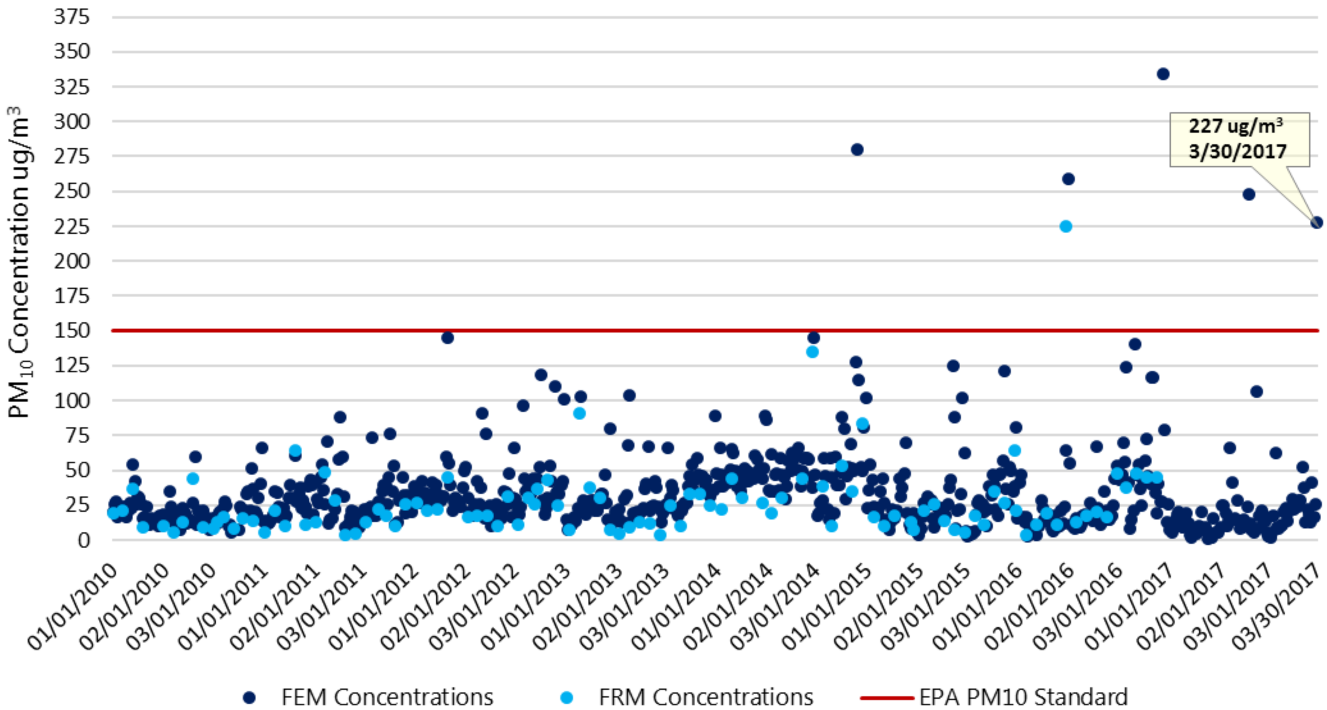
FIGURE 4-8
EL CENTRO SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***JANUARY 1, 2010 TO MARCH 30, 2017**



***Quarterly: January 1, 2010 to March 31, 2016 and January 1, 2017 to March 30, 2017**
Fig 4-8: A comparison of PM_{10} seasonal concentrations demonstrate that the measured concentration of 196 µg/m³ by the El Centro monitor on March 30, 2017 was outside the normal seasonal concentrations when compared to similar event days and non-event days

Figure 4-8 illustrates the seasonal fluctuations over a period of 277 sampling days, 364 credible samples and two (2) exceedance days. This translates to less than a 0.5% seasonal exceedance occurrence rate.

