IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

Mountain Springs Grade, 1913, ©SDHC #16-408
http://sandiegohistory.org/wp-content/uploads/2016/05/V62_1Streetman.pdf

May 25, 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 monitor in Brawley, California on May 25, 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. 24
4	A demonstration that the event was both not reasonably controllable and not reasonably preventable	Pg. 27
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. 32

[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 May 25, 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. Unfortunately, as of the writing of this documentation, due to ransomware, random archival files were deleted in order to protect the integrity of the network system. May, June and July files have been effectively deleted as infected files.

In any event, both the San Diego and Phoenix NWS offices posted notices as early as May 22, 2017 of gusty surface winds, west to southwesterly and potentially some patchy blowing dust Wednesday, May 24, 2017 through Thursday, May 25, 2017. If available, **Appendix C** contains copies of notices pertinent to the May 25, 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 May 25, 2017, a naturally occurring event elevated particulate matter within San Diego, Riverside and Imperial Counties, causing an exceedance at the Brawley monitor (06-025-0007). 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 monitor on May 25, 2017. After review, CARB submitted the INPEE for the May 25, 2017 event in July of 2017. The submitted request included a brief description of the meteorological conditions for May 25, 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 May 25, 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 concentration of 164 µg/m^3 measured by the Brawley monitor on May 25, 2017.

(B) Concurrently with the Public Review period for the May 25, 2017 exceptional event, the ICAPCD is formally submitting to CARB for remittance to USEPA the Draft May 25, 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

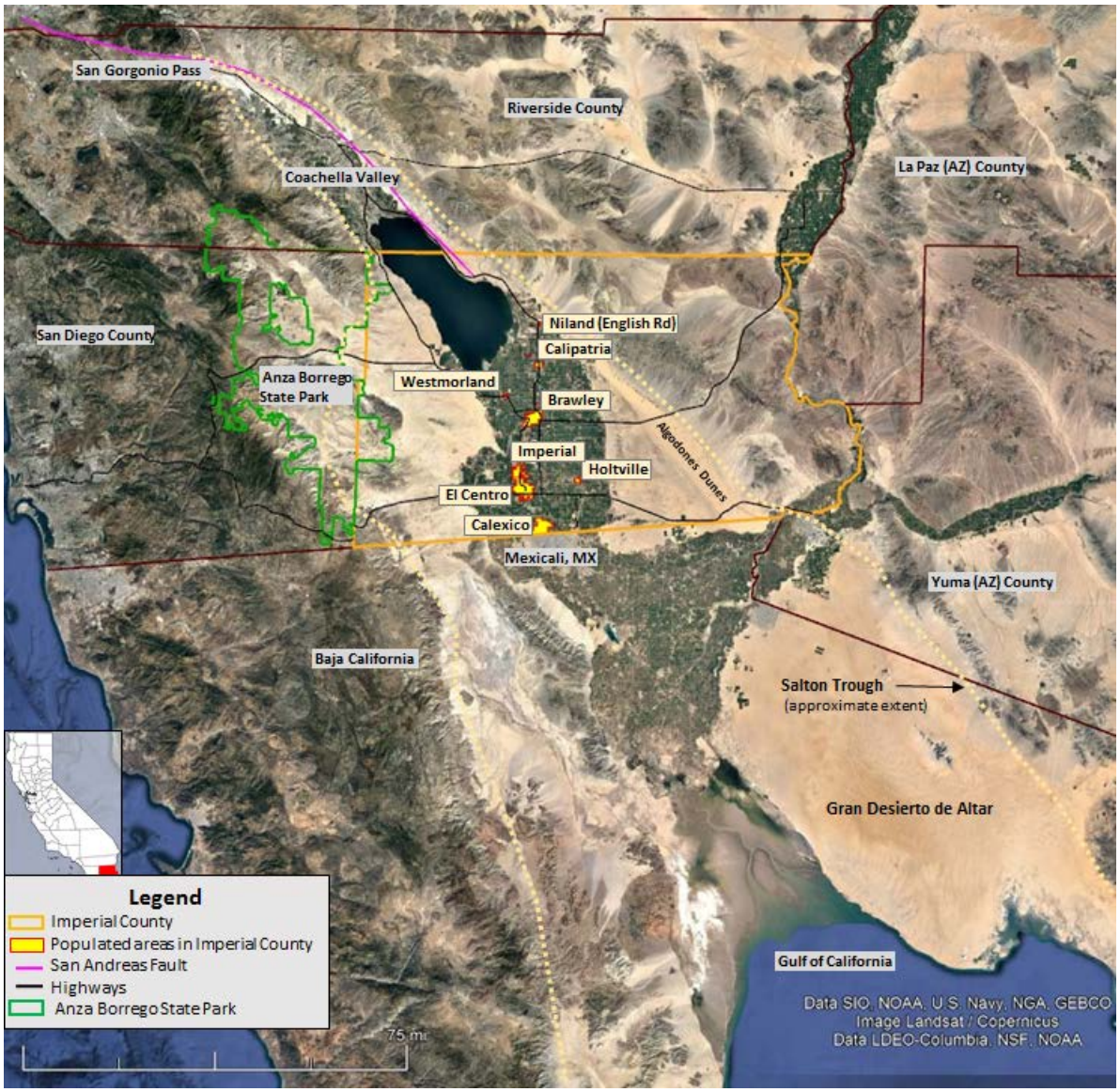

Fig 1-1: Imperial County a Southern California border region, within far southeast California bordering Arizona and Mexico has a small most economically diverse region with a population of 174,528

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

Both National Weather Service (NWS) offices, located in San Diego and Phoenix discussed wind advisory level gusty winds for Thursday, May 25, 2017 and Friday, May 26, 2017 as early as Monday, May 22, 2017. In fact, between the two offices there were eleven (11) Urgent Weather Messages issued for wind advisory level winds within the San Diego Mountains, deserts and Imperial County.

