IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

[INSERT PIC]

October 20, 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 October 20, 2017

TABLE OF CONTENTS

SECTION PAGE

LIST OF FIGURES

FIGURE PAGE

LIST OF TABLES

TABLE PAGE

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 28
4	A demonstration that the event was both not reasonably controllable and not reasonably preventable	Pg 31
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 36

[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 Friday, October 20, 2017, which elevated particulate matter within San Diego, Riverside and Imperial 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 October 19, 2017 and October 20, 2017, the ICAPCD published advisories concerning the potential for elevated concentrations of particulate matter caused by gusty westerly winds preceding the passage of a trough of low-pressure by Friday, October 20, 2017. Along with the advisories the ICAPCD published wind advisories for all of Imperial County and an afternoon updated advisory on October 20, 2017 that included a Blowing Dust Advisory. Hazardous impacts were disclosed including lower visibility due to blowing dust. **Appendix C** contains copies of notices pertinent to the October 20, 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 October 20, 2017, a naturally occurring event elevated particulate matter within San Diego, Riverside and Imperial Counties, causing exceedances at the Brawley (06-025-0007), Calexico (06-025-0005), El Centro (06-025-1003), Niland monitor (06-025-4004), and Westmorland (06-025-4003) air quality monitoring stations. 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 Brawley, Calexico, El Centro, Niland, and Westmorland monitors on October 20, 2017. After review, CARB submitted the INPEE, for the October 20, 2017 event in July of 2017. The submitted request included a brief description of the meteorological conditions for October 20, 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.

[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 October 20, 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 424 µg/m^3 measured by the Brawley monitor; 319 µg/m^3 measured by the Calexico monitor; 187 µg/m^3 measured by the El Centro monitor; 236 µg/m^3 measured by the Niland monitor; and 337 µg/m^3 measured by the Westmorland monitor on October 20, 2017.

(B) Concurrently with the Public Review period for the October 20, 2017 exceptional event, the ICAPCD is formally submitting to CARB for remittance to USEPA the Draft October 20, 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

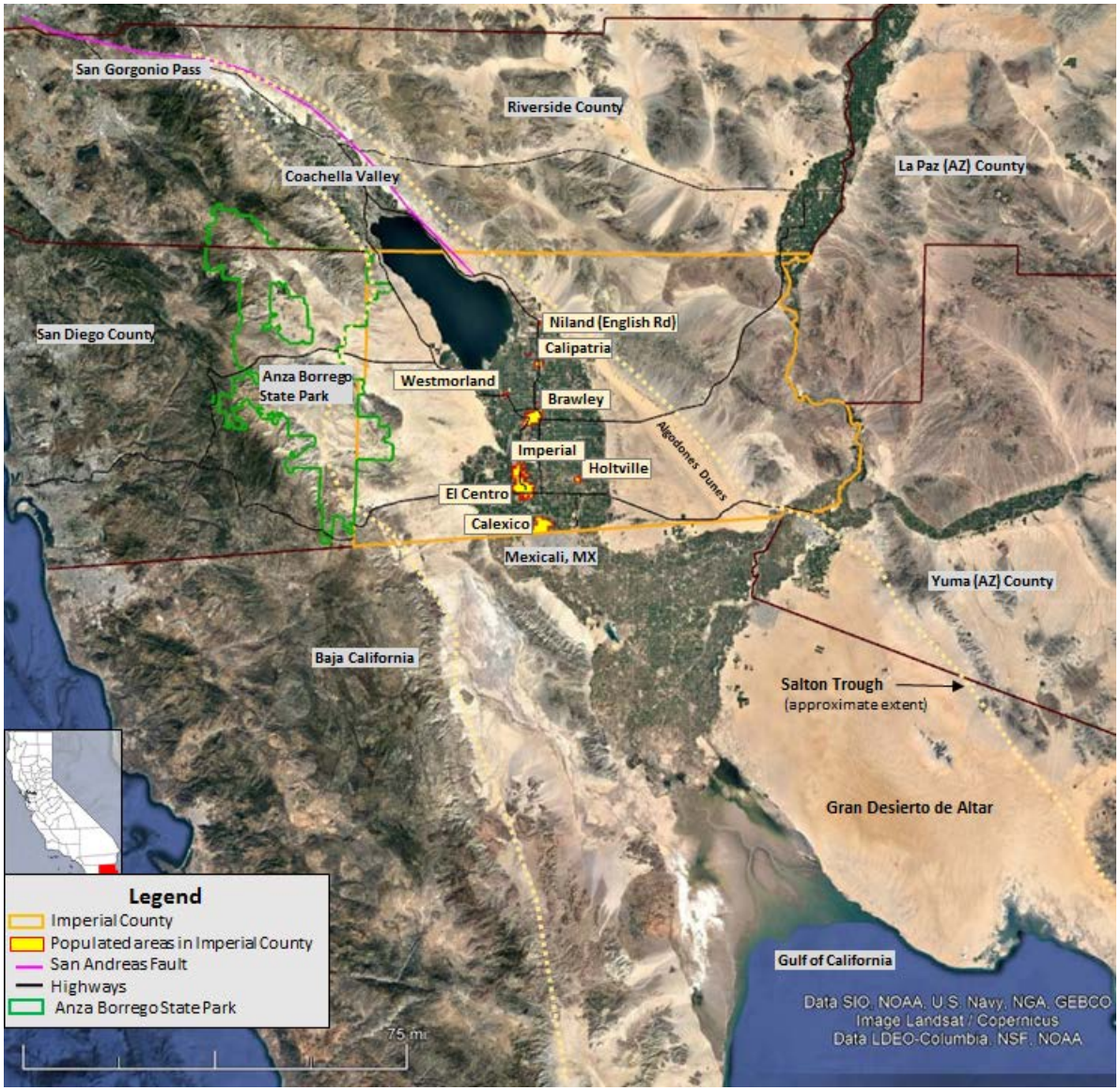


Fig 1-1: Imperial County a Southern California border region, within far southeast California bordering Arizona and Mexico has a small economically diverse region with a population of 174,528

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 Friday, October 20, 2017 the National Weather Service (NWS) offices in Phoenix and San Diego issued Area Forecast Discussions describing a strong Pacific trough that was poised to move into the Pacific Northwest with heights trailing southward through the Great Basin.[4] As a result onshore gradients increased creating gusty westerly winds along the mountains and deserts within San Diego County and within Imperial and Yuma Counties.[5] The severity of the winds caused the Phoenix office to issued the first Urgent Weather Message for southwestern Imperial County, forecasting sustained winds between 30-40 mph and gusts to 45-55 mph.[6] In total there were seven (7) Urgent Weather Messages that advised of advisory level winds within Riverside, San Diego, Imperial and Yuma counties. In addition, Phoenix issued blowing dust advisories for Imperial and Yuma counties.[7]

Overall, the event, as it occurred, was best described by the Phoenix office in one its early Area Forecast Discussions when it described the "…stronger Pacific trough…" as moving into the "…Pacific Northwest with heights trailing southward through the Great Basin..." by Friday, October 20, 2017.[8] The Phoenix office further described the obvious, based on model analysis, that increasing winds would be the "…first sensible impact across the region, with breezy to windy conditions for Friday…" with peak gusts forecasted around 30 mph for "…spots downwind of the Peninsular Ranges in southeast CA.." As the days got closer to Friday, October 20, 2017 aviation updates were made by both NWS offices to include increasingly strong westerly and southwesterly winds within southeastern California resulting from the Pacific weather system approaching from the west.[9] The severity of the gusty westerly winds prompted both NWS office to include the possibility of blowing dust within their aviation updates by Thursday, October 19, 2017.[10] **Appendix A** contains all pertinent NWS notices.

[4] National Weather Service, Area Forecast Discussion, Oct., 17, 2017, Phoenix office, 339am MST
[5] National Weather Service, Area Forecast Discussion, Oct., 20, 2017, Phoenix office, 324am MST and San Diego office, 858am PDT
[6] National Weather Service, Urgent Weather Message, Oct., 19, 2017, Phoenix office, 205pm MST
[7] National Weather Service, Urgent Weather Message, Oct., 20, 2017, Phoenix office, 115am MST
[8] National Weather Service, Area Forecast Discussion, Oct., 17, 2017, Phoenix office, 339am MST
[9] National Weather Service, Area Forecast Discussion, Oct., 18, 2017, Phoenix office, 1040pm MST
[10] National Weather Service, Area Forecast Discussion, Oct., 19, 2017, Phoenix office, 1035pm MST and San Diego office, 930am PDT

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

On October 20, 2017, the air monitors in Imperial, Riverside and Yuma counties measured elevated concentrations of particulate matter when a forecasted strong Pacific trough brought gusty westerly winds across southeastern California and western Arizona. The system was largely devoid of moisture and as a result strong gusty westerly winds ahead of the dry cold front generated emissions from within the open mountain ranges and surrounding open natural deserts within San Diego and Imperial counties. These windblown dust emissions were transported to all the Imperial County regional air quality monitors causing an exceedance of the PM_{10} NAAQS (**Table 2-1**).

FIGURE 2-1
MONITORING AND METEOROLOGICAL SITES

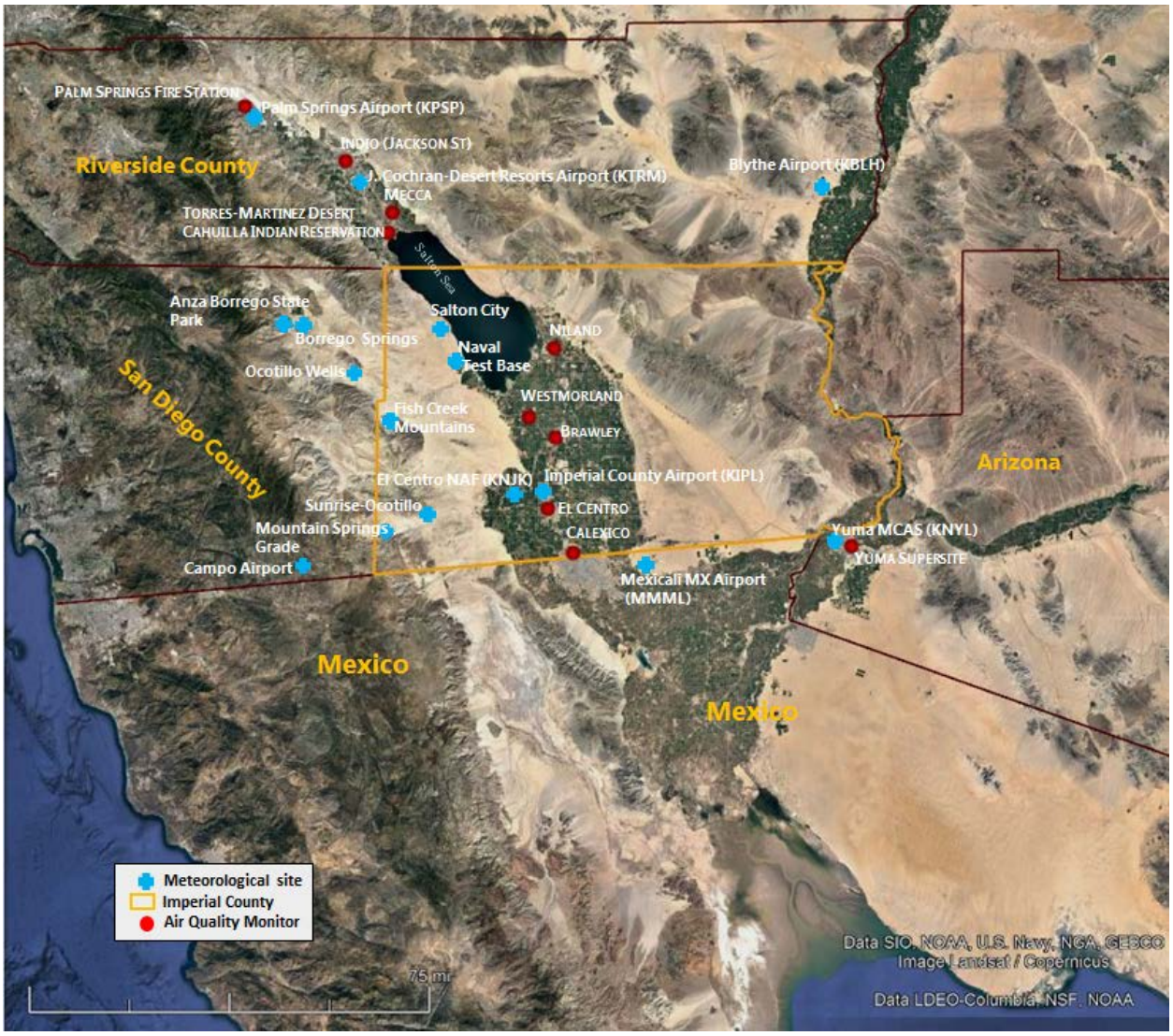


Fig 2-1: Includes a general location of the sites used in this analysis. The site furthest south is in Mexicali, Mexico and the site furthest north is the Palm Springs Fire Station

TABLE 2-1
HOURLY CONCENTRATIONS OF PARTICULATE MATTER

		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	20171019	40	38	48	37	30	38	39	47	47	32	41	32	39	51	27	44	45	102	60	50	54	42	36	46	102	44
	20171020	45	43	45	41	72	79	64	29	25	15	17	26	310	141	114	71	53	31	24	20	15	22	16	19	**310**	55
	20171021	14	13	14	16	11	12	18	5	5	8	13	16	16	16	18	17	23	21	14	13	19	23	24	13	24	15
INDIO	20171019	44	50	43	50	49	49	58	56	50	96	69	43	49	73	65	83	106	167	267	174	134	88	84	57	267	83
	20171020	75	106	79	100	60	193	79	52	62	53	26	59	176	164	386	327	105	81	53	33	45	58	35	54	**386**	102
	20171021	27	14	12	14	20	17	17	14	10	12	18	16	22	38	20	22	25	36	29	23	29	20	14	11	38	20
MECCA	20171019	56	49	37	43	41	46	58	76	72	75	62	55	48	48	52	99	67	95	88	192	68	35	102	74	192	68
	20171020	59	151	127	79	57	50	149	158	221	58	30	40	108	357	629	572	183	131	111	55	71	24	46	26	**629**	145
	20171021	27	21	16	14	14	16	21	9	24	25	29	24	26	24	25	28	39	45	12	22	74	38	35	29	74	26
TORRES-MARTINEZ	20171019	51	43	38	51	39	89	103	110	74	72	70	51	59	53	119	127	109	132	135	135	117	90	173	107	173	89
	20171020	88	514	121	226	63	70	69	76	181	69	40	38	63	129	754	139	201	415	129	55	195	81	29	58	**754**	158
	20171021	74	61	33	25	48	45	26	40	39	27	26	26	24	27	27	23	31	50	73	29	21	17	18	15	74	34
WESTMORLAND	20171019	29	28	37	31	26	38	106	995	65	55	59	34	66	65	85	215	76	139	111	70	79	141	111	224	995	120
	20171020	88	273	64	150	209	139	197	474	359	669	533	663	995	995	995	205	117	118	72	64	261	413	30	11	**995**	337
	20171021	13	17	16	20	24	34	48	83	42	38	37	34	33	26	27	34	53	55	112	80	110	114	72	110	114	51
BRAWLEY	20171019	22	21	24	25	26	66	100	208	74	70	32	51	47	49	190	179	443	90	56	109	132	64	105	178	443	98
	20171020	266	203	214	98	128	328	935	995	995	612	342	477	995		932	672	175	96	92	136	168	337	205	369	**995**	424
	20171021	17	17	16	20	31	30	63	57	54	43	35	38	32	27	28	39	53	64	63	59	62	40	48	88	88	42
NILAND	20171019	37	37	53	43	42	56	109	69	74	103	50	26	27	50	57	127	67	271	208	123	241	94	138	65	271	90
	20171020	75	61	71	159	146	75	127	62	233	567	995	858	995	308	74	96	90	48	67	184	204	115	31	23	**995**	236
	20171021	16	22	19	20	22	22	30	32	37	47	32	36	29	29	35	33	33	33	33	20	44	115	61	46	115	35
EL CENTRO	20171019	28	7	25	27	20	43	70	137	105	76	63	63	49	37	164	133	83	72	65	70	69	100	43	64	164	67
	20171020	33	67	73	382	584	106	397	296	128	108	55	74	706	843	216	99	68	86	36	33	47	22	21	18	**843**	187
	20171021	11	8	10	15	15	17	20	52	42	39	36	37	47	39	37	37	37	57	48	54	52	57	45	40	57	35
CALEXICO	20171019	22	20	22	40	62	153	139	182	121	70			56	55	64	199	272	84	39	62	40	56	651	367	651	126
	20171020	601	840	653	266	331	77	139	164	271	242	126	118	800	985	985	272	233	73	34	86	246	61	37	26	**985**	319
	20171021	20	11	15	10	16	16	20	36	49	65	64	41	39	37	34	30	37	63	76	49	54	58	48	41	76	38
YUMA SUPERSITE (PST)	20171019	36	61	34	36	39	94	135	55	72	45	64	69	63	56	50	50	75	86	121	88	56	66	74	70	135	66
	20171020	66	50	42	39	63	88	257	594	362	129	121	133	73	102	508	896	555	248	111	92	64	35	29	44	**896**	195
	20171021	75	101	39	25	27	69	88	62	86	81	48	47	80	52	46	40	46	38	20	28	25	24	28	20	101	49
YUMA SUPERSITE (MST)	20171018	70	84	69	78	72	100	162	226	145	135	108	122	74	47	33	20	30	53	107	105	106	79	89	27	226	89
	20171019	29	36	61	34	36	39	94	135	55	72	45	64	69	63	56	50	50	75	86	121	88	56	66	74	135	64
	20171020	70	66	50	42	39	63	88	257	594	362	129	121	133	73	102	508	896	555	248	111	92	64	35	29	**896**	196
	20171021	44	75	101	39	25	27	69	88	62	86	81	48	47	80	52	46	40	46	38	20	28	25	24	28	101	50
	20171022	20	12	11	9	11	17	20	14	30	44	50	20	13	16	11	8	13	28	68	28	22	23	34	23	68	22