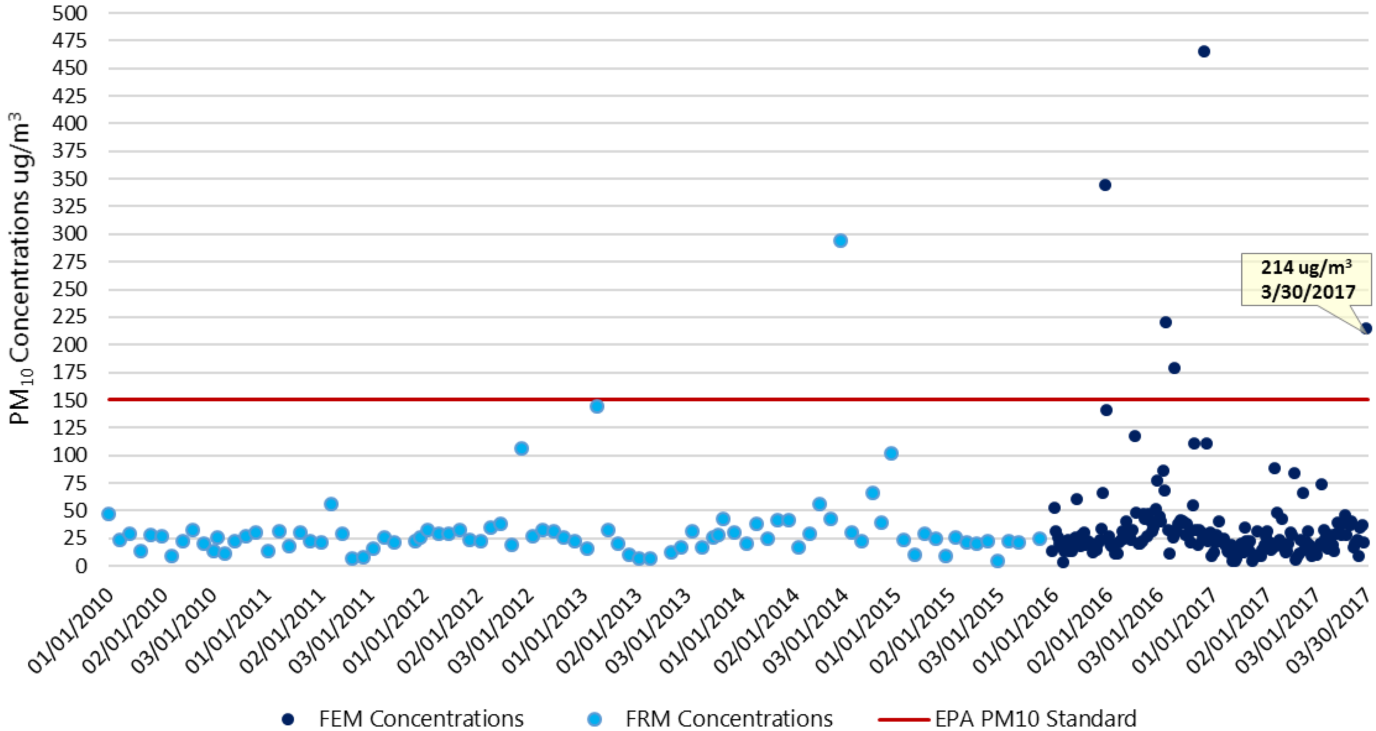
FIGURE 4-9
NILAND SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***JANUARY 1, 2010 TO MARCH 30, 2017**



***Quarterly: January 1, 2010 to March 31, 2016 and January 1, 2017 to March 30, 2017**
Fig 4-9: A comparison of PM_{10} seasonal concentrations demonstrate that the measured concentration of 227 µg/m³ by the Niland monitor on March 30, 2017 was outside the normal seasonal concentrations when compared to similar event days and non-event days

Figure 4-9 illustrates the seasonal fluctuations over a period of 721 sampling days, 821 credible samples and five (5) exceedance days. This translates to less than a 0.6% seasonal exceedance occurrence rate.

FIGURE 4-10
WESTMORLAND SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***JANUARY 1, 2010 TO MARCH 30, 2017**



***Quarterly: January 1, 2010 to March 31, 2016 and January 1, 2017 to March 30, 2017**
Fig 4-10: A comparison of PM_{10} seasonal concentrations demonstrate that the measured concentrations of 214 µg/m³ by the Westmorland monitor on March 30, 2017 were outside the normal seasonal concentrations when compared to similar days and non-event days.

Figure 4-10 illustrates the seasonal fluctuations over a period of 273sampling days, 269 credible samples and six (6) exceedance days. This translates to less than a 2.5% seasonal exceedance occurrence rate.