The event, best described by the San Diego office in various area discussions, was a shortwave trough whose features included a cooling trend; a rapid deepening of the marine layer, producing light sprinkles and drizzle; and as the high-pressure ridge moved to the east, a drawing of the sub-tropical jet across southern California into the southwest. The jet winds with surface winds, arriving late Wednesday, May 24, 2017 into Thursday, May 25, 2017, rose to the level of advisory conditions.[4] Both NWS offices issued wind advisories on May 24, 2017.[5] In addition, to the above, the San Diego office described that in addition to the shortwave trough offshore of Point Conception there was a deeper, stronger trough over the Inter-Mountain west. Although the San Diego office expected winds to lessen slightly the stronger winds would develop later during the evening hours of May 25, 2017 as the shortwave moved through Southern California. There is an interesting note to make here, while the San Diego NWS office does not forecast for Imperial County, the office did mention an affect to Imperial County in one of its area forecast discussions.[6]

By Thursday, May 25, 2017, the Phoenix NWS office described a "*complex flow pattern over western North America and the northeast Pacific. In general there is troughing centered near the coast but with 3 distinct systems embedded*."[7] According to the Phoenix office the combination of the height falls and the upper jet proximity (over Baja California), developed gusty winds which would persist and expand along and west of the Colorado River, into the lower deserts with reduced visibility and affecting air quality along dust prone areas.[8]

[4] National Weather Service, San Diego Office, Area Forecast Discussion, May 23, 2017, 247am PDT
[5] National Weather Service, San Diego Office, Urgent Weather Message, May 24, 2017, 232am PDT; Phoenix Office, Urgent Weather Message, May 24, 2017, 242pm MST
[6] National Weather Service, San Diego Office, May 25, 2017; 246am PDT
[7] National Weather Service, Phoenix Office, Area Forecast Discussion, May 25, 2017, 216am MST
[8] *Id.*

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

On May 25, 2017, the air monitors in Imperial and Riverside counties measured elevated concentrations of particulate matter when a shortwave trough which brought a cooling trend, light rain and drizzle and with an enhancement of the jet winds, brought high winds across southern California and western Arizona. These strong gusty westerly winds blew over and through the mountains of San Diego County, generating and transporting dust, onto the open natural deserts of Imperial County affecting air quality. Although monitors, within Riverside and Imperial counties, measured elevated hourly concentrations above 100 µg/m^3, because of sufficient moisture levels within the San Diego Mountains, the only monitor to exceed was the Brawley monitor. (**Table 2-1**).