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

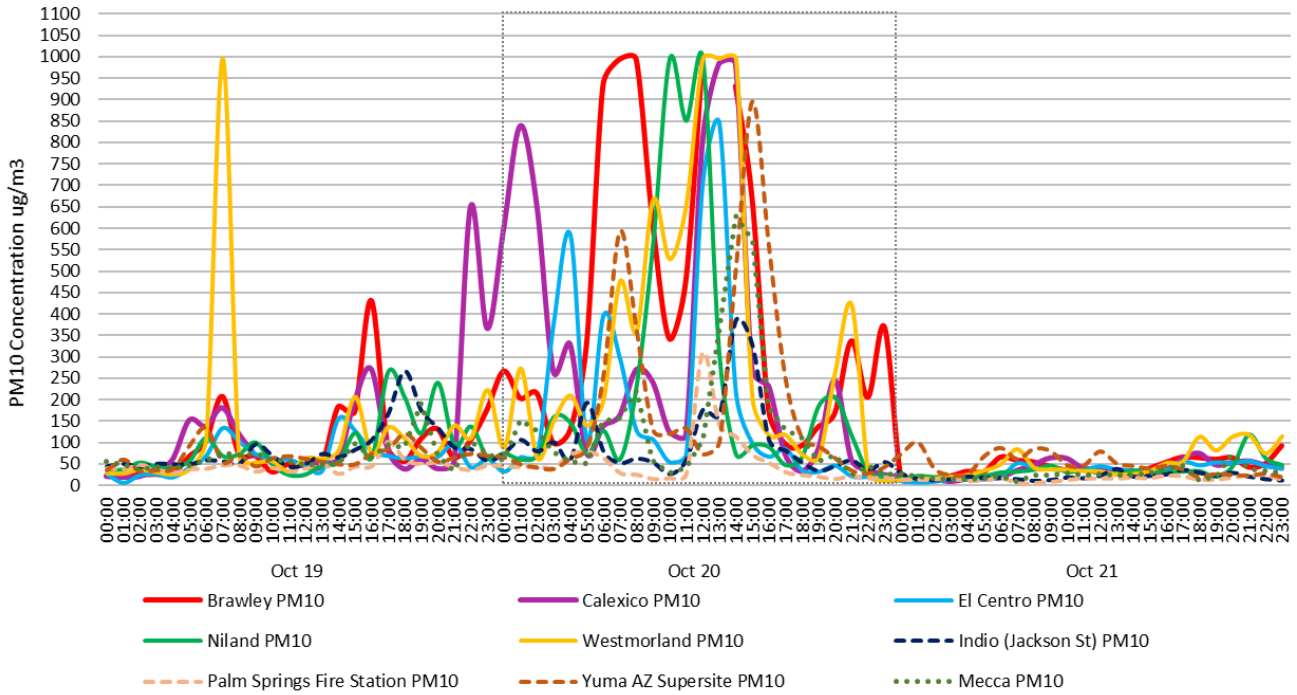


Fig 2-2: is a three-day graphical representation of the PM_{10} concentrations measured at the sites identified in **Table 2-1**. Elevated concentrations are notable among sites located further southeast than sites located further north

Wind speed, wind direction and the airflow patterns combined all help explain how windblown emissions resulting from the strong gusty westerly winds associated with the passing of the trough affected all monitors in Imperial County on Friday, October 20, 2017.

As mentioned above, the early weather forecast notices issued by both the San Diego and Phoenix NWS offices indicated that a strong Pacific trough would increase the onshore pressure gradient and produce strong gusty westerly winds across the Desert Southwest including southeastern California by Friday, October 20, 2017. As mentioned above, seven (7) Urgent Weather Messages were issued by the NWS office in San Diego and Phoenix advising of advisory level westerly winds within San Diego mountains and Imperial County (**Appendix A**).

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

Sites farther west of Imperial County measured elevated wind speeds sooner than the air quality monitoring stations within Imperial County, coincident with measured elevated concentrations.

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

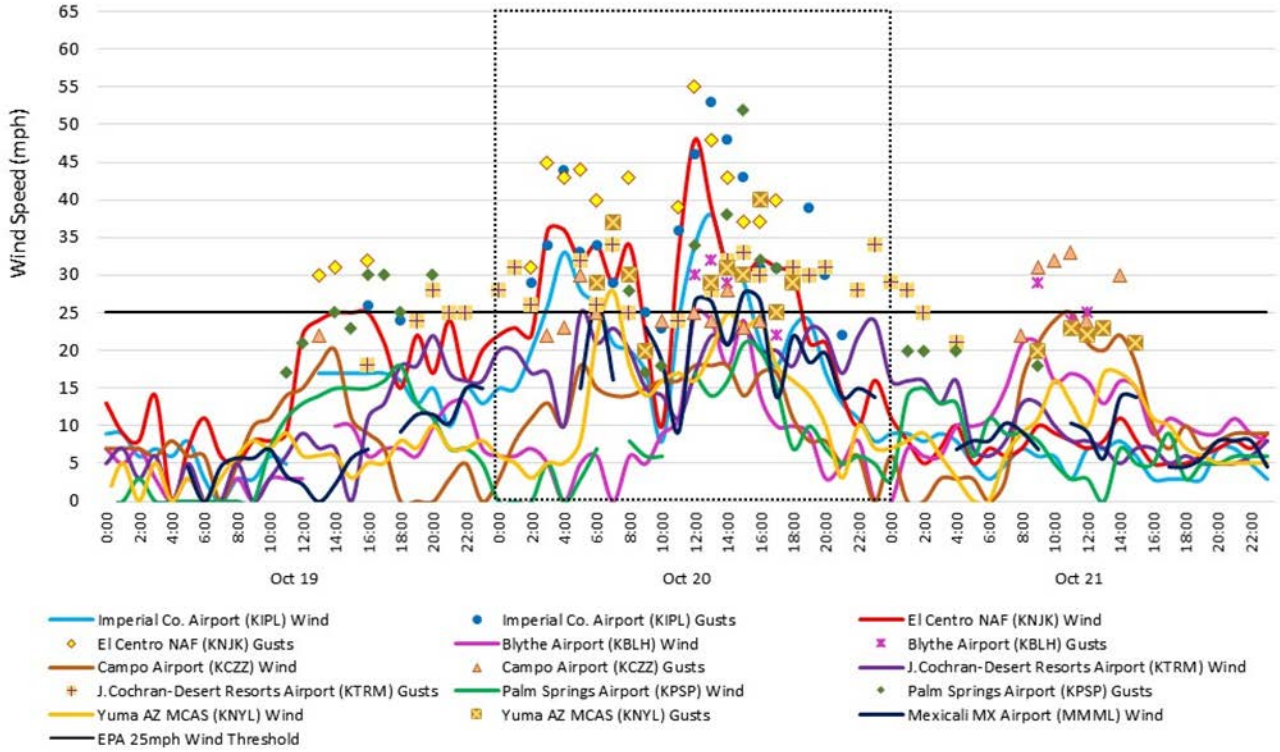


Fig 2-3: is a three-day graphical representation of the measured wind speed and wind gust (if available) from local and neighboring airports. Note the elevated wind speeds are consistent for sites with minor variations. All data (except MMML from the University of Utah MesoWest) derived from the Local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

FIGURE 2-4
WIND SPEEDS AND GUST UPSTREAM SITES

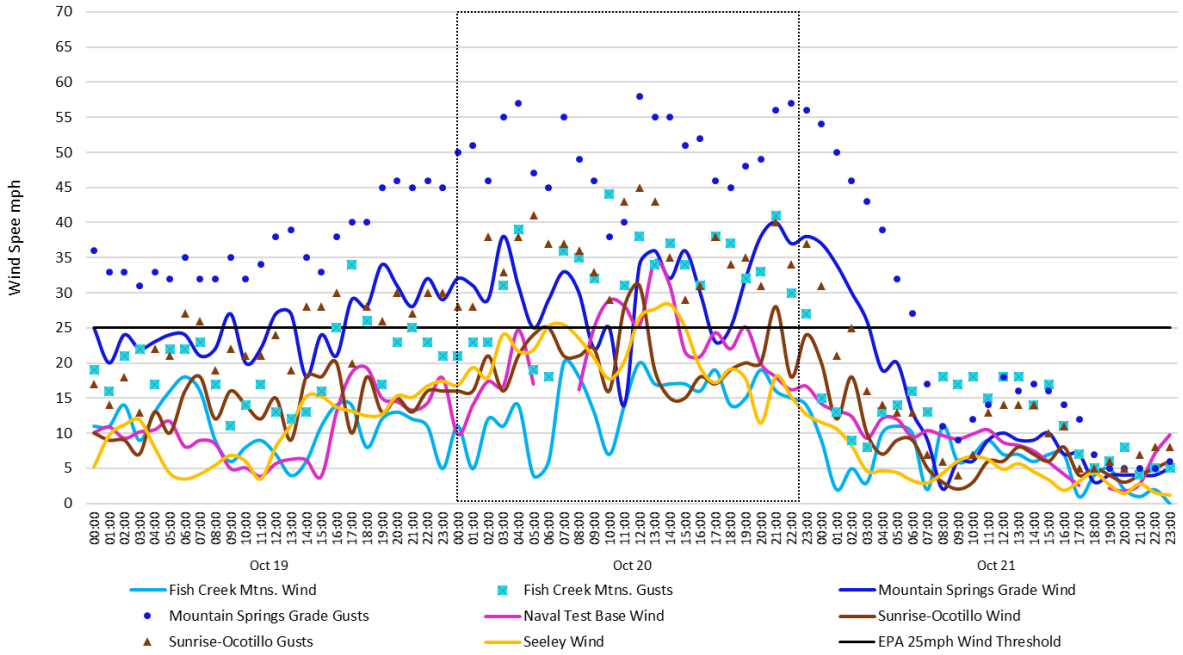


Fig 2-4: is a three-day graphical representation of the measured wind speed and wind gust (if available) from sites located upstream from the Imperial County monitors. All data derived from the University of Utah's Meso West https://mesowest.utah.edu/index.html

The National Oceanic and Atmospheric Administration (NOAA) Laboratory HYSPLIT back-trajectory HYSPLIT models[11] provide supporting evidence of the westerly airflow within Imperial County on October 20, 2017. As an all-day event, the HYSPLIT back-trajectory models in **Figures 2-5 through 2-7** depict the airflow during the morning (0100 PST), the afternoon (1200 PST) and evening (2300 PST) to help illustrate the shift of airflow from a northwesterly direction, to a west direction and as the system passed through back to a northwesterly direction.

Figure 2-5 depicts the general airflow from a northwest direction coincident with elevated concentrations above 100 µg/m^3 at the Westmorland, Brawley and Calexico monitors. **Figure 2-6** depicts the mid-day (afternoon) airflow shift to the west coincident with peak hourly measured concentrations at the Westmorland, Brawley and Niland monitors. **Figure 2-7** depicts the shift back to a northwest airflow coincident with lower level measured concentrations below 100 µg/m^3 at the Westmorland, Niland, El Centro, and

[11] 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.

Calexico monitors. As the system moved further east, concentrations reduced significantly.

FIGURE 2-5
HYSPLIT MODEL All SITES OCTOBER 20, 2017 0100 PST

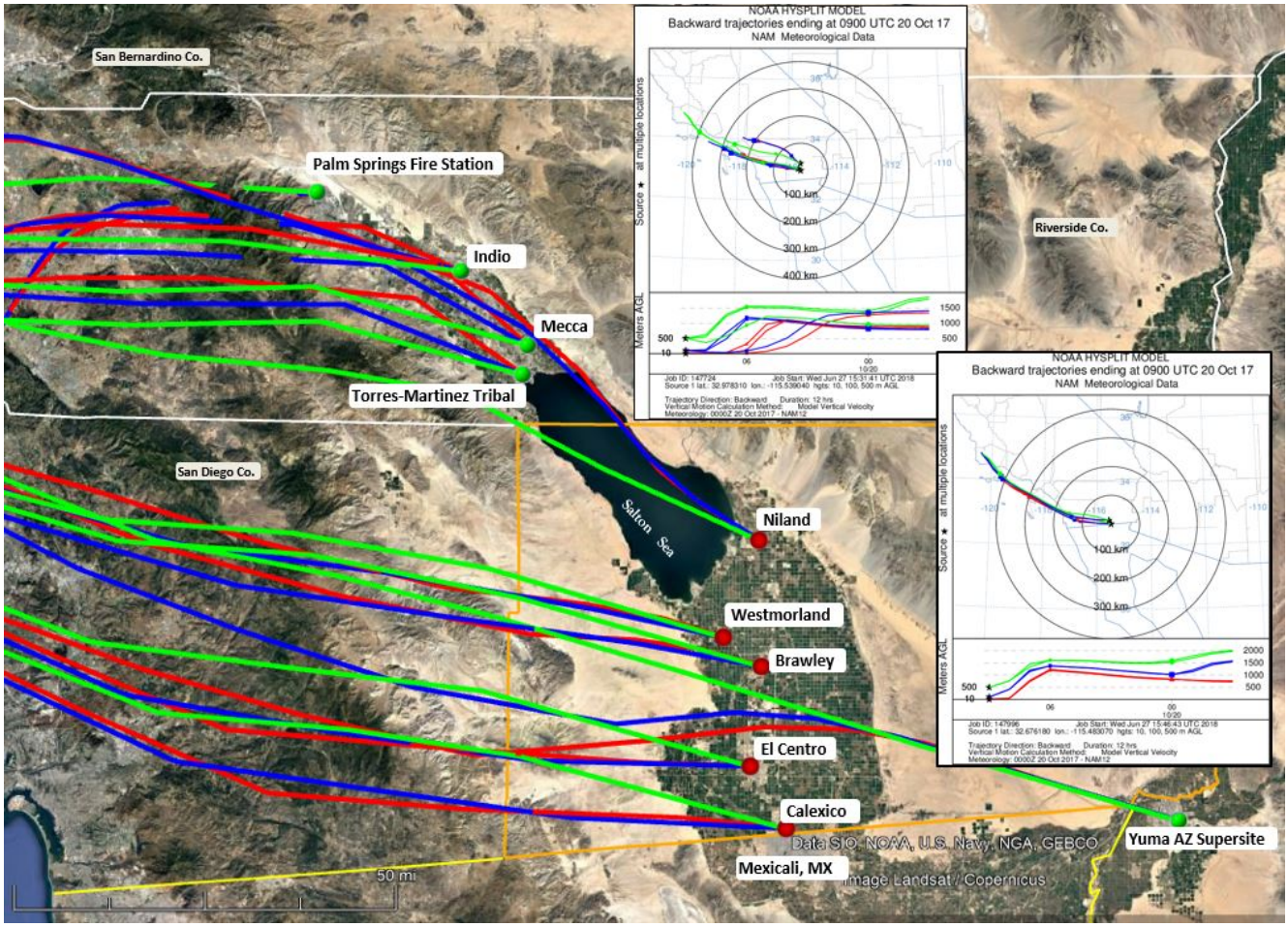


Fig 2-5: A 12-hour back trajectory ending at 0100 PST. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