Examining the historical and seasonal time series concentrations as they relate to the March 30, 2017 measured exceedance, the exceedance measured on March 30, 2017 is clearly outside the normal concentration levels when comparing to similar event days and non-event days.

V Both Not Reasonably Controllable and Not Reasonably Preventable – A demonstration that the event was both not reasonably controllable and not reasonably preventable

The analysis above, under the Clear Causal Relationship, indicates that the primary sources affecting air quality in Imperial County originated from as far as areas within the San Diego Mountains and the desert slopes. These emissions blew into Imperial County over the desert floor within the western portion of Imperial County, over farmland and urbanized centers. Since Imperial County does not have jurisdiction over emissions emanating from the San Diego Mountains, it is not reasonably controllable or preventable by Imperial County. However, as discussed below, anthropogenic areas within Imperial County were reasonably controlled.

As mentioned above in section I.4, Mitigation of Exceptional Events contains significant information regarding the application of Best Available Control Measures that are used as measures to abate or minimize contributing controllable sources of identified pollutants (**Page 12, sub-section II.2 of the High Wind Mitigation Plan**). In addition, the mitigation plan explains the methods utilized to minimize public exposure to high concentrations of identified pollutants, the process utilized to collect and maintain data pertinent to any identified event, and the mechanisms utilized to consult with other air quality managers within the affected area regarding the appropriate responses to abate and minimize affects.

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. The October 16, 2012 adopted revision reflects the specific revisions to Regulation VIII, which USEPA approved on April 22, 2013. Since 2006, ICAPCD had implemented regulatory measures to control emissions from fugitive dust sources and open burning in Imperial County.

FIGURE 5-1
REGULATION VIII GRAPHIC TIMELINE DEVELOPMENT

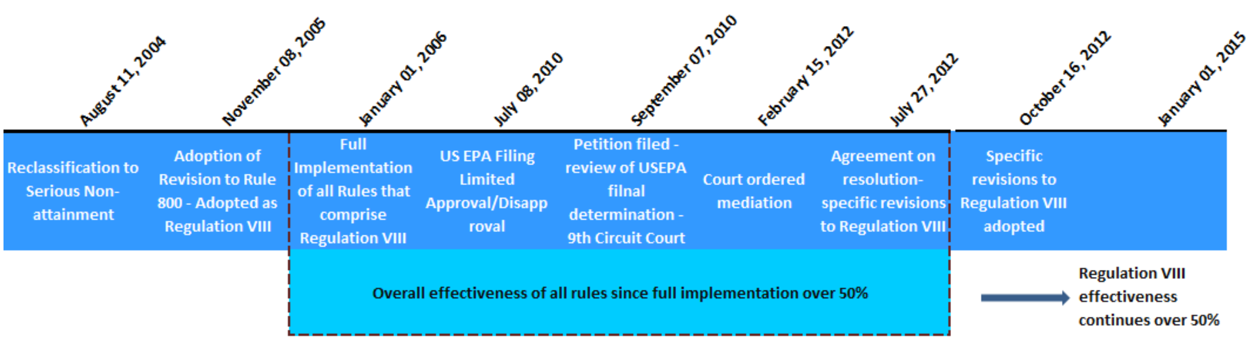


Fig 5-1: Regulation VIII Graphic Timeline

V.1 Wind Observations

As previously discussed, wind data analysis indicates that on March 30, 2017 multiple upstream sites measured wind speeds at or above 25 mph. Wind speeds of 25 mph are normally sufficient to overcome most PM_{10} control measures. During the March 30, 2017 event, wind speeds were above the 25 mph threshold, overcoming the BACM in place.

V.2 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 the air quality monitors during the March 30, 2017 PM_{10} exceedance. Both permitted and non-permitted sources are required to comply with Regulation VIII requirements that address fugitive dust emissions. The identified permitted sources are Aggregate Products, Inc., US Gypsum Quarry, Imperial Aggregates (Val-Rock, Inc., and Granite Construction), US Gypsum Plaster City, Clean Harbors (Laidlaw Environmental Services), Bullfrog Farms (Dairy), Burrtec Waste Industries, Border Patrol Inspection station, Centinela State Prison, various communications towers not listed and various agricultural operations. Non-permitted sources include the wind farm known as Ocotillo Express, and a solar facility known as CSolar IV West. Finally, the desert regions are under the jurisdiction of the Bureau of Land Management and the California Department of Parks (Including Anza Borrego State Park and Ocotillo Wells).