FIGURE 2-1
MONITORING AND METEOROLOGICAL SITES

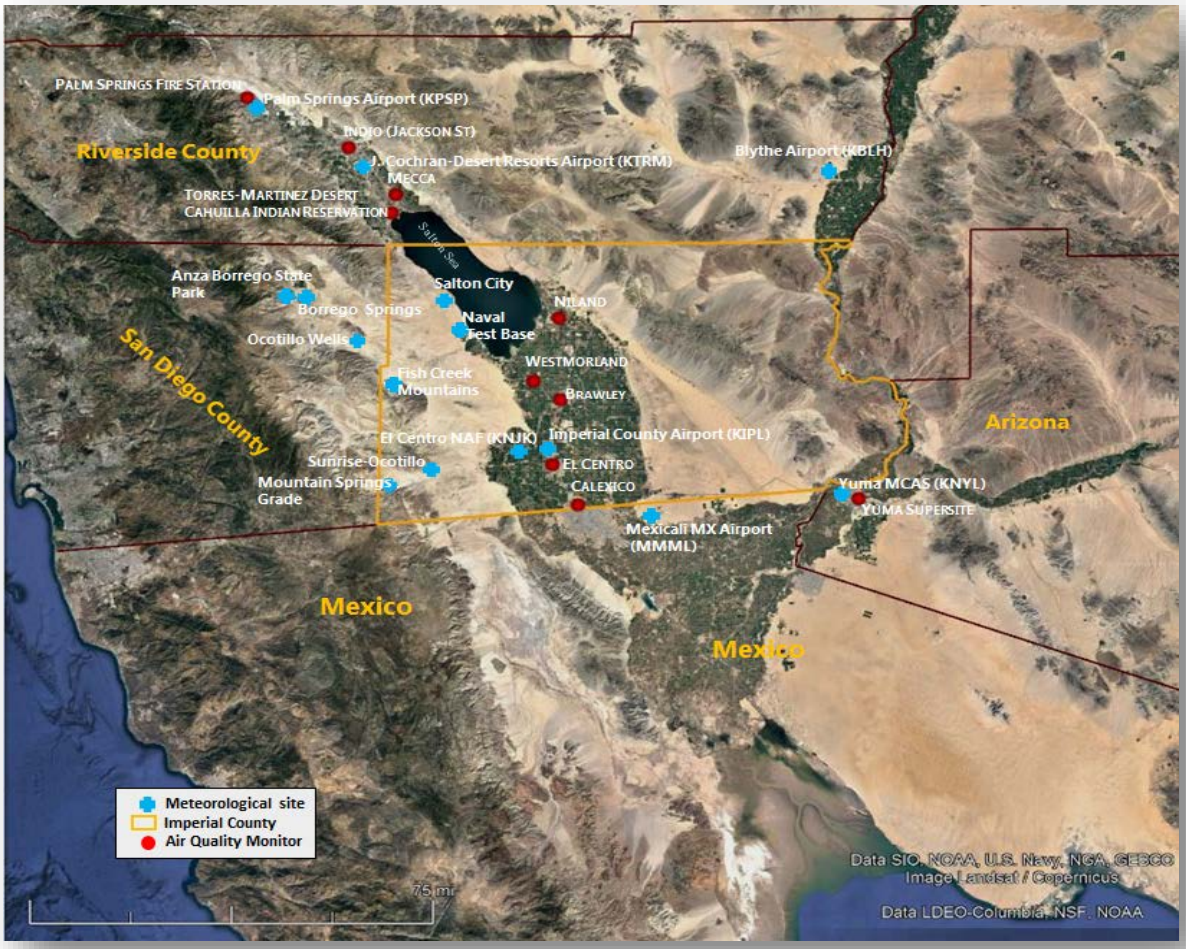

Fig 2-1: Includes a general location of the sites used in this analysis. The site furthest south is in Mexicali, Mexico and the site furthest north is the Palm Springs Fire Station

TABLE 2-1
HOURLY CONCENTRATIONS OF PARTICULATE MATTER

		000	100	200	:00	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	20170524	25	35	23	12	20	30	16	21	25	53	42	33	35	22	28	53	37	28	18	22	22	43	31	29	53	29
	20170525	49	56	58	54	58	61	89	109	56	76	59	63	51	35	46	39	89	72	58	74	121	62	45	32	121	63
	20170526	30	22	19	26	18	16	18	22	22	27	27	19	22	20	22	21	23	24	33	42	27	37	16	13	42	23
INDIO	20170524	31	46	37	35	35	25	30	31	26	24	17	23	13	27	41	64	73	85	70	62	50	33	47	45	85	40
	20170525	62	70	18	37	78	151	128	102	98	85	83	83	81	82	100	109	167	122	118	90	84	119	128	139	167	97
	20170526	153	77	77	64	68	48	87	96	60	48	58	44	28	31	28	31	35	48	71	61	46	31	18	15	153	55
MECCA	20170524	55	54	37	103	118	307	89	45	46	72	34	20	19	42	19	93	102	102	96	120	65	42	40	68	307	74
	20170525	58	73	56	30	75	122	197	195	143	91	45	74	32	49	98	138	161	310	551	173	165	97	110	148	551	132
	20170526	223	279	253	185	140	96	96	134	74	62	50	53	62	50	35	38	36	37	58	58	65	67	54	34	279	93
TORRES-MARTINEZ	20170524	40	83	51	43	69	114	44	91	79	48	37	27	41	49	45	44	95	87	273	405	166	63	148	117	405	94
	20170525	109	84	87	76	93	105	233	191	138	118	108	83	48	76	89	81	173	211	246	137	101	100	113	119	246	121
	20170526	143	300	185	93	110	170	82	86	99	78	53	41	32	40	55	61	61	52	61	47	47	31	34	37	300	83
NILAND	20170524	30	32	28	37	38	54	43	129	56	63	24	15	21	28	29	700	525	211	162	116	125	27	24	28	700	106
	20170525	26	34	43	58	50	53	59	83	72	50	44	36	47	146	75	152	374	393	333	328	269	295	322	376	393	154
	20170526	306	185	95	61	42	48	39	56	23	14	12	10	12	14	20	20	20	12	16	16	34	13	13	10	306	45
WESTMORLAND	20170524	16	12	11	26	20	99	45	33	31	31	42	41	51	84	382	290	178	107	325	98	48	16	26	35	382	85
	20170525	36	60	32	7	40	49	68	55	63	52	24	78	100	251	253	217	386	273	242	237	78	156	173	161	386	128
	20170526	332	92	43	15	26	28	27	34	19	11	12	7	16	12	13	19	26	17	29	35	21	16	7	23	332	36
BRAWLEY	20170524	14	10	11	16	26	69	78	50	42	23	42	48	30	70	173	311	297	124	164	203	87	30	54	17	311	82
	20170525	13	13	34	36	19	17	30	40	46	50	34	42	47	178	440	276	465	995	413	195	89	242	48	174	995	164
	20170526	368	85	63	49	25	38	31	40	26	17	14	21	28	21	21	21	24	51	42	20	15	11	12	13	368	44
EL CENTRO	20170524	16	7	17	16	14	29	31	52	24	36	62	54	39	48	69	113	107	77	55	40	123	54	44	36	123	48
	20170525	29	39	16	10	16	15	29	64	77	29	52	56	46	35	51	69	102	78	60	69	68	36	34	59	102	47
	20170526	71	40	49	34	18	14	23	18	35	81	56	57	52	30	15		21	30	24	21	34	26	16	23	81	34
CALEXICO	20170524	20	26	11	17	19	43	77	102	80	74	51	40	31	33	297	230	103	75	68	107	59	34	42	52	297	70
	20170525	33	42	28	16	24	54	42	124	64	41	52	37	37	68	378	248	318	390	270	575	285	152	57	31	575	140
	20170526	33	49	57	38	32	63	34	35	46	46	62	55	53	49	44	43	32	26	47	28	33	32	26	23	63	41
YUMA SUPERSITE (MST)	20170523	31	22	22	34	28	52	91	33	58	91	50	51	30	22	27	27	28	20	25	30	39	62	61	52	91	41
	20170524	48	42	44	28	33	51	34		42	47	42	35	39	18	13	18	14	20	77	129	68	38	56	97	129	44
	20170525	67	39	58	48	53	62	64	62	44	42	38	30	30	38	20	57	64	78	50	85	62	47	64	53	85	52
	20170526	35	38	52	153	147	179	160	130	78	47	40	34	35	34	36	33	36	48	63	61	52	20	22	13	179	64
	20170527	16	18	17	12	17	29	51	30	17	13	14	11	7	14	12	18	17	24	31	53	67	55	53	52	67	27
YUMA SUPERSITE (PST)	20170524	42	44	28	33	51	34		42	47	42	35	39	18	13	18	14	20	77	129	68	38	56	97	67	129	45
	20170525	39	58	48	53	62	64	62	44	42	38	30	30	38	20	57	64	78	50	85	62	47	64	53	35	85	50
	20170526	38	52	153	147	179	160	130	78	47	40	34	35	34	36	33	36	48	63	61	52	20	22	13	16	179	63