FIGURE 2-6
HYSPLIT MODEL ALL SITES OCTOBER 20, 2017 1200 PST

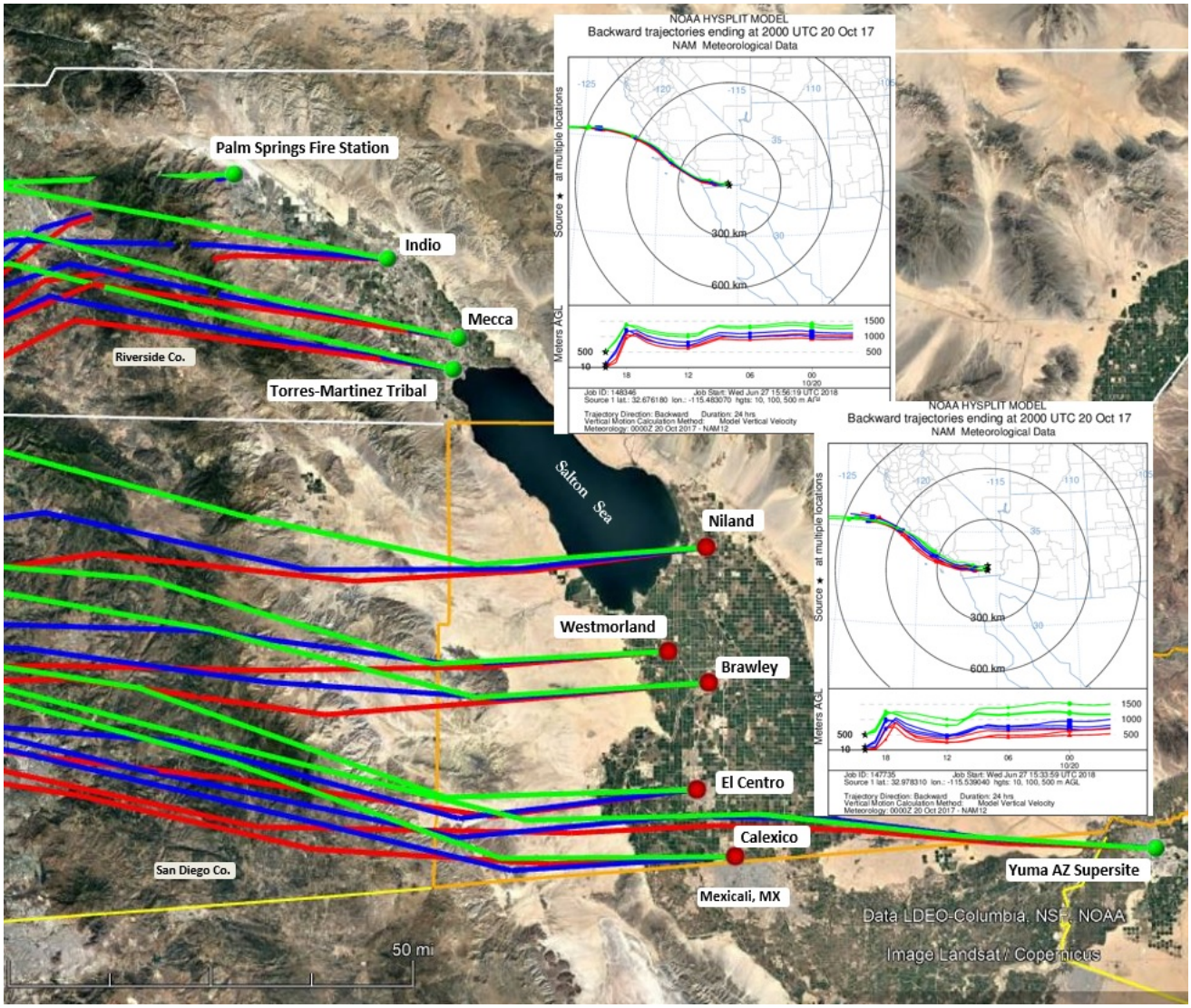


Fig 2-6: A 24-hour back trajectory ending at 1200 PST for all sites identified in **Table 2-1**. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

FIGURE 2-7
HYSPLIT MODEL ALL SITES OCTOBER 20, 2017 2300 PST

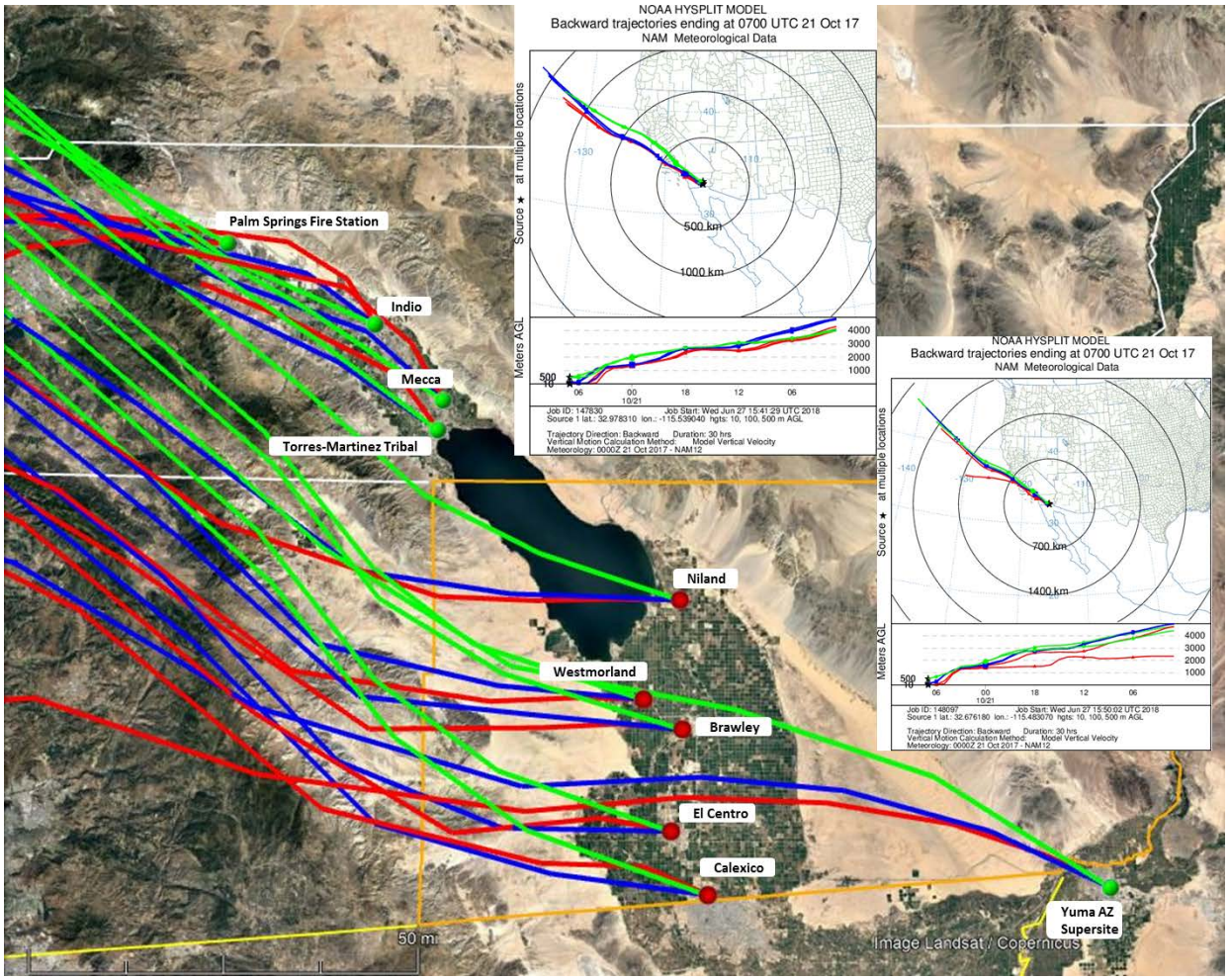


Fig 2-7: A 30-hour back trajectory ending at 2300 PST for all sites identified in **Table 2-1**. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

As strong gusty westerly winds blew over open natural mountains and desert areas west of Imperial County, fugitive windblown dust primarily affected all air quality monitors throughout the southeastern region. As the NWS offices realized that winds would increase to advisory level, seven (7) Urgent Weather Messages were issued advising of wind speeds in excess of 25 mph and gusts above 45 mph. Imperial County Airport (KIPL) and the El Centro Naval Air Facility (NAF) (KNJK) measured winds or gusts above 25 mph, KIPL measured peak winds at 38 mph and peak gusts of 53 mph. KNJK measured peak winds of 48 mph and peak gusts of 55 mph. Meteorological monitors within the southern desert measured winds well over 25 mph, with most measuring wind speeds of 30 mph or above. Mexicali Airport (MMML) in Mexico and Yuma MCAS (KNYL) both reported blowing dust at the respective airports.

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, a strong Pacific trough moved over the region strengthening the onshore pressure gradient generating strong gusty westerly winds across the desert southwest. The system provided less than two tenths of an inch of precipitation fell within a few areas in the San Diego County mountains as a result, the strong gusty westerly winds easily generated emissions within the natural open mountains in San Diego and transported windblown dust causing an exceedance at all the air quality monitors in Imperial County.[12] The significant amount of fugitive windblown dust, generated by the gusty westerly winds was captured by satellite (**Figure 3-2**) and described by the Smoke Text Product, issued by NOAA, as "an impressive dust storm" that made its way into southwestern Arizona (**Appendix C**).

While elevated wind speeds play a significant and important role in the transportation of dust, gust plays an equally significant role in deposition of particulates onto a monitor and the overall affect onto ambient air.[13] As winds and gusts increased on October 20, 2017 and transported windblown dust from open natural mountains and 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 the degradation of air quality to a moderate or unhealthy level. In addition, the NWS service issued Area Forecast Discussions and Urgent Weather Messages advising of the potential for advisory level winds and blowing dust.[14]

[12] National Weather Service, Area Forecast Discussion, Oct., 19, 2017, San Diego office, 930am PDT

[13] 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

[14] National Weather Service, Area Forecast Discussion, Oct., 19, 2017, San Diego office, 930am PDT

FIGURE 3-1
TERRA MODIS CAPTURES DUST OVER IMPERIAL COUNTY

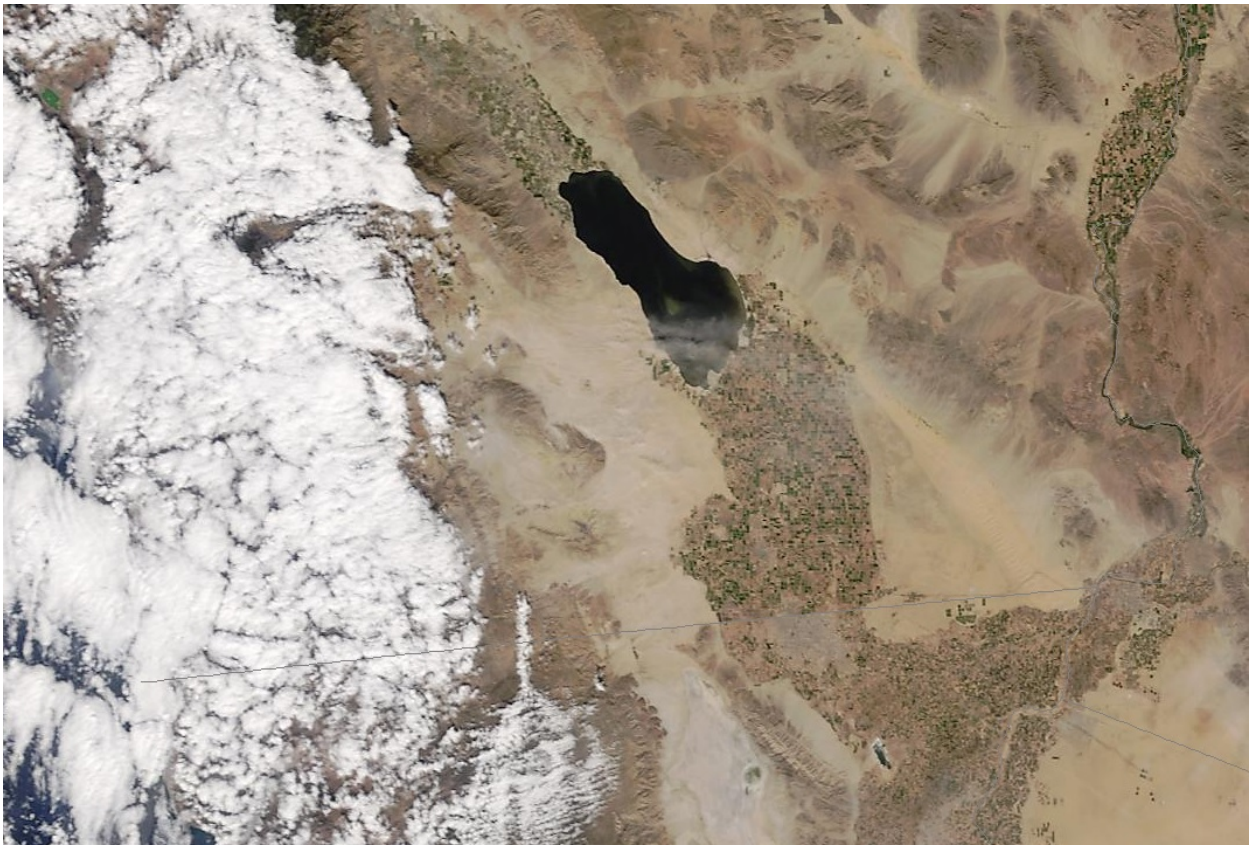


Fig 3-1: The MODIS instrument onboard the Terra satellite captured thick dust being transported eastward across much of Imperial County at ~1030 PST on October 20, 2017. Source: MODIS Today; http://ge.ssec.wisc.edu/modis-today

FIGURE 3-2
AQUA MODIS CAPTURES DUST OVER IMPERIAL COUNTY

Fig 3-2: The MODIS instrument onboard the Aqua satellite captured thick dust being transported eastward across much of Imperial County at ~1330 PST on October 20, 2017. Source: MODIS Today; http://ge.ssec.wisc.edu/modis-today

Figure 3-3 below provides an illustration of some of the meteorological conditions as described above and demonstrated in the HYSPLITS, for October 20, 2017, which affected air quality in Imperial County causing an exceedance at all Imperial County monitors. As windblown dust emissions, generated within the natural open mountains within San Diego blew into and over natural open deserts within Imperil County air quality was affected by a significant amount of dust.

FIGURE 3-3
VISUAL RAMP-UP ANALYSIS AS DISCUSSED FOR OCTOBER 20, 2017

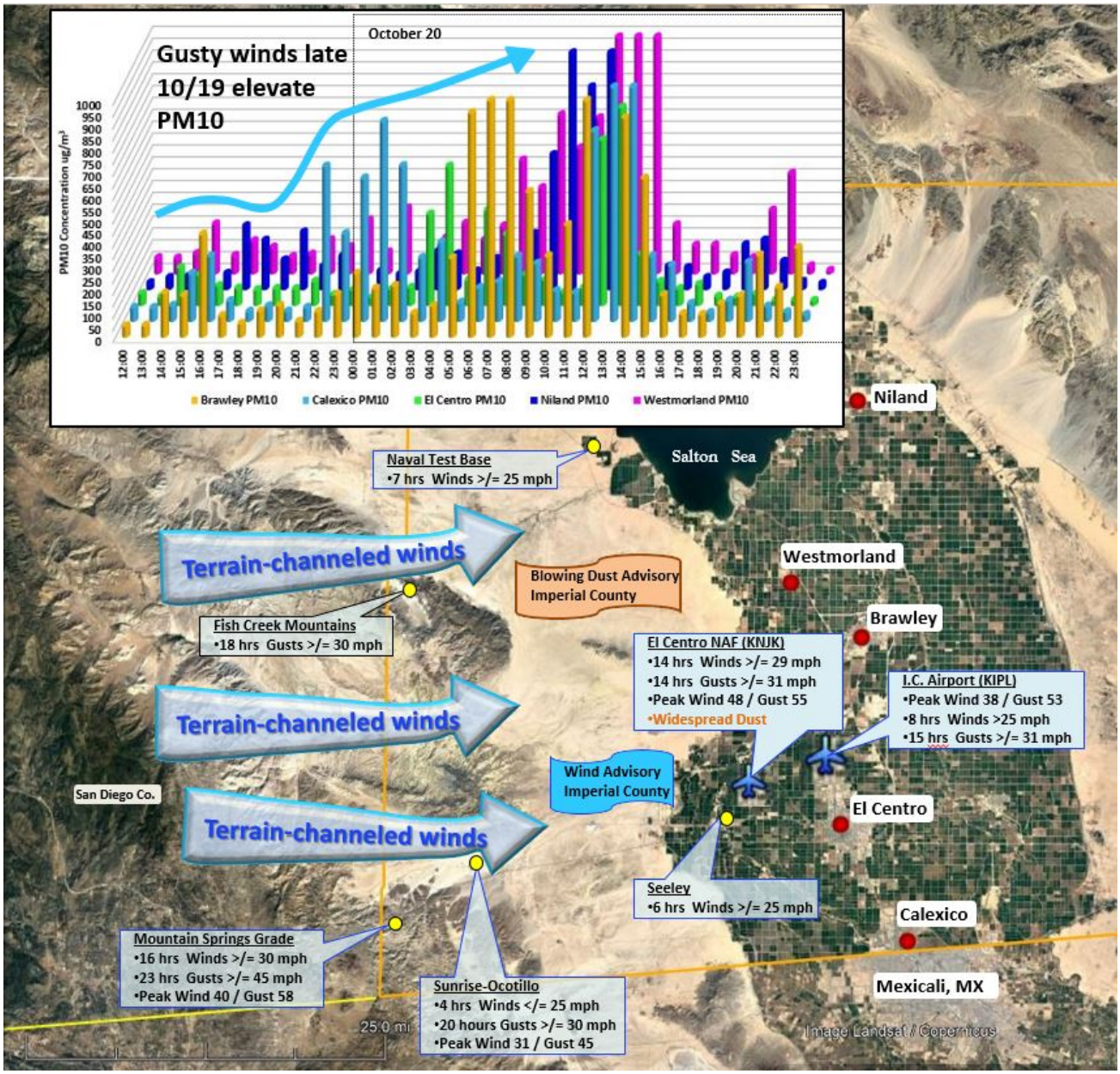


Fig 3-4: Gusty elevated winds at upstream sites transported dust into Imperial County from the desert mountain slopes of far eastern San Diego County. Strong winds were channeled by terrain along desert slopes and across the desert floor. Air quality data is from the EPA's AQS data bank. Google Earth 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 do.[15] The Imperial County Airport (KIPL), the El Centro Naval Air Facility (KNJK) and the Desert Resorts Airport (KTRM) reported reduced visibility coincident with elevated wind speeds, wind gusts and elevated hourly concentrations of particulates at all air quality monitors. **Figure 3-3** and **Tables 3-1 through 3-6** provide information regarding the reduced visibility in Imperial County and the relation to hourly concentrations at local air monitors.