An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM_{10} emissions. There were no complaints filed on March 30, 2017, officially declared as a No Burn Day, related to agricultural burning, waste burning or dust.

FIGURE 5-2
PERMITTED SOURCES

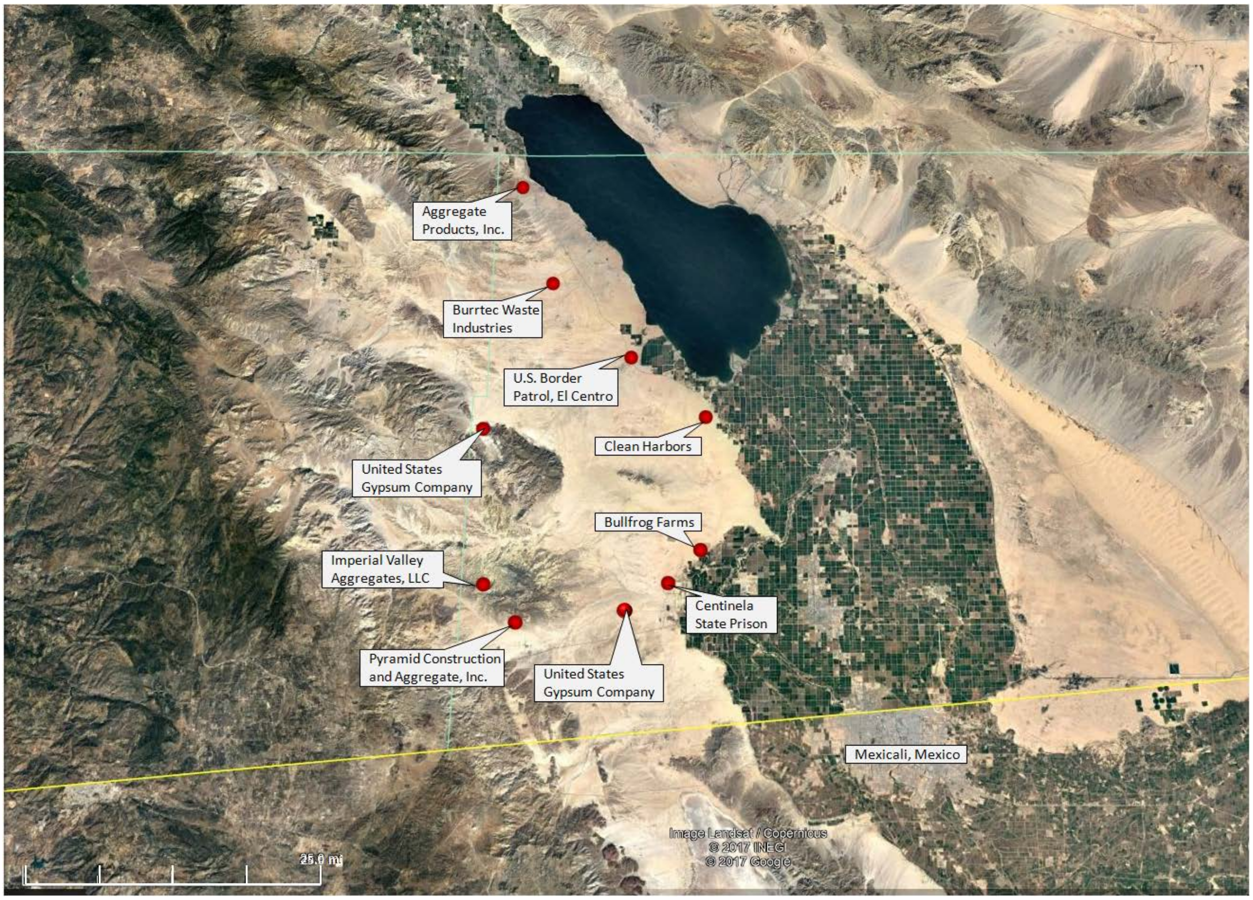


Fig 5-2: The above map identifies those permitted sources located west, northwest and southwest of the air quality monitors in Imperial County. The green line to the north denotes the political division between Imperial and Riverside counties. The yellow line below denotes the international border between the United States and Mexico. The green checker-boarded areas are a mixed use of agricultural and community parcels. In addition, either the Bureau of Land Management or the California Department of Parks manages the desert areas. Base map from Google Earth