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

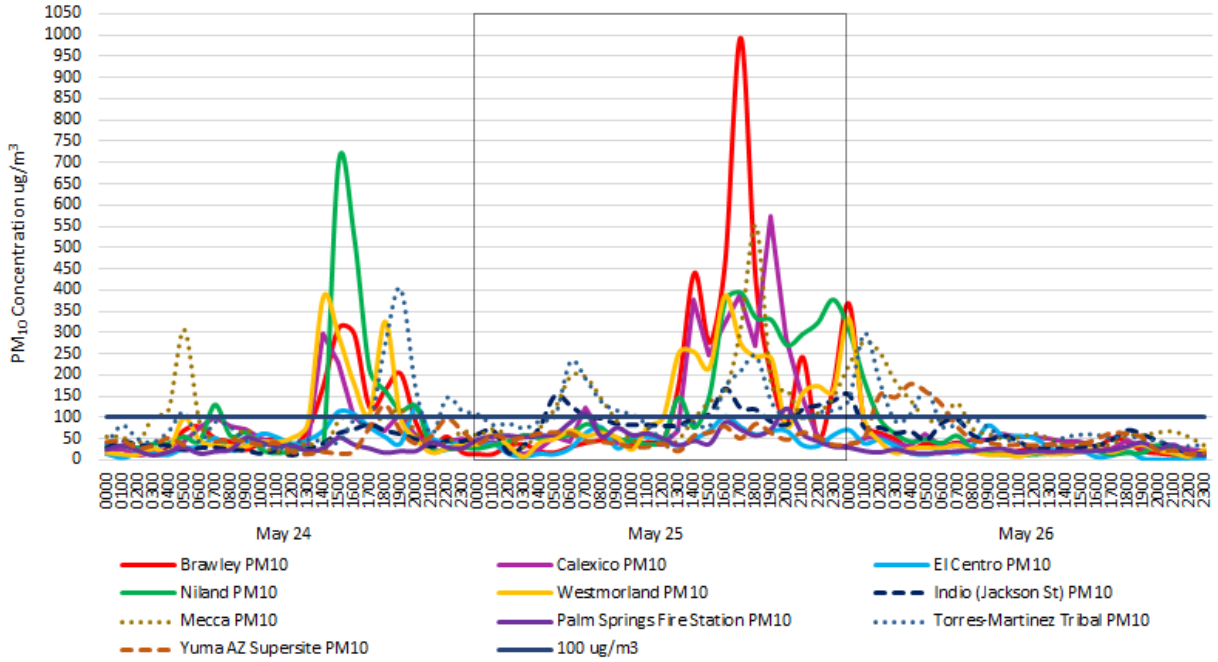

Fig 2-2: is a three-day graphical representation of the PM_{10} concentrations measured at the sites identified in **Table 2-1.** Note the number of hours from various sites measuring above 100 µg/m^3

Wind speed, wind direction and the airflow patterns combined all help explain how windblown emissions, resulting from winds, associated with the passing of a low-pressure system, affected the Brawley monitor on Thursday, May 25, 2017.