While **Figure 3-4** is a graphical representation of the reduced visibility within Imperial County and surrounding areas, **Tables 3-1 through 3-6** provide a temporal relationship of wind speeds, wind direction, wind gusts (if available), and PM_{10} concentrations at all 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 3-4,** visibility reduced at three of the major airports, the El Centro NAF (KNJK), the Imperial County Airport (KIPL) and the Desert Resorts Airport (KTRM) throughout the day on October 20, 2017 coincident with elevated hourly concentrations at the air quality monitors in Imperial County.

[15] 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 3-4
72-HOUR TIME SERIES PM_{10} CONCENTRATIONS AND VISIBILITY

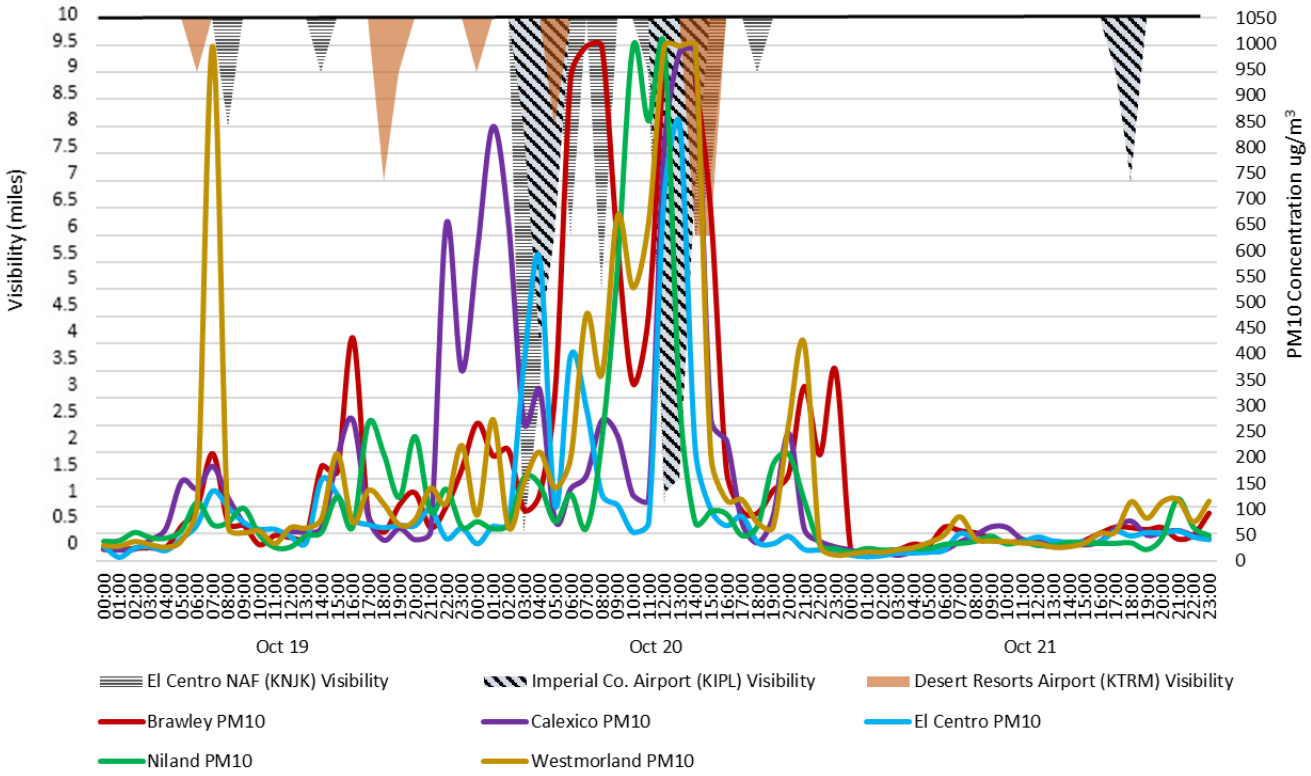


Fig 3-4: is a graphical representation of the compiled data from Imperial County Airport (KIPL), the El Centro NAF (KNJK), Jacqueline Cochran-Desert Resorts Airport (KTRM). Reported reduced visibility is coincident with elevated winds and hourly levels of concentrations either just prior to peak concentrations or after. Visibility data from the NCEI's QCLCD data bank except for MMML which is from the University of Utah's MesoWest.

Because the EPA accepts a high wind threshold for sustained winds of 25 mph in California and 12 other states[16] 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 monitor with a final table comparing select meteorological sites with the Brawley and Westmorland monitors.

[16] "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 OCTOBER 20, 2017

MOUNTAIN SPRINGS GRADE (TNSC1)				SUNRISE-OCOTILLO (IMPSD)				EL CENTRO NAF (KNJK)					IMPERIAL COUNTY AIRPORT (KIPL)				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} ($\mu g/m^3$)
00:50	32	50	214	00:40	16	28	261	00:56	22		260		00:53	15		250	00:00	266
01:50	31	51	219	01:00	16	28	260	01:56	23		250		01:53	15		250	01:00	203
02:50	29	46	219	02:00	21	38	268	02:56	22	31	250		02:53	20	29	250	02:00	214
03:50	38	55	221	03:00	16	33	264	03:56	36	45	260		03:53	26	34	270	03:00	98
04:50	31	57	205	04:20	21	38	255	04:56	36	43	250		04:53	33	44	260	04:00	128
05:50	25	47	223	05:30	24	41	249	05:56	32	44	250		05:53	28	33	250	05:00	328
06:50	29	45	238	06:10	25	37	249	06:56	34	40	260	**DU**	06:53	26	34	250	06:00	935
07:50	33	55	239	07:40	21	37	250	07:56	29	37	250		07:53	21	29	260	07:00	995
08:50	30	49	239	08:10	21	36	255	08:12	34	43	260		08:53	20	30	250	08:00	995
09:50	22	46	234	09:00	22	33	245	09:56	22		250		09:53	17	25	250	09:00	612
10:50	25	38	247	10:00	16	29	252	10:56	10		280		10:53	8	23	240	10:00	342
11:50	14	40	210	11:00	28	43	273	11:56	33	39	280		11:53	24	36	270	11:00	477
12:50	34	58	219	12:10	31	45	273	12:44	48	55	260	**DU**	12:57	34	46	270	12:00	995
13:50	36	55	224	13:00	19	43	265	13:01	39	48	260	**DU**	13:17	38	53	270	13:00	
14:50	32	55	227	14:00	15	35	261	14:56	31	43	260	**DU**	14:53	31	48	270	14:00	932
15:50	36	51	232	15:30	15	29	258	15:56	30	37	250		15:53	29	43	260	15:00	672
16:50	30	52	235	16:00	18	31	256	16:56	32	37	240		16:53	21	31	250	16:00	175
17:50	23	46	238	17:00	17	38	259	17:56	31	40	250		17:53	18	31	250	17:00	96
18:50	25	45	238	18:20	19	34	262	18:56	30		260		18:53	23	30	250	18:00	92
19:50	32	48	235	19:10	20	35	255	19:56	21		260		19:53	24	39	260	19:00	136
20:50	38	49	233	20:30	20	31	246	20:56	21		260		20:53	17	30	270	20:00	168
21:50	40	56	202	21:20	28	40	239	21:56	14		260		21:53	13	22	280	21:00	337
22:50	37	57	203	22:00	18	34	261	22:56	10		260		22:53	11		270	22:00	205
23:50	38	56	206	23:20	24	37	248	23:56	16		260		23:53	8		270	23:00	369

Wind data for KIPL and KNJK from the NCEI's QCLCD system. Wind data for Sunrise-Ocotillo (IMPSD) and Mountain Springs Grade (TNSC1) from the University of Utah's MesoWest system. Wind speeds = mph; Direction = degrees. DU = widespread dust

TABLE 3-2
WIND SPEEDS AND PM_{10} CONCENTRATIONS OCTOBER 20, 2017

MOUNTAIN SPRINGS GRADE (TNSC1)				SUNRISE-OCOTILLO (IMPSD)				EL CENTRO NAF (KNJK)					SEELEY (CI068)				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/G	W/D	HR	PM_{10} ($\mu g/m^3$)
00:50	32	50	214	00:40	16	28	261	00:56	22		260		00:00	17		286	00:00	601
01:50	31	51	219	01:00	16	28	260	01:56	23		250		01:00	19		282	01:00	840
02:50	29	46	219	02:00	21	38	268	02:56	22	31	250		02:00	18		279	02:00	653
03:50	38	55	221	03:00	16	33	264	03:56	36	45	260		03:00	24		293	03:00	266
04:50	31	57	205	04:20	21	38	255	04:56	36	43	250		04:00	22		294	04:00	331
05:50	25	47	223	05:30	24	41	249	05:56	32	44	250		05:00	22		283	05:00	77
06:50	29	45	238	06:10	25	37	249	06:56	34	40	260	**DU**	06:00	25		273	06:00	139
07:50	33	55	239	07:40	21	37	250	07:56	29	37	250		07:00	25		272	07:00	164
08:50	30	49	239	08:10	21	36	255	08:12	34	43	260		08:00	23		276	08:00	271
09:50	22	46	234	09:00	22	33	245	09:56	22		250		09:00	21		262	09:00	242
10:50	25	38	247	10:00	16	29	252	10:56	10		280		10:00	18		263	10:00	126
11:50	14	40	210	11:00	28	43	273	11:56	33	39	280		11:00	20		285	11:00	118
12:50	34	58	219	12:10	31	45	273	12:44	48	55	260	**DU**	12:00	26		298	12:00	800
13:50	36	55	224	13:00	19	43	265	13:01	39	48	260	**DU**	13:00	28		272	13:00	985
14:50	32	55	227	14:00	15	35	261	14:56	31	43	260	**DU**	14:00	28		275	14:00	985
15:50	36	51	232	15:30	15	29	258	15:56	30	37	250		15:00	25		269	15:00	272
16:50	30	52	235	16:00	18	31	256	16:56	32	37	240		16:00	19		262	16:00	233
17:50	23	46	238	17:00	17	38	259	17:56	31	40	250		17:00	17		261	17:00	73
18:50	25	45	238	18:20	19	34	262	18:56	30		260		18:00	19		267	18:00	34
19:50	32	48	235	19:10	20	35	255	19:56	21		260		19:00	18		279	19:00	86
20:50	38	49	233	20:30	20	31	246	20:56	21		260		20:00	11		295	20:00	246
21:50	40	56	202	21:20	28	40	239	21:56	14		260		21:00	18		308	21:00	61
22:50	37	57	203	22:00	18	34	261	22:56	10		260		22:00	15		297	22:00	37
23:50	38	56	206	23:20	24	37	248	23:56	16		260		23:00	13		301	23:00	26

Wind data for KNJK from the NCEI's QCLCD system. Wind data for Sunrise-Ocotillo (IMPSD), Mountain Springs Grade (TNSC1) and Seeley (CI068) from the University of Utah's MesoWest system. Wind speeds = mph; Direction = degrees. DU = widespread dust

TABLE 3-3
WIND SPEEDS AND PM_{10} CONCENTRATIONS OCTOBER 20, 2017

MOUNTAIN SPRINGS GRADE (TNSC1)				SUNRISE-OCOTILLO (IMPSD)				EL CENTRO NAF (KNJK)					SEELEY (CI068)				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/G	W/D	HR	PM_{10} ($\mu g/m^3$)
00:50	32	50	214	00:40	16	28	261	00:56	22		260		00:00	17		286	00:00	33
01:50	31	51	219	01:00	16	28	260	01:56	23		250		01:00	19		282	01:00	67
02:50	29	46	219	02:00	21	38	268	02:56	22	31	250		02:00	18		279	02:00	73
03:50	38	55	221	03:00	16	33	264	03:56	36	45	260		03:00	24		293	03:00	382
04:50	31	57	205	04:20	21	38	255	04:56	36	43	250		04:00	22		294	04:00	584
05:50	25	47	223	05:30	24	41	249	05:56	32	44	250		05:00	22		283	05:00	106
06:50	29	45	238	06:10	25	37	249	06:56	34	40	260	**DU**	06:00	25		273	06:00	397
07:50	33	55	239	07:40	21	37	250	07:56	29	37	250		07:00	25		272	07:00	296
08:50	30	49	239	08:10	21	36	255	08:12	34	43	260		08:00	23		276	08:00	128
09:50	22	46	234	09:00	22	33	245	09:56	22		250		09:00	21		262	09:00	108
10:50	25	38	247	10:00	16	29	252	10:56	10		280		10:00	18		263	10:00	55
11:50	14	40	210	11:00	28	43	273	11:56	33	39	280		11:00	20		285	11:00	74
12:50	34	58	219	12:10	31	45	273	12:44	48	55	260	**DU**	12:00	26		298	12:00	706
13:50	36	55	224	13:00	19	43	265	13:01	39	48	260	**DU**	13:00	28		272	13:00	843
14:50	32	55	227	14:00	15	35	261	14:56	31	43	260	**DU**	14:00	28		275	14:00	216
15:50	36	51	232	15:30	15	29	258	15:56	30	37	250		15:00	25		269	15:00	99
16:50	30	52	235	16:00	18	31	256	16:56	32	37	240		16:00	19		262	16:00	68
17:50	23	46	238	17:00	17	38	259	17:56	31	40	250		17:00	17		261	17:00	86
18:50	25	45	238	18:20	19	34	262	18:56	30		260		18:00	19		267	18:00	36
19:50	32	48	235	19:10	20	35	255	19:56	21		260		19:00	18		279	19:00	33
20:50	38	49	233	20:30	20	31	246	20:56	21		260		20:00	11		295	20:00	47
21:50	40	56	202	21:20	28	40	239	21:56	14		260		21:00	18		308	21:00	22
22:50	37	57	203	22:00	18	34	261	22:56	10		260		22:00	15		297	22:00	21
23:50	38	56	206	23:20	24	37	248	23:56	16		260		23:00	13		301	23:00	18

Wind data for KNJK from the NCEI's QCLCD system. Wind data for Sunrise-Ocotillo (IMPSD), Mountain Springs Grade (TNSC1) and Seeley (CI068) from the University of Utah's MesoWest system. Wind speeds = mph; Direction = degrees. DU = widespread dust