FIGURE 5-3
NON-PERMITTED SOURCES

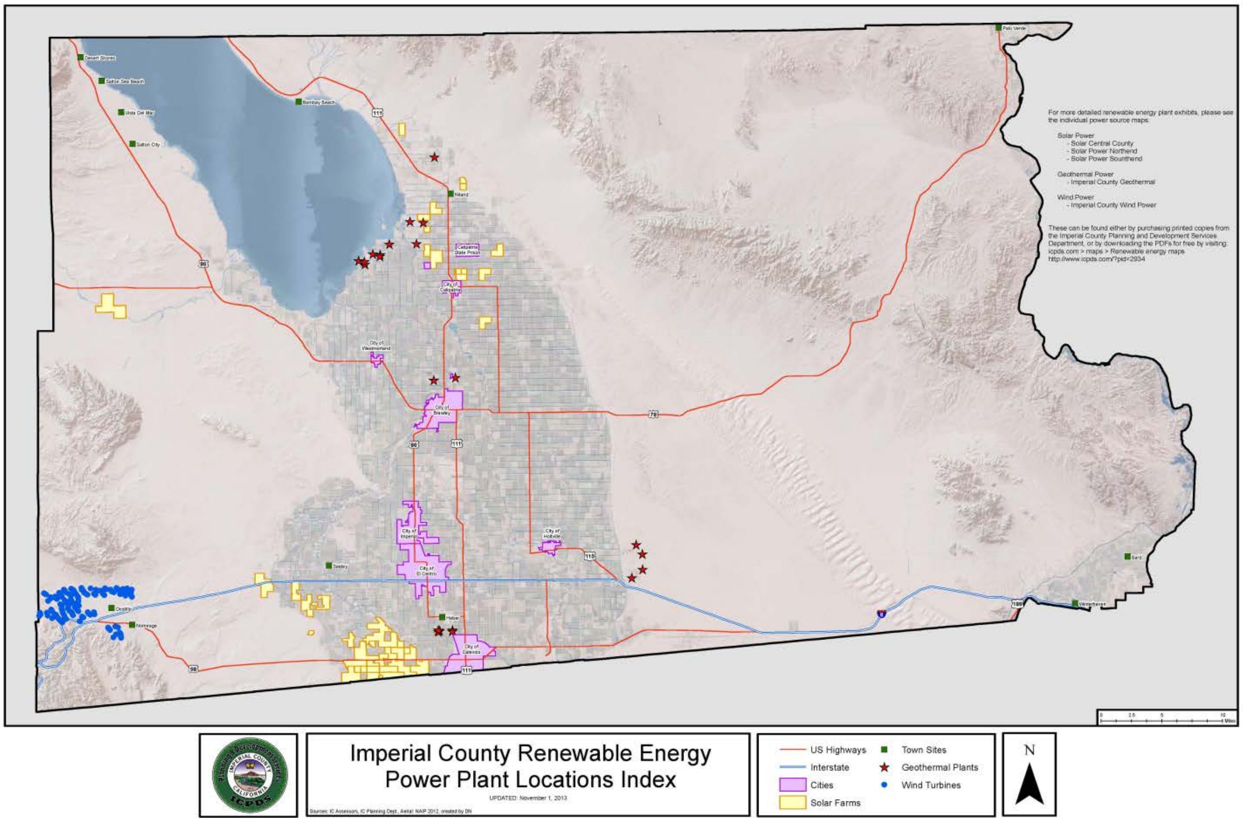


Fig 5-3: The above map identifies those power sources located west, northwest and southwest of the air quality monitors in Imperial County. Blue indicate the Wind Turbines, Yellow are the solar farms and stars are geothermal plants

VI A Natural Event – A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event.