As mentioned above, both the San Diego and Phoenix NWS offices described the passing of a shortwave trough with associated advisory level winds into the southwest. The weather system included a cooling trend, isolated showers and surface high winds. As a result, combined, eleven (11) separate Urgent Weather Messages were issued by either the San Diego or Phoenix NWS offices identifying among other areas, the San Diego Mountains, San Diego deserts (Anza Borrego), and Imperial County (**Appendix A**).

Finally, both the San Diego office, and the Phoenix office issued Weather Stories, containing a synopsis of the effects resulting from the trough of low-pressure as it moved through the region. These Weather Stories advised of cooler weather, scattered light showers, gusty westerly winds, and reduced visibility due to blowing sand and dust all of which affected the San Diego Mountains, deserts and the western portion of Imperial County through Friday, May 26, 2017.

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Figures 2-3 and 2-4 depict the compiled wind data for regional and neighboring airports and upwind 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. Sites farther southwest of Imperial County measured elevated wind speeds much sooner than sites further west or within urbanized centers, coincident with measured elevated concentrations.

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

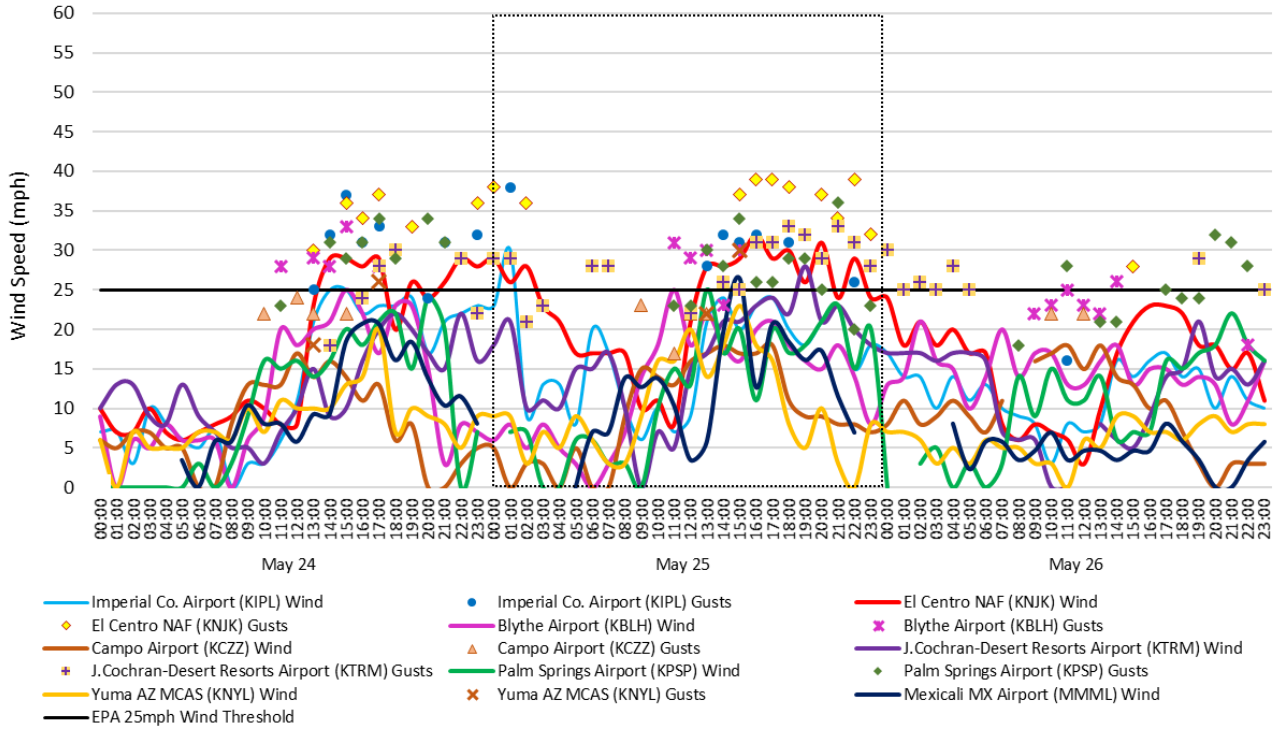


Fig 2-3: is a three-day graphical representation of the measured wind speed and wind gust (if available) from local and neighboring airports. Note the reduced winds just prior to the stronger late afternoon to evening winds, as discussed by the San Diego NWS office. All data derived from the Local Climatological Data Hourly Observations (LCD) reports released by the NOAA https://www.ncdc.noaa.gov/. Data for MMML from the University of Utah's MesoWest