TABLE 3-4
WIND SPEEDS AND PM_{10} CONCENTRATIONS OCTOBER 20, 2017

EL CENTRO NAF					IMPERIAL COUNTY AIRPORT (KIPL)				NAVAL TEST BASE				NILAND (English Rd)				NILAND (English Rd)	
HR	W/S	W/G	W/D	Obs.	HR	W/S	W/G	W/D	HR	W/S	W/G	W/D		W/S	W/G	W/D	HR	PM_{10} ($\mu g/m^3$)
00:56	22		260		00:53	15		250	00:00	10		276	00:00	7		234	00:00	75
01:56	23		250		01:53	15		250	01:00	14		268	01:00	4		293	01:00	61
02:56	22	31	250		02:53	20	29	250	02:00	17		272	02:00	8		260	02:00	71
03:56	36	45	260		03:53	26	34	270	03:00	17		274	03:00	22		260	03:00	159
04:56	36	43	250		04:53	33	44	260	04:00	25		267	04:00	18		263	04:00	146
05:56	32	44	250		05:53	28	33	250	05:00	17		273	05:00	19		253	05:00	75
06:56	34	40	260	**DU**	06:53	26	34	250	06:00				06:00	16		259	06:00	127
07:56	29	37	250		07:53	21	29	260	07:00				07:00	19		268	07:00	62
08:12	34	43	260		08:53	20	30	250	08:00	16		280	08:00	23		254	08:00	233
09:56	22		250		09:53	17	25	250	09:00	25		275	09:00	28		255	09:00	567
10:56	10		280		10:53	8	23	240	10:00	29		282	10:00	29		260	10:00	995
11:56	33	39	280		11:53	24	36	270	11:00	28		258	11:00	26		260	11:00	858
12:44	48	55	260	**DU**	12:57	34	46	270	12:00	25		260	12:00	29		255	12:00	995
13:01	39	48	260	**DU**	13:17	38	53	270	13:00	34		262	13:00	26		255	13:00	308
14:56	31	43	260	**DU**	14:53	31	48	270	14:00	31		257	14:00	24		251	14:00	74
15:56	30	37	250		15:53	29	43	260	15:00	22		255	15:00	25		246	15:00	96
16:56	32	37	240		16:53	21	31	250	16:00	21		250	16:00	24		240	16:00	90
17:56	31	40	250		17:53	18	31	250	17:00	24		262	17:00	23		243	17:00	48
18:56	30		260		18:53	23	30	250	18:00	22		270	18:00	23		247	18:00	67
19:56	21		260		19:53	24	39	260	19:00	25		274	19:00	21		248	19:00	184
20:56	21		260		20:53	17	30	270	20:00	20		271	20:00	20		248	20:00	204
21:56	14		260		21:53	13	22	280	21:00	18		270	21:00	19		251	21:00	115
22:56	10		260		22:53	11		270	22:00	16		273	22:00	16		260	22:00	31
23:56	16		260		23:53	8		270	23:00	17		277	23:00	16		256	23:00	23

Wind data for KIPL and KNJK from the NCEI's QCLCD system. Wind data for Naval Test Base from AQMIS2. Windata for Niland from the EPA AQS respositroy. Wind speeds = mph; Direction = degrees. DU = widespread dust

TABLE 3-5
WIND SPEEDS AND PM_{10} CONCENTRATIONS OCTOBER 20, 2017

SUNRISE-OCOTILLO (IMPSD)				EL CENTRO NAF (KNJK)					IMPERIAL COUNTY AIRPORT (KIPL)				FISH CREEK MTNS. (FHCC1)				WESTMORLAND	
				HR	W/S	W/G	W/D	Obs.	HR	W/S	W/G	W/D	HR	W/S	W/G	W/D	HR	PM_{10} ($\mu g/m^3$)
00:40	16	28	261	00:56	22		260		00:53	15		250	00:26	11	21	240	00:00	88
01:00	16	28	260	01:56	23		250		01:53	15		250	01:26	5	23	256	01:00	273
02:00	21	38	268	02:56	22	31	250		02:53	20	29	250	02:26	12	23	227	02:00	64
03:00	16	33	264	03:56	36	45	260		03:53	26	34	270	03:26	11	31	243	03:00	150
04:20	21	38	255	04:56	36	43	250		04:53	33	44	260	04:26	14	39	273	04:00	209
05:30	24	41	249	05:56	32	44	250		05:53	28	33	250	05:26	4	19	319	05:00	139
06:10	25	37	249	06:56	34	40	260	**DU**	06:53	26	34	250	06:26	6	18	327	06:00	197
07:40	21	37	250	07:56	29	37	250		07:53	21	29	260	07:26	20	36	285	07:00	474
08:10	21	36	255	08:12	34	43	260		08:53	20	30	250	08:26	18	35	260	08:00	359
09:00	22	33	245	09:56	22		250		09:53	17	25	250	09:26	13	32	269	09:00	669
10:00	16	29	252	10:56	10		280		10:53	8	23	240	10:26	7	44	300	10:00	533
11:00	28	43	273	11:56	33	39	280		11:53	24	36	270	11:26	14	31	293	11:00	663
12:10	31	45	273	12:44	48	55	260	**DU**	12:57	34	46	270	12:26	20	38	293	12:00	995
13:00	19	43	265	13:01	39	48	260	**DU**	13:17	38	53	270	13:26	17	34	286	13:00	995
14:00	15	35	261	14:56	31	43	260	**DU**	14:53	31	48	270	14:26	17	37	287	14:00	995
15:30	15	29	258	15:56	30	37	250		15:53	29	43	260	15:26	17	34	268	15:00	205
16:00	18	31	256	16:56	32	37	240		16:53	21	31	250	16:26	16	31	263	16:00	117
17:00	17	38	259	17:56	31	40	250		17:53	18	31	250	17:26	19	38	272	17:00	118
18:20	19	34	262	18:56	30		260		18:53	23	30	250	18:26	14	37	271	18:00	72
19:10	20	35	255	19:56	21		260		19:53	24	39	260	19:26	15	32	246	19:00	64
20:30	20	31	246	20:56	21		260		20:53	17	30	270	20:26	19	33	214	20:00	261
21:20	28	40	239	21:56	14		260		21:53	13	22	280	21:26	16	41	215	21:00	413
22:00	18	34	261	22:56	10		260		22:53	11		270	22:26	15	30	240	22:00	30
23:20	24	37	248	23:56	16		260		23:53	8		270	23:26	14	27	232	23:00	11

Wind data for KIPL and KNJK from the NCEI's QCLCD system. Wind data for the Fish Creek Mountains (FHCC1) and Sunrise-Ocotillo (IMPSD) from the University of Utah's MesoWest. Wind speeds = mph; Direction = degrees. DU = widespread dust

TABLE 3-6
WIND SPEEDS AND PM_{10} CONCENTRATIONS FOR *OCTOBER 20, 2017

	MOUNTAIN SPRINGS GRADE (TNSC1)			EL CENTRO NAF (KNJK)			IMPERIAL CO. AIRPORT (KIPL)			NAVAL TEST BASE			BRLY	CX	EC	NLND	WSTMLD
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} ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)
12:00	27	38	211	9		180	5		VRB	6		70	47	56	49	27	66
13:00	27	39	212	22		250				6		64	49	55	37	50	65
14:00	18	35	235	24	30	260	17		250	6		52	190	64	164	57	85
15:00	24	33	226	25	31	250	17		260	4		18	179	199	133	127	215
16:00	21	38	224	25		250	17		250	13		287	443	272	83	67	76
17:00	29	40	204	25	32	250	17	26	250	19		276	90	84	72	271	139
18:00	28	40	205	21		260	17		250	19		278	56	39	65	208	111
19:00	34	45	205	15		250	16	24	270	15		274	109	62	70	123	70
20:00	31	46	206	22		250	13		270	15		276	132	40	69	241	79
21:00	28	45	211	17		250	15		260	13		277	64	56	100	94	141
22:00	32	46	217	24		260	10		240	14		272	105	651	43	138	111
23:00	29	45	211	16		260	15		260	18		280	178	367	64	65	224
0:00	32	50	214	22		260	15		250	6		276	266	601	33	75	88
1:00	31	51	219	23		250	15		250	14		268	203	840	67	61	273
2:00	29	46	219	22	31	250	20	29	250	17		272	214	653	73	71	64
3:00	38	55	221	36	45	260	26	34	270	17		274	98	266	382	159	150
4:00	31	57	205	36	43	250	33	44	260	25		267	128	331	584	146	209
5:00	25	47	223	32	44	250	28	33	250	17		273	328	77	106	75	139
6:00	29	45	238	34	40	260	26	34	250				935	139	397	127	197
7:00	33	55	239	29	37	250	21	29	260				995	164	296	62	474
8:00	30	49	239	34	43	260	20	30	250	16		280	995	271	128	233	359
9:00	22	46	234	22		250	17	25	250	25		275	612	242	108	567	669
10:00	25	38	247	10		280	8	23	240	29		282	342	126	55	995	533
11:00	14	40	210	33	39	280	24	36	270	28		258	477	118	74	858	663
12:00	34	58	219	48	55	260	34	46	270	25		260	995	800	706	995	995
13:00	36	55	224	39	48	260	38	53	270	34		262		985	843	308	995
14:00	32	55	227	31	43	260	31	48	270	31		257	932	985	216	74	995
15:00	36	51	232	30	37	250	29	43	260	22		255	672	272	99	96	205
16:00	30	52	235	32	37	240	21	31	250	21		250	175	233	68	90	117
17:00	23	46	238	31	40	250	18	31	250	24		262	96	73	86	48	118
18:00	25	45	238	30		260	23	30	250	22		270	92	34	36	67	72
19:00	32	48	235	21		260	24	39	260	25		274	136	86	33	184	64
20:00	38	49	233	21		260	17	30	270	20		271	168	246	47	204	261
21:00	40	56	202	14		260	13	22	280	18		270	337	61	22	115	413
22:00	37	57	203	10		260	11		270	16		273	205	37	21	31	30
23:00	38	56	206	16		260	8		270	17		277	369	26	18	23	11

*Data information in **Blue** refers to October 19, 2017. Wind data for KIPL and KNJK from the NCEI's QCLCD system. Wind data for Mountain Springs Grade (TNSC1) from the University of Utah's MesoWest. Wind data for Naval Test Base from AQMIS2. Wind speeds = mph; Direction = degrees. DU = widespread dust. Due to the different times during the hour that wind and air quality is sampled, the hour given represents the hour in which the measurement was taken, and not necessarily the exact time Wind speeds = mph; Direction = degrees

As mentioned above Area Forecast Discussions and Urgent Weather Messages containing a Wind Advisory or possible blowing dust described the gusty westerly winds for the region extending from the San Diego County mountains and deserts, Imperial County, western Arizona. The strong Pacific trough strengthened the pressure gradient and produced strong gusty westerly winds 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.[17] As transported windblown dust entered Imperial County on October 20, 2017 air quality degraded throughout Imperial County. Overall, the strong winds associated with the strong Pacific trough affected air quality in Imperial County.

FIGURE 3-5
IMPERIAL VALLEY AIR QUALITY INDEX FOR BRAWLEY
OCTOBER 20, 2017

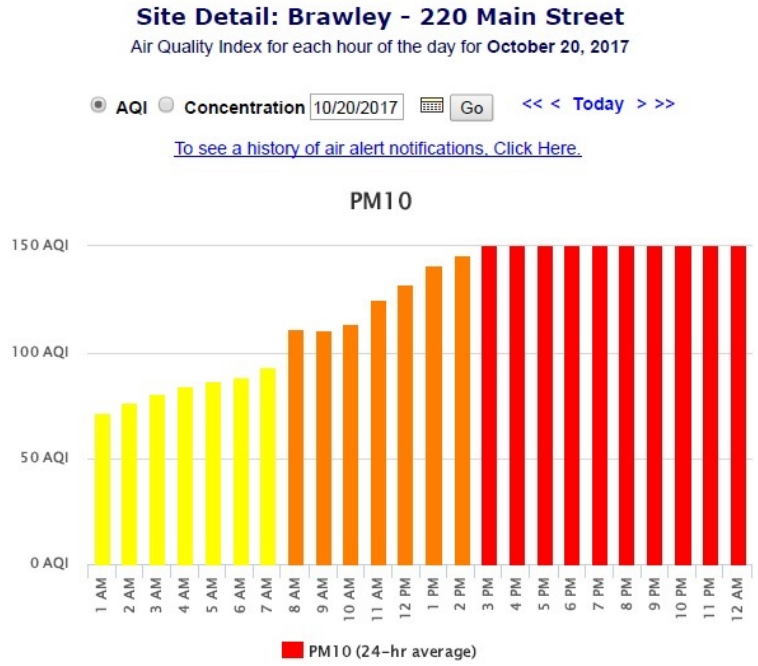


Fig 3-5: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Yellow" or Moderate level to a "Red" or Unhealthy level

[17] 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 3-6
IMPERIAL VALLEY AIR QUALITY INDEX FOR CALEXICO
OCTOBER 20, 2017

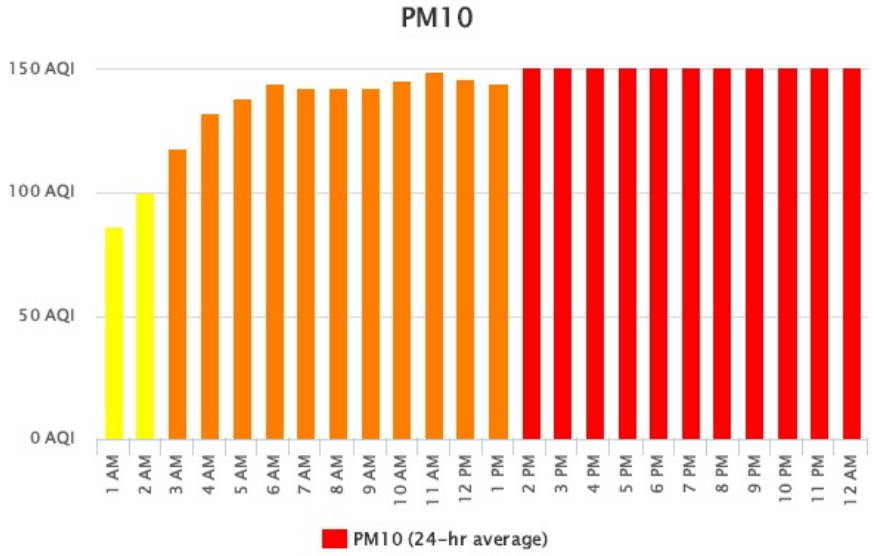


Fig 3-6: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Yellow" or Moderate level to a "Red" or Unhealthy level

FIGURE 3-7
IMPERIAL VALLEY AIR QUALITY INDEX FOR EL CENTRO
OCTOBER 20, 2017

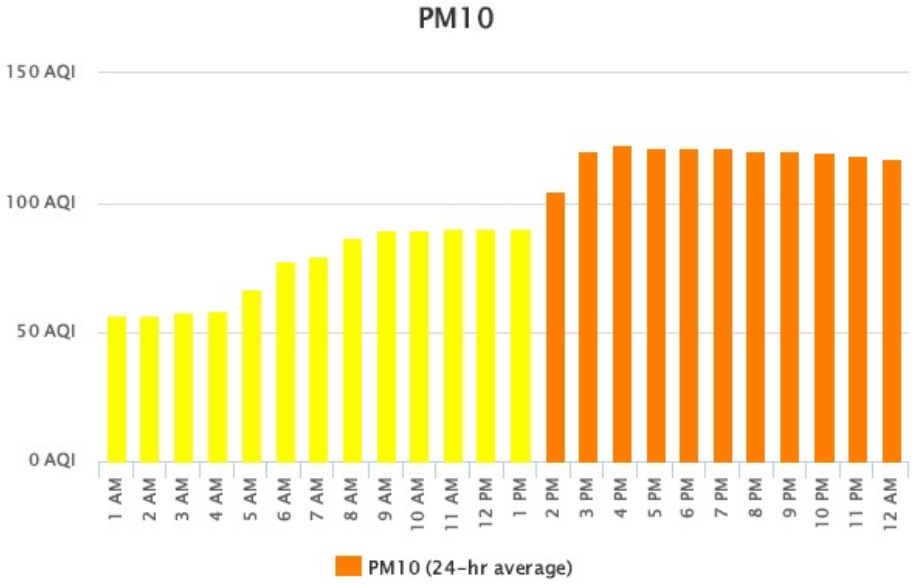


Fig 3-7: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Yellow" or Moderate level to a "Orange" or Unhealthy for Sensitive Groups