Typically, low pressure systems during this time of the year will bring westerly winds when strong pressure gradients ramped up causing strong gradient winds. The March 30, 2017 high wind event was a result of a stronger onshore flow pattern. As the deep upper trough moved into Northern California and across the Great Basin, pressure gradients ramped up Thursday, March 30, 2017 during the afternoon hours peaking during the evening. This created strong gusty westerly winds that blew across the mountains and desert slopes within San Diego County into Imperial County transporting windblown dust which affected air quality and caused an exceedance at all the air quality monitors in Imperial County. This event affected all of the western coast into Arizona.

VI.1 Affects Air Quality

The preamble to the revised EER states that an event is considered to have affected air quality if it can be demonstrated that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation. Given the information presented in this demonstration, particularly Section III, we can reasonably conclude that there exists a clear causal relationship between the monitored exceedance and the March 30, 2017 event, which changed or affected air quality in Imperial County.

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." The revised preamble explains that the nRCP has two prongs, not reasonably preventable and not reasonably controllable. The nRCP is met for natural events where high wind events entrain dust from desert areas, whose sources are controlled by BACM, where human activity played little or no direct causal role. This demonstration provides evidence that the primary source areas of windblown dust transported into Imperial County came from as far as the mountains and desert slopes within San Diego County where Imperial County has no jurisdiction. In any event, despite BACM in place within Imperial County, high winds overwhelmed all BACM controls where human activity played little to no direct causal role. The PM_{10} exceedances measured at the Brawley, Calexico, El Centro, Niland, and Westmorland monitors were caused by naturally occurring strong gusty westerly winds that transported windblown dust into Imperial County and other parts of southern California from areas located within the Sonoran Desert regions to the west and southwest of Imperial County. These facts provide strong evidence that the PM_{10} exceedances at the Brawley, Calexico, El Centro, Niland, and Westmorland monitors on March 30, 2017, were not reasonably controllable or preventable.

VI.3 Natural Event

The revised preamble to the EER clarifies that a "Natural Event" (50.1(k) of 40 CFR Part 50) is an event with its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. Anthropogenic sources that are reasonably controlled are considered not to play a direct role in causing emissions. As discussed within this demonstration, the PM_{10} exceedance that occurred at the Brawley, Calexico, El Centro, Niland, and Westmorland monitors on March 30, 2017, were caused by the transport of windblown dust into Imperial County by strong westerly winds associated with a low-pressure system that passed through the region. At the time of the event, anthropogenic sources, within Imperial County were reasonably controlled with BACM. The event therefore qualifies as a natural event.

VI.4 Clear Causal Relationship

The comparative analysis of different meteorological sites to PM_{10} concentrations measured at the Brawley, Calexico, El Centro, Niland, and Westmorland monitors in Imperial County demonstrates a consistency of elevated gusty westerly winds with elevated concentrations of PM_{10} on March 30, 2017. In addition, temporal analysis indicates that the elevated PM_{10} concentrations and the gusty westerly winds were an event that was widespread, regional and not preventable. Days before the high wind event PM_{10} concentrations were well below the NAAQS. Overall, the demonstration provides evidence of the strong correlation between the natural event and the transported windblown dust to the exceedance on March 30, 2017.

VI.5 Concentration to Concentration Analysis

The historical annual and seasonal 24-hr average PM_{10} measured concentrations at the Brawley, Calexico, El Centro, Niland, and Westmorland monitors was outside the normal historical concentrations when compared to event and non-event days.

VI.6 Conclusion

The preceding discussion, graphs, figures, and tables provide wind direction, speed and concentration data illustrating the spatial and temporal effects of the strong gusty westerly winds caused by the steep pressure gradient associated with a low-pressure system over the Great Basin. The information provides a clear causal relationship between the entrained windblown dust and the PM_{10} exceedances measured at the Brawley, Calexico, El Centro, Niland, and Westmorland monitors on March 30, 2017.

In particular, the clear causal relationship and the not reasonably controllable or preventable sections provide evidence that high winds associated with the March 30, 2017 high wind dust event, generated emissions from mountains and natural open desert areas located as far as San Diego County (all part of the Sonoran Desert). In addition, during the March 30, 2017 event, anthropogenic sources within upwind areas were reasonably controlled at the time of the event, thus the March 30, 2017 event meets the definition of a Natural Event.[11]

[11] Title 40 Code of Federal Regulations part 50: §50.1(k) Natural event means an event and its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. For purposes of the definition of a natural event, anthropogenic sources that are reasonably controlled shall be considered to not play a direct role in causing emissions.