FIGURE 2-4
WIND SPEEDS AND GUST UPSTREAM SITES

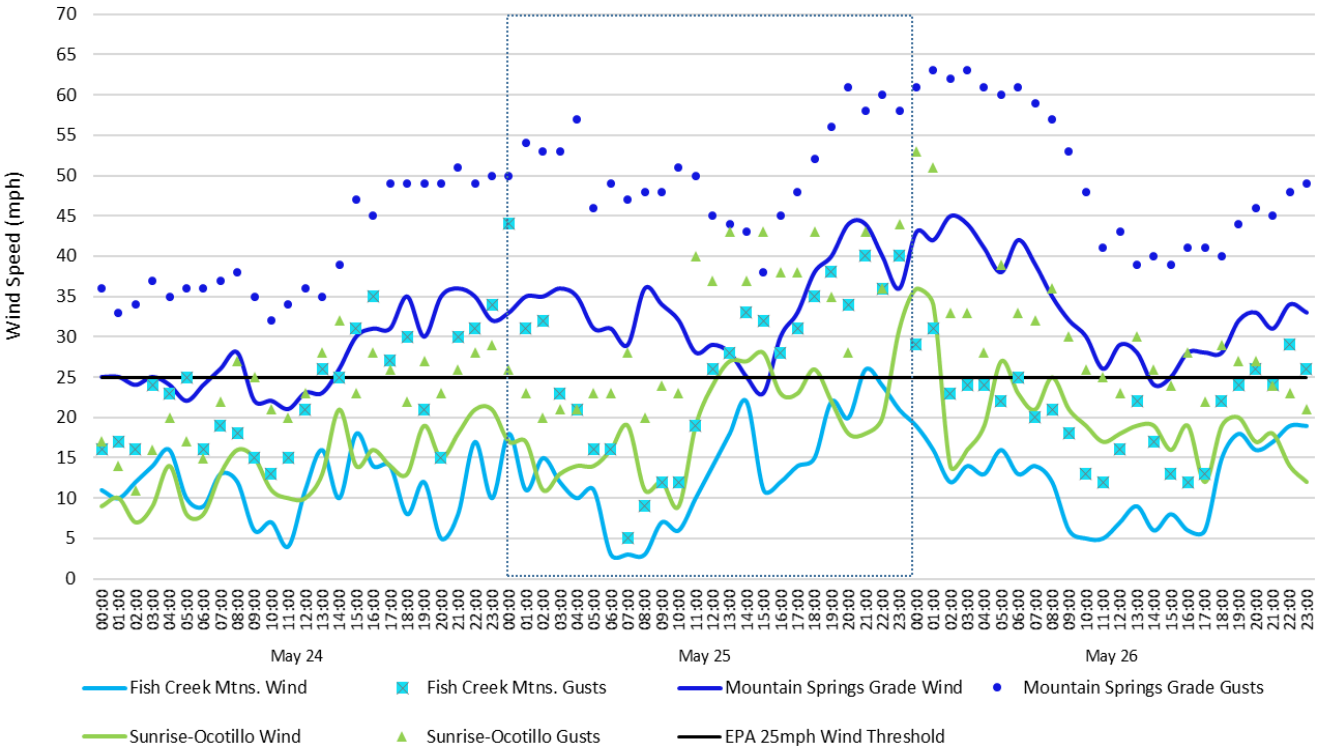


Fig 2-4: is a three-day graphical representation of the measured wind speed and wind gust (if available) from sites located upwind from the Brawley monitor. All data derived from the University of Utah's Meso West https://mesowest.utah.edu/index.html

The National Oceanic and Atmospheric Administration (NOAA) Laboratory HYSPLIT back-trajectory models[9] provide supporting evidence of the westerly airflow within Imperial County on May 25, 2017. The HYSPLIT back-trajectory models **Figures 2-5 and 2-6** represent the 1300 PST hour when Brawley first measured an elevated concentration above 100 µg/m^3, and the first peak hourly concentration at Brawley 1700 PST.

[9] 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 ALL SITES MAY 25, 2017 1300 PST