FIGURE 3-8
IMPERIAL VALLEY AIR QUALITY INDEX FOR NILAND
OCTOBER 20, 2017

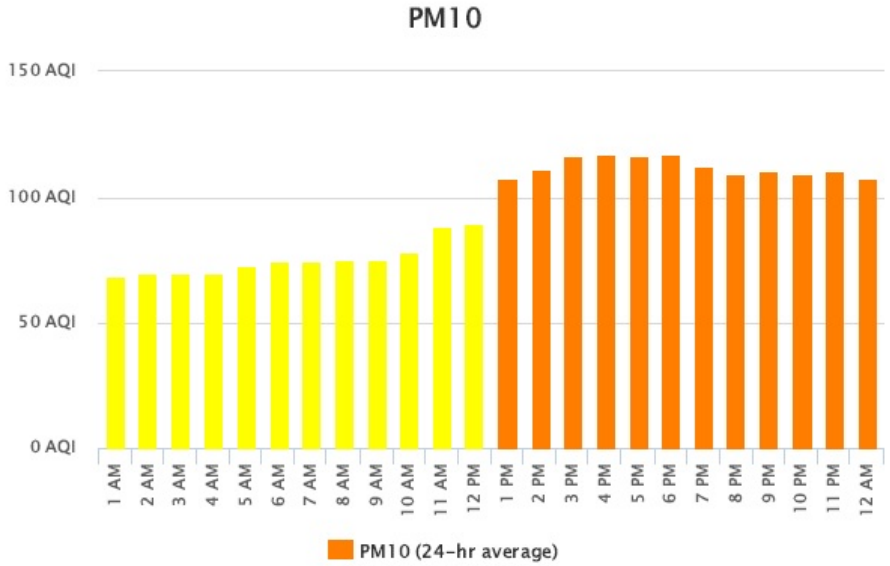


Fig 3-8: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Yellow" or Moderate level to a "Orange" or Unhealthy for Sensitive Groups

FIGURE 3-9
IMPERIAL VALLEY AIR QUALITY INDEX FOR WESTMORLAND
OCTOBER 20, 2017

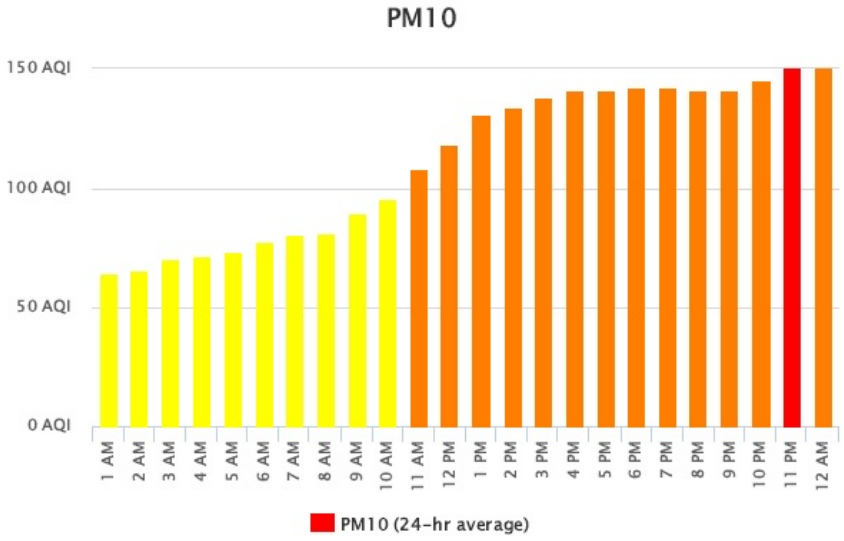


Fig 3-9: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Yellow" or Moderate level to a "Red" or Unhealthy level

III.2 Summary of Forecasts and Warnings

Area Forecast Discussions issued by the NWS offices in Phoenix and San Diego described the shifting to the east of the strong Pacific trough off the Pacific northwest.[18] Both NWS offices issued several Area Forecast Discussions anticipating gusty westerly winds through the region by Friday, October 20, 2017. The magnitude of the winds caused the NWS offices to issue Urgent Weather Message, containing wind advisories and blowing dust advisories. It is interesting to note, that both NWS office updated their aviation in anticipation of the strong gusty westerly winds. In all seven (7) separate Urgent Weather Messages in anticipate of advisory level winds within the San Diego Mountains, adjacent deserts and Imperial County were issued. **Appendix A** contains all pertinent NWS notices.

III.3 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), and Imperial County as well as from other automated meteorological instruments upstream from the Imperial County monitors. Data analysis indicates that on October 20, 2017 different sites measured wind speeds at or above (and some far in excess of) 25 mph.

[18] National Weather Service, Area Forecast Discussion, Oct., 19 2017, San Diego office, 930am PDT

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 at all air quality monitors for the period of January 1, 2010 through October 20, 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).[19] 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 October 20, 2017, as measured by the Brawley, Calexico, El Centro, Niland and Westmorland monitors, were used to establish the historical and seasonal variability over time.[20] All figures illustrate that the exceedance, which occurred on October 20, 2017, was 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.

[19] 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 760torr and 25C). 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.

[20] FRM sampling ended December 2016.

FIGURE 4-1
BRAWLEY HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO OCTOBER 20, 2017

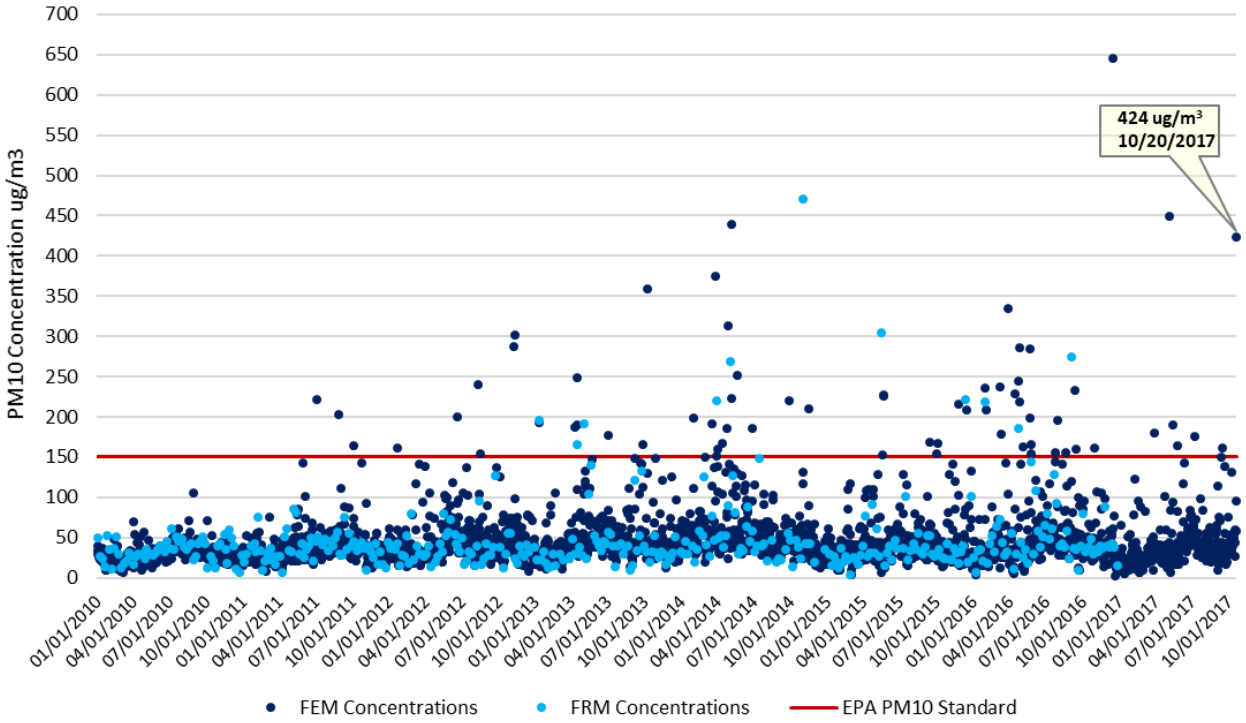


Fig 4-1: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 424 µg/m^3 on October 20, 2017 by the Brawley monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-1,** for Brawley included 2,850 sampling days (January 1, 2010 through October 20, 2017). Of the 2,850 sampling days the Brawley monitor measured 67 exceedance days which translates into an occurrence rate less than 2.5%. Historically, there were twelve (12) exceedance days measured during the first quarter, twenty-seven (27) exceedance days measured during the second quarter, sixteen (16) exceedance days measured during the third quarter; and twelve (12) 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 OCTOBER 20, 2017

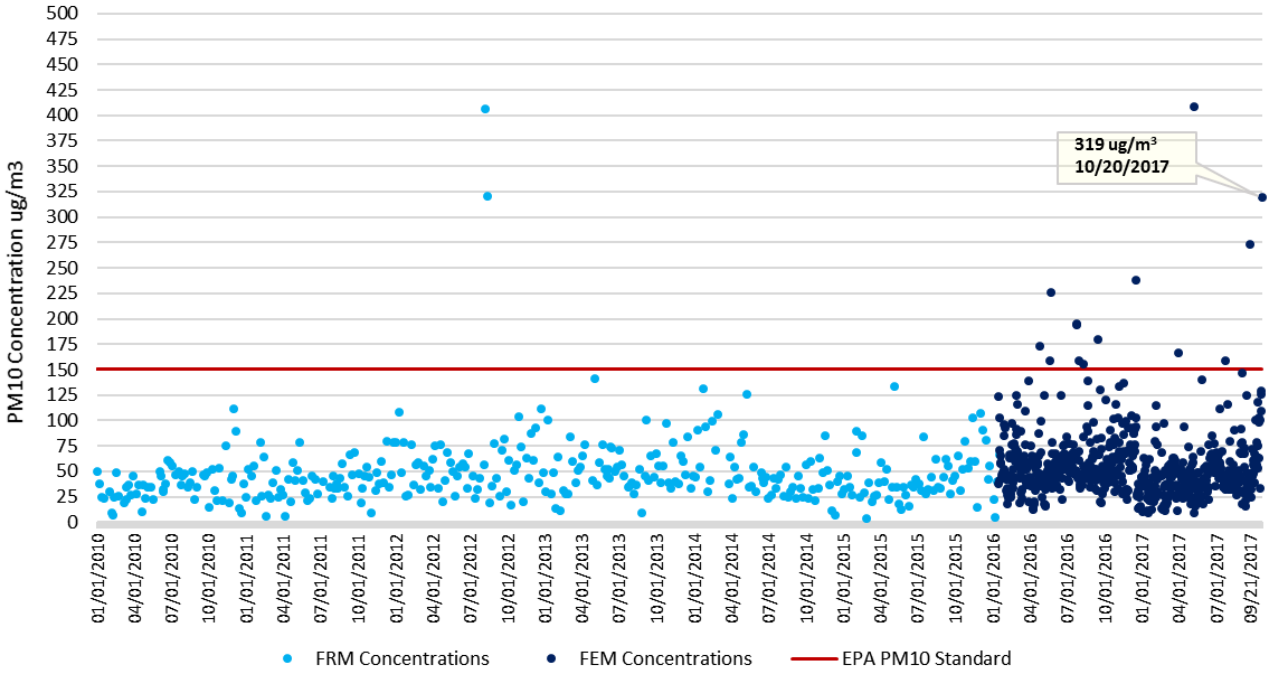


Fig 4-2: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 319 µg/m^3 on October 20, 2017 by the Calexico monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-2,** for Calexico included 1,059 sampling days (January 1, 2010 through October 20, 2017). Of the 1,059 sampling days the Calexico monitor measured 16 exceedance days which translates into an occurrence rate less than 2%. Historically, there was one (1) exceedance day measured during the first quarter, four (4) exceedance days measured during the second quarter, nine (9) exceedance days measured during the third quarter; and two (1) 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 OCTOBER 20, 2017

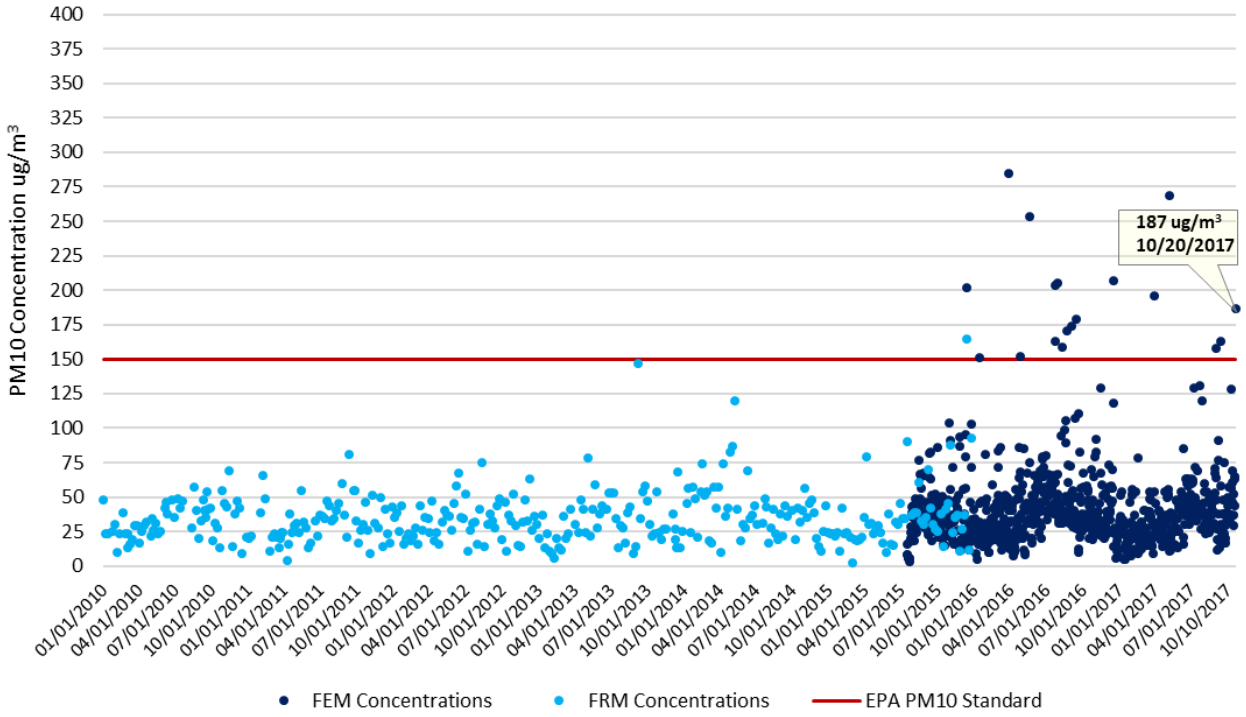


Fig 4-3: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 187 µg/m^3 on October 20, 2017 by the El Centro monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-3,** for El Centro included 1,187 sampling days (January 1, 2010 through October 20, 2017). Of the 1,187 sampling days the El Centro monitor measured 16 exceedance days which translates into an occurrence rate less than 2%. Historically, there were two (2) exceedance day measured during the first quarter, two (2) exceedance days measured during the second quarter, nine (9) exceedance days measured during the third quarter; and three (3) 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 OCTOBER 20, 2017

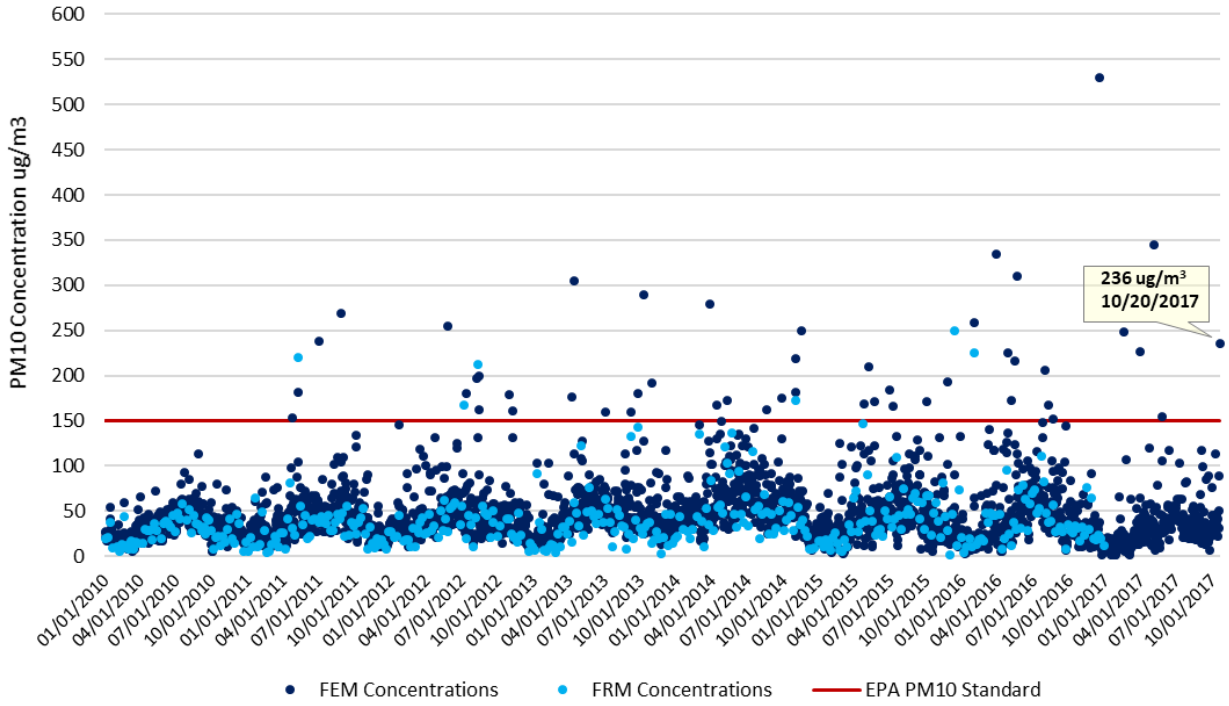


Fig 4-4: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 236 µg/m^3 on October 20, 2017 by the Niland monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-4,** for Niland included 2,850 sampling days (January 1, 2010 through October 20, 2017). Of the 2,850 sampling days the Niland monitor measured 50 exceedance days which translates into an occurrence rate less than 2%. Historically, there were five (5) exceedance day measured during the first quarter, eighteen (18) exceedance days measured during the second quarter, fifteen (15) exceedance days measured during the third quarter; and twelve (2) 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 OCTOBER 20, 2017