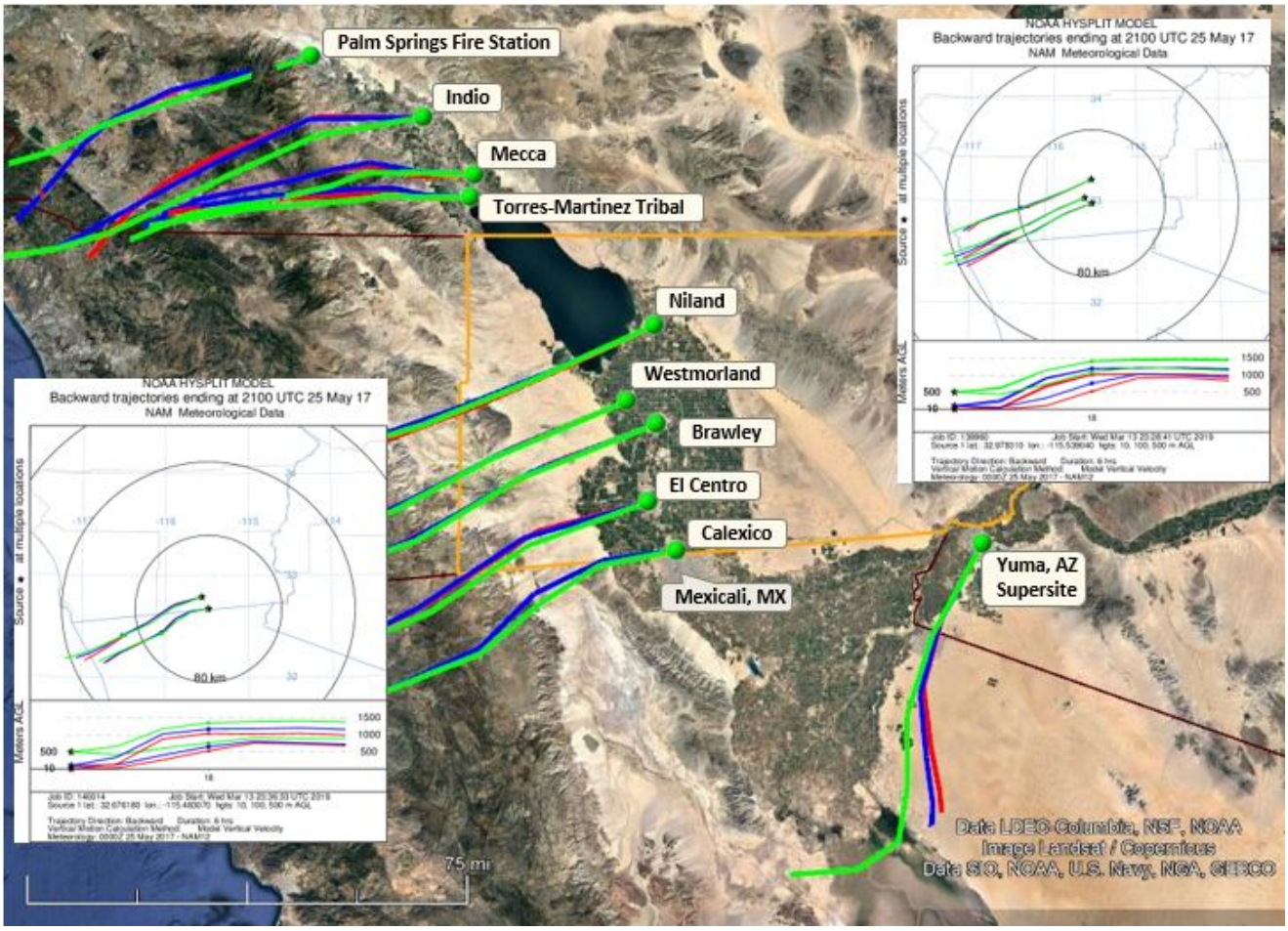


Fig 2-5: A 6-hour back-trajectory ending at 1300 PST for all sites identified in **Table 2-1**. Note the airflow at the Yuma Supersite. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