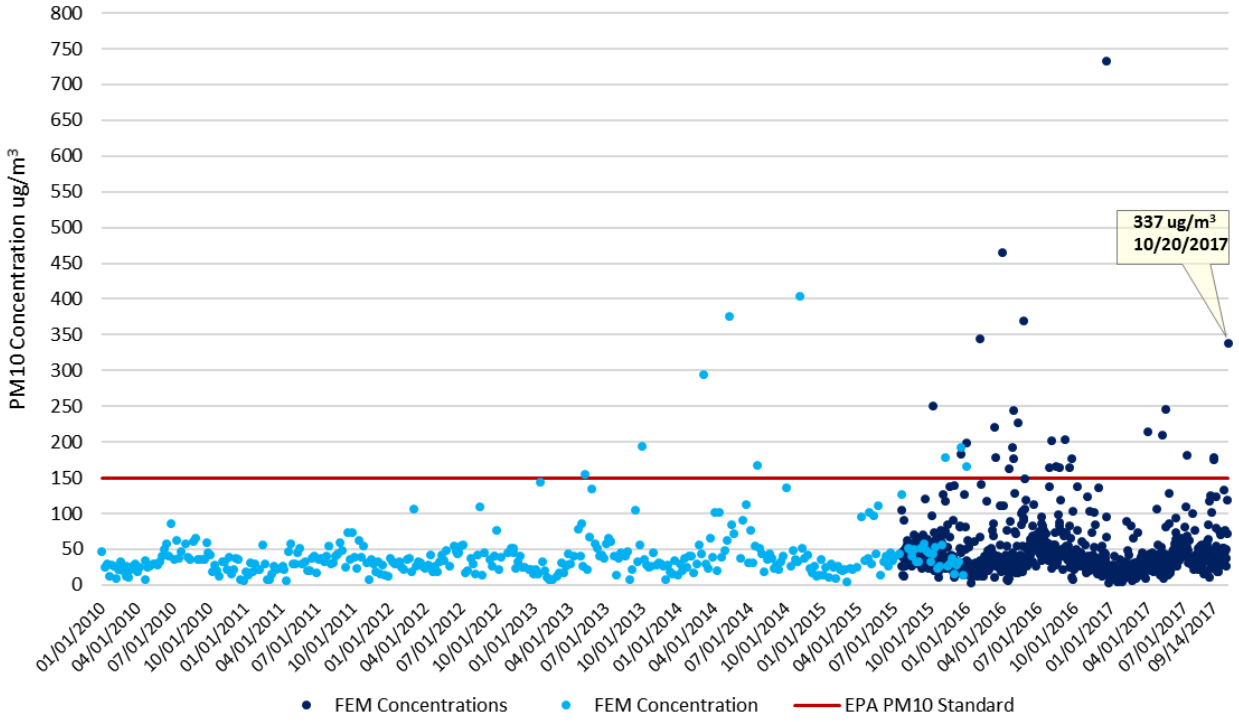
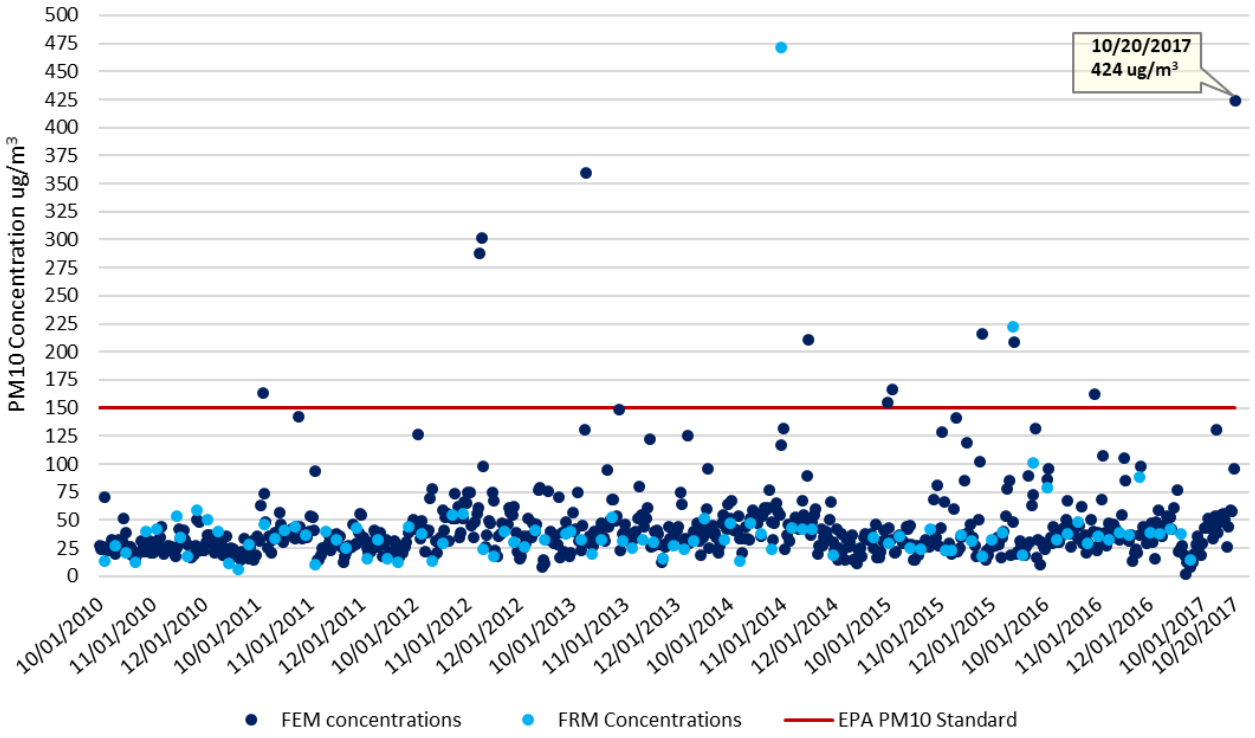


Fig 4-5: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 337 µg/m^3 on October 20, 2017 by the Westmorland monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-5,** for Westmorland included 1,178 sampling days (January 1, 2010 through October 20, 2017). Of the 1,178 sampling days the Westmorland monitor measured 35 exceedance days which translates into an occurrence rate less than 2%. Historically, there were six (6) exceedance day measured during the first quarter, ten (10) exceedance days measured during the second quarter, twelve (12) exceedance days measured during the third quarter; and seven (7) exceedance days measured during the fourth quarter

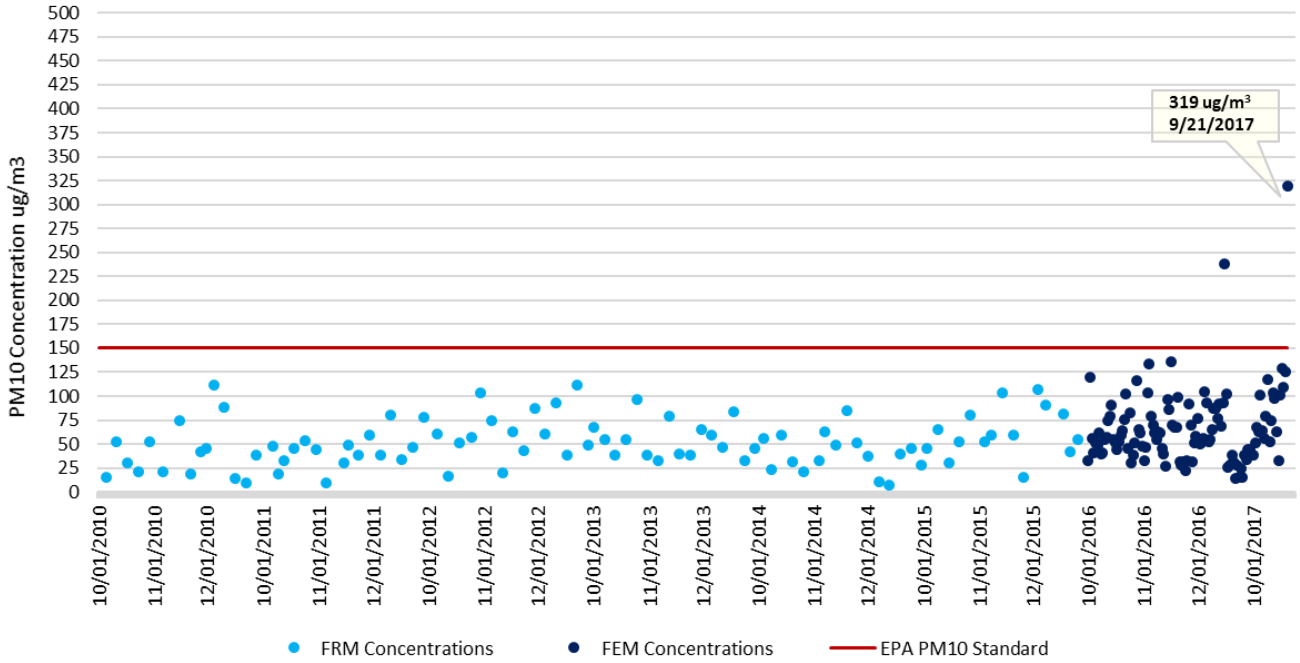
FIGURE 4-6
BRAWLEY SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***OCTOBER 1, 2010 TO OCTOBER 20, 2017**



*** Quarterly: October 1, 2010 to December 31, 2016 and October 1, 2017 to October 20, 2017**
Fig 4-6: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 424 µg/m^3 on October 20, 2017 by the Brawley monitor was outside the seasonal concentrations when compared to similar event days and non-event days

Figure 4-6 illustrates the seasonal fluctuations over a period of 664 sampling days, 763 credible samples and nine (9) 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
***OCTOBER 1, 2010 TO OCTOBER 20, 2017**

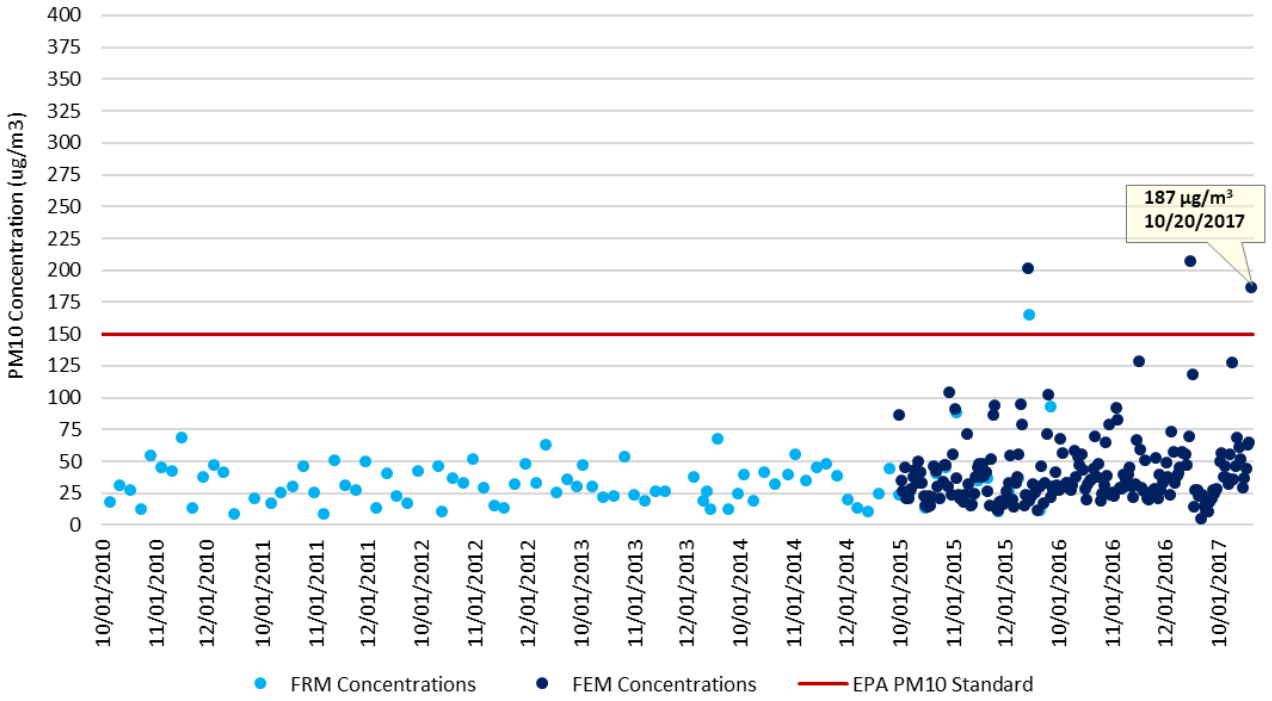


*** Quarterly: October 1, 2010 to December 31, 2016 and October 1, 2017 to October 20, 2017**

Fig 4-7: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 273 µg/m^3 on October 20, 2017 by the Calexico monitor was outside the seasonal concentrations when compared to similar event days and non-event days

Figure 4-7 illustrates the seasonal fluctuations over a period of 215 sampling days, 2015 credible samples and two (2) exceedance days. This translates to less than a 2% seasonal exceedance occurrence rate.

FIGURE 4-8
EL CENTRO SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***OCTOBER 1, 2010 TO OCTOBER 20, 2017**

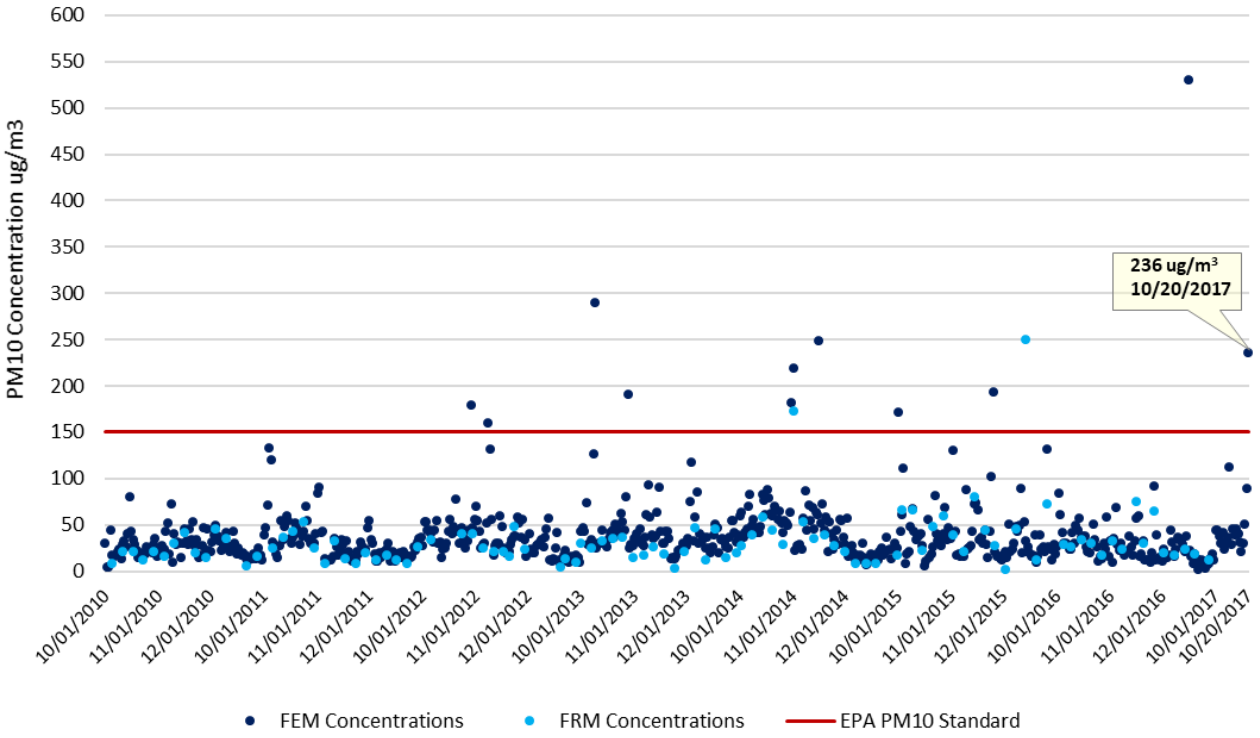


*** Quarterly: October 1, 2010 to December 31, 2016 and October 1, 2017 to October 20, 2017**

Fig 4-8: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 187 µg/m^3 on October 20, 2017 by the El Centro monitor was outside the seasonal concentrations when compared to similar event days and non-event days

Figure 4-8 illustrates the seasonal fluctuations over a period of 286 sampling days, 293 credible samples and three (3) exceedance days. This translates to less than a 1% seasonal exceedance occurrence rate.

FIGURE 4-9
NILAND SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
OCTOBER 1, 2010 T0 OCTOBER 20, 2017

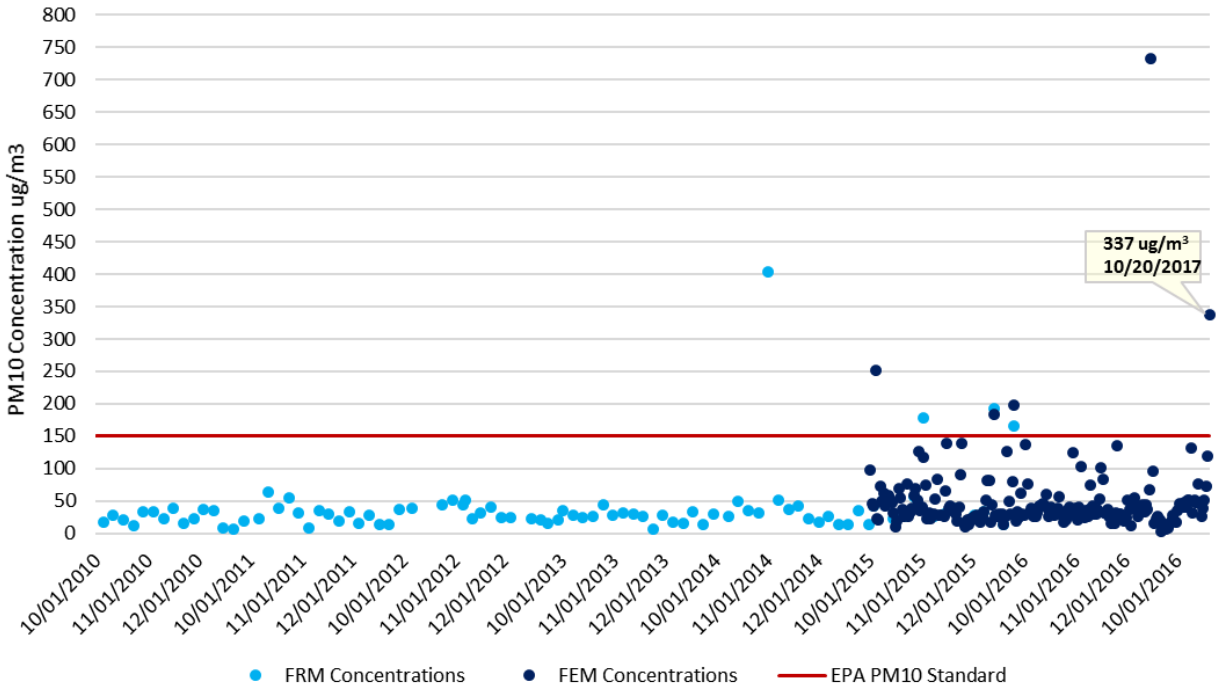


*** Quarterly: October 1, 2010 to December 31, 2016 and October 1, 2017 to October 20, 2017**

Fig 4-9: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 236 µg/m^3 on October 20, 2017 by the Niland monitor was outside the seasonal concentrations when compared to similar event days and non-event days

Figure 4-9 illustrates the seasonal fluctuations over a period of 664 sampling days, 766 credible samples and twelve (12) exceedance days. This translates to less than a 2% seasonal exceedance occurrence rate.

FIGURE 4-10
WESTMORLAND SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***OCTOBER 1, 2010 TO OCTOBER 20, 2017**



*** Quarterly: October 1, 2010 to December 31, 2016 and October 1, 2017 to October 20, 2017**
Fig 4-10: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 337 µg/m^3 on October 20, 2017 by the Westmorland monitor was outside the seasonal concentrations when compared to similar event days and non-event days

Figure 4-10 illustrates the seasonal fluctuations over a period of 283 sampling days, 294 credible samples and seven (7) 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 October 20, 2017 measured exceedances, the exceedances measured on October 20, 2017 are 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 within the natural open areas of the San Diego Mountains and the natural open deserts to the west and northwest of Imperial County. The origination of these emissions from these areas affected all the air quality monitors significantly on October 20, 2017. Since Imperial County does not have jurisdiction over emissions emanating from San Diego County, it is not reasonably controllable or preventable by Imperial County.

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

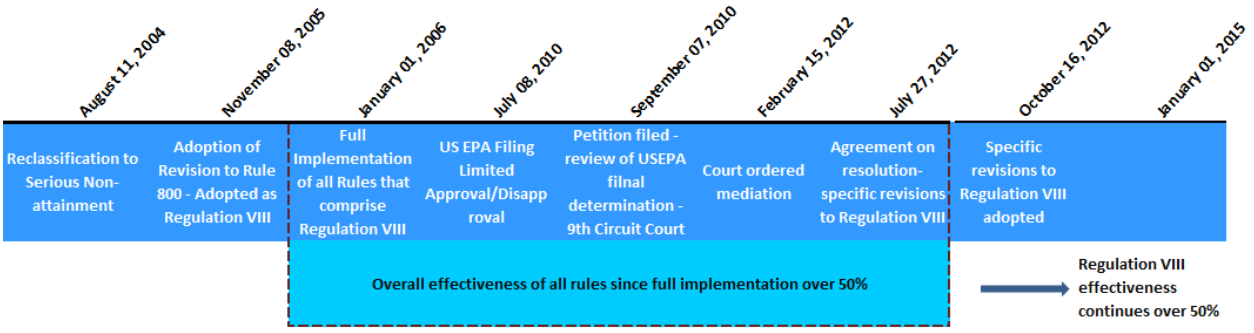


Fig 5-1: Regulation VIII Graphic Timeline

V.1 Wind Observations

As previously discussed, wind data analysis indicates that on October 20, 2017 different sites measured wind speeds at or above (in some instances far in excess of) 25 mph. Wind speeds of 25 mph are normally sufficient to overcome most PM_{10} control measures. During the October 20, 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 Brawley, Calexico, El Centro, Niland, and Westmorland during the October 20, 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. No complaints were filed on October 20, 2017, officially declared as a No Burn day, related to agricultural burning, waste burning or dust. There was however, a river water bottom "wood chips" fire. Smoke from a river bottom located near Forrester and Keystone roads was reported to the ICAPCD at 307 pm on October 20, 2017. At the time of the complaint, PM_{10} levels at nearly all monitors were beginning to moderate. Being that the location was only marginally upstream of the two closest stations, Brawley and Westmorland, and that peak PM_{10} concentrations had been measured earlier in the day, the smoke played no impact on the exceedance.

FIGURE 5-2
PERMITTED SOURCES

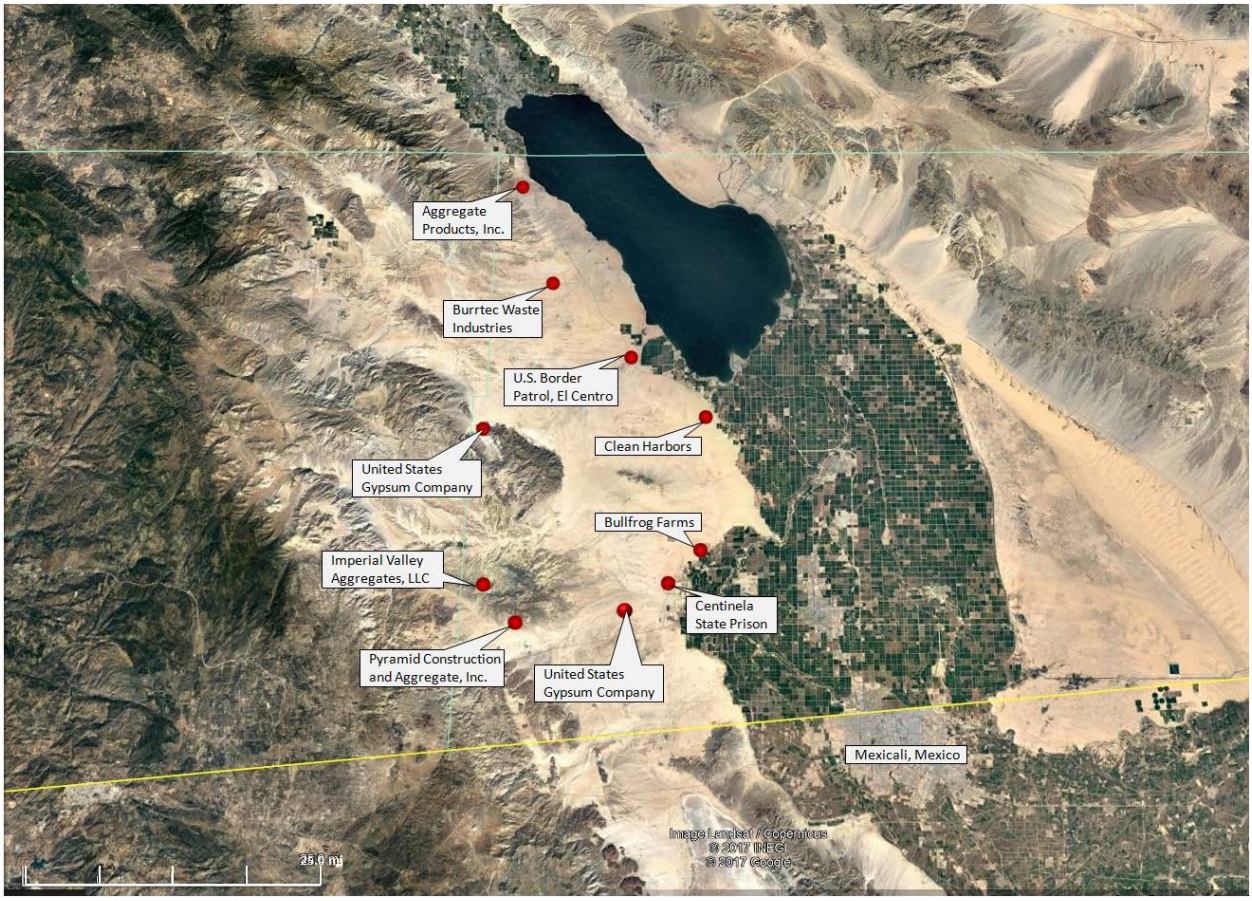


Fig 5-2: The above map identifies those permitted sources located west, northwest and southwest of all the air quality monitors. The green line to the north denotes the political division between Imperial and Riverside counties. The yellow line below denotes the international border between the United 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

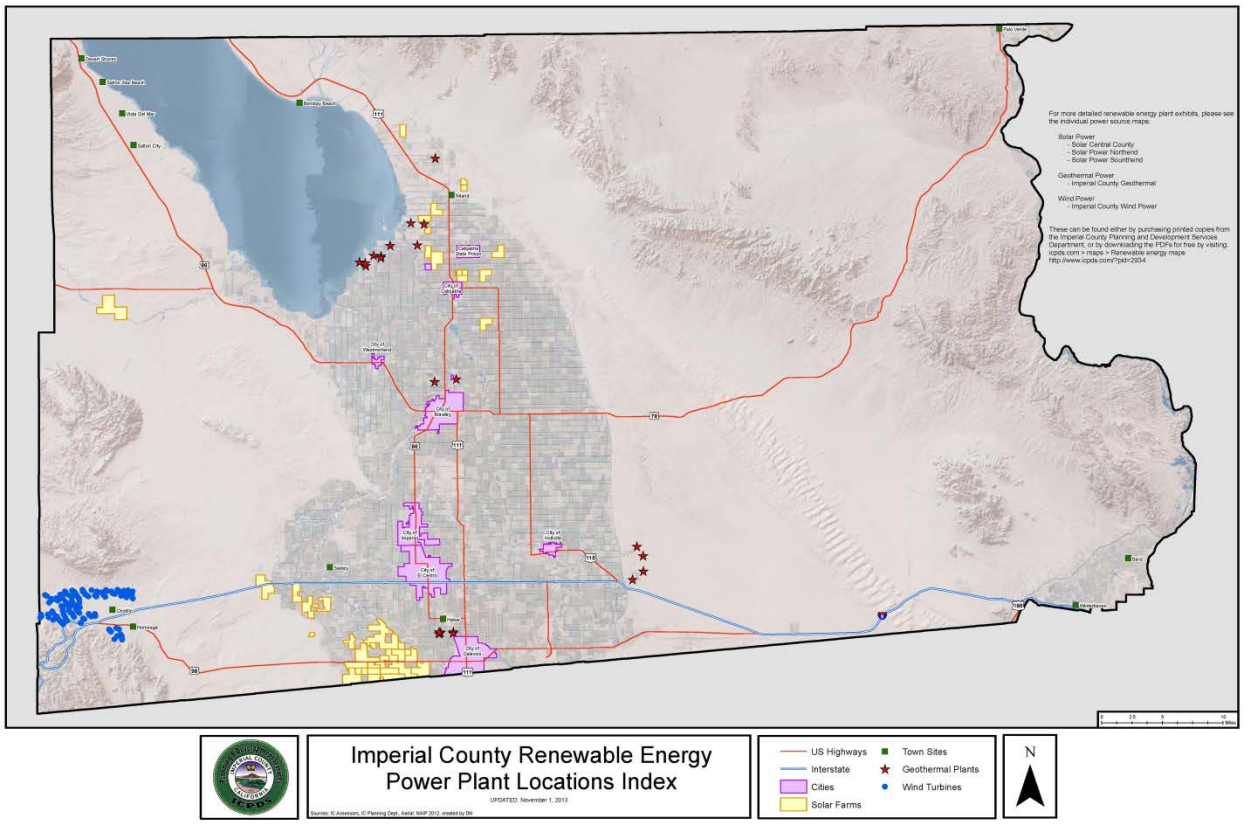


Fig 5-3: The above map identifies those power sources located west, northwest and southwest of the Brawley, Calexico, El Centro, Niland, and Westmorland monitors. Blue indicate the Wind Turbines, Yellow are the solar farms and stars are geothermal plants

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, Pacific weather disturbances during this time of year will bring westerly winds. The strong gusty westerly winds on October 20, 2017 resulted from what the NWS identified as a strong but largely dry strong Pacific trough that strengthened the onshore surface pressure gradient and generated strong gusty westerly winds across the region from southern and southeastern California to western Arizona. Strong gusty westerly winds blew through the region and were of a magnitude that prompted the NWS offices in San Diego and Phoenix to issue seven (7) separate Urgent Weather Messages. Strong gusty westerly winds blew over and through the San Diego Mountains generating and transporting dust emissions down slopes onto the open natural desert floor west of Imperial County.

Strong gusty westerly winds blew over the San Diego mountains, through slopes down into the natural open desert floor transporting dust onto the air quality monitors in Westmorland, Brawley, Niland, El Centro and Calexico. As the system moved further east, winds reduced along with measured concentrations. Finally, the intensity of the gusty westerly winds was sufficient to overcome BACM in place, in Imperial County

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 October 20, 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

San Diego 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} exceedance 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 of Imperial County. These facts provide strong evidence that the PM_{10} exceedance at the Brawley, Calexico, El Centro, Niland and Westmorland monitors on October 20, 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 Brawley, Calexico, El Centro, Niland, and Westmorland on October 20, 2017, was caused by the transport of windblown dust into Imperial County by strong southerly winds associated with a storm 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 October 20, 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 October 20, 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 that preceded the identified cold front associated with the unseasonably deep trough as it passed through the southern region of California. The information provides a clear causal relationship between the entrained windblown dust and the PM_{10} exceedance measured at all the air quality monitors in Imperial County on October 20, 2017.

In particular, the clear causal relationship and not reasonably controllable or preventable sections provide evidence that high gusty westerly winds transported fugitive emissions from open natural Mountain and desert areas, located within the San Diego County and Imperial County (all part of the Sonoran Desert). In addition, because anthropogenic sources in upwind areas were reasonably controlled at the time of the event, this event meets the definition of a Natural Event.[21]

[21] 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.