FIGURE 2-6
HYSPLIT MODEL ALL SITES MAY 25, 2017 1700 PST

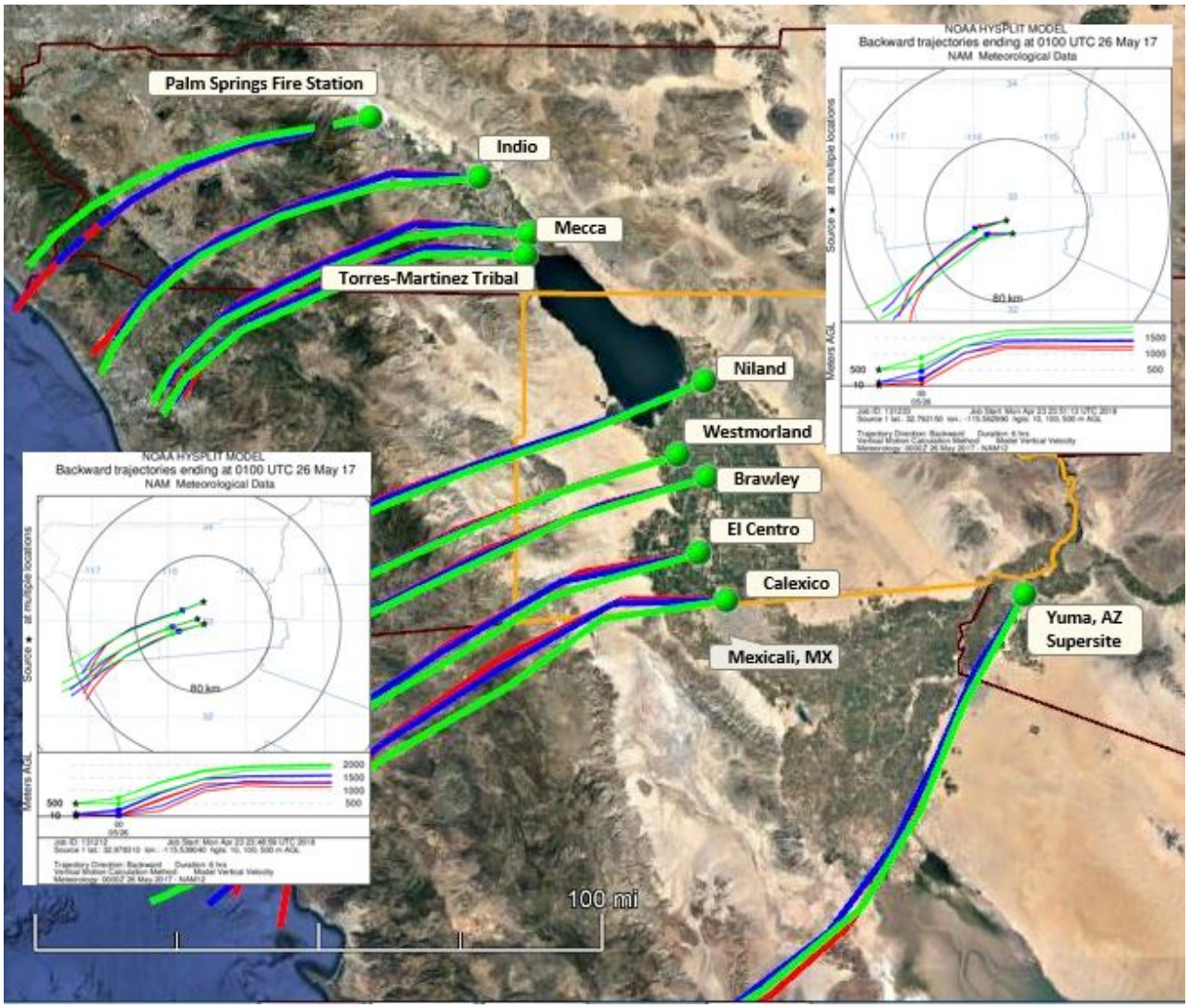


Fig 2-6: A 6-hour back-trajectory ending at 1700 PST for all regional monitors identified in **Table 2-1.** Note the airflow at the Yuma Supersite. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

As a shortwave trough moved inland producing a cooling trend; a rapid deepening of the marine layer, producing isolated showers; and with the combination of the height falls and the upper jet proximity (over Baja California), gusty westerly winds blew through and over the San Diego Mountains and onto the open natural desert areas west of Imperial County. The Brawley monitor was the only monitor to exceed the NAAQS, by 14 µg/m^3, on May 25, 2017, primarily because of sufficient moisture levels within the San Diego Mountains. The 24-hour averaged particulate concentrations measured at the air monitors, on May 25, 2017, were below the NAAQS but well above100 µg/m^3 (except the

El Centro monitor). Like the other monitors, the El Centro monitor measured elevated concentrations during the morning and evening hours albeit below 100 µg/m^3. Unlike other Pacific low-pressure systems, where moisture levels fall primarily closer to the coastal portions of San Diego or within Los Angeles, the mountains west of Imperial County received sufficient moisture resulting in lower amounts of transported windblown dust to combine with naturally occurring dust from the open deserts west of Imperial County.

Needless to say, the Imperial County Airport (KIPL) and the El Centro Naval Air Facility (KNJK) both measured wind speeds at or above 25 mph. Although KIPL measured its highest winds and gusts early in the morning, winds during the afternoon and evening were just under 25 mph, with gusts easily exceeded 30 mph. KNJK from 100 pm PST on had eight hours of winds at or above 25 mph, with gusts that reached 39 mph. Winds at Mountain Springs Grade and Sunrise-Ocotillo measured winds above 30 mph and strong gusts, in some cases above 60 mph.

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, as a shortwave trough moved inland, whose features included a cooling trend, isolated showers, and advisory level gusty westerly winds, air quality was affected within southeast California and Arizona. Both NWS offices issued wind advisories was early as May 24, 2017 with a total of eleven (11) Urgent Weather Messages advising of strong gusty westerly winds affecting the San Diego Mountains, deserts (i.e. Anza Borrego) and Imperial County. Each of these Urgent Weather Messages advised of reduced visibility due to blowing sand and dust, with the San Diego NWS office much more confident the reduced visibility would be 2 to 5 miles.

While elevated wind speeds play a significant and important role in the transportation of dust, gusts and the level of moisture play an equally significant role in deposition of particulates onto a monitor and the overall affect onto ambient air.[10] Measured gusts were significantly higher within upwind locations, along the slopes of the San Diego Mountains, which measured elevated wind speeds above 25 mph (i.e. Mountain Springs Grade measured gusts of 61 mph, Sunrise-Ocotillo measured gusts at or above 40 mph). Such gusts assisted in transporting windblown dust into Imperial County.

Finally, according to NOAA, blowing dust was visible spreading to the east and northeast, into Arizona and Nevada, from sources within the vicinity of the Salton Sea and the northern desert regions of Southern California (**Appendix A**).[11]

Figure 3-1 below provides an illustration of some of the meteorological conditions, as described above on May 25, 2017 which affected air quality in Imperial County causing an exceedance of the NAAQS at the Brawley monitor. Although the Brawley monitor was the only monitor to exceed, other monitors also measured elevated 24-hour PM_{10} averages. The Niland monitor measured 154 µg/m^3 while the Calexico and Westmorland monitors measured 140 µg/m^3 and 129 µg/m^3, respectively. The El Centro monitor having a much more urbanized surrounding measured a significantly lower 24-hour average. Niland narrowly avoided an exceedance, as dust settled out as it was carried over the expanse of the Salton Sea before reaching the Niland station.

[10] 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

[11] NOAA, Satellite Services Division, Smoke Text Product, Descriptive Text Narrative for Smoke/Dust Observed in Satellite Imagery through 0300Z, May 26, 2017 issued May 25, 2017, https://www.ssd.noaa.gov/PS/FIRE/DATA/SMOKE/2017/2017E260347.html

FIGURE 3-1
VISUAL RAMP-UP ANALYSIS AS DISCUSSED FOR MAY 25, 2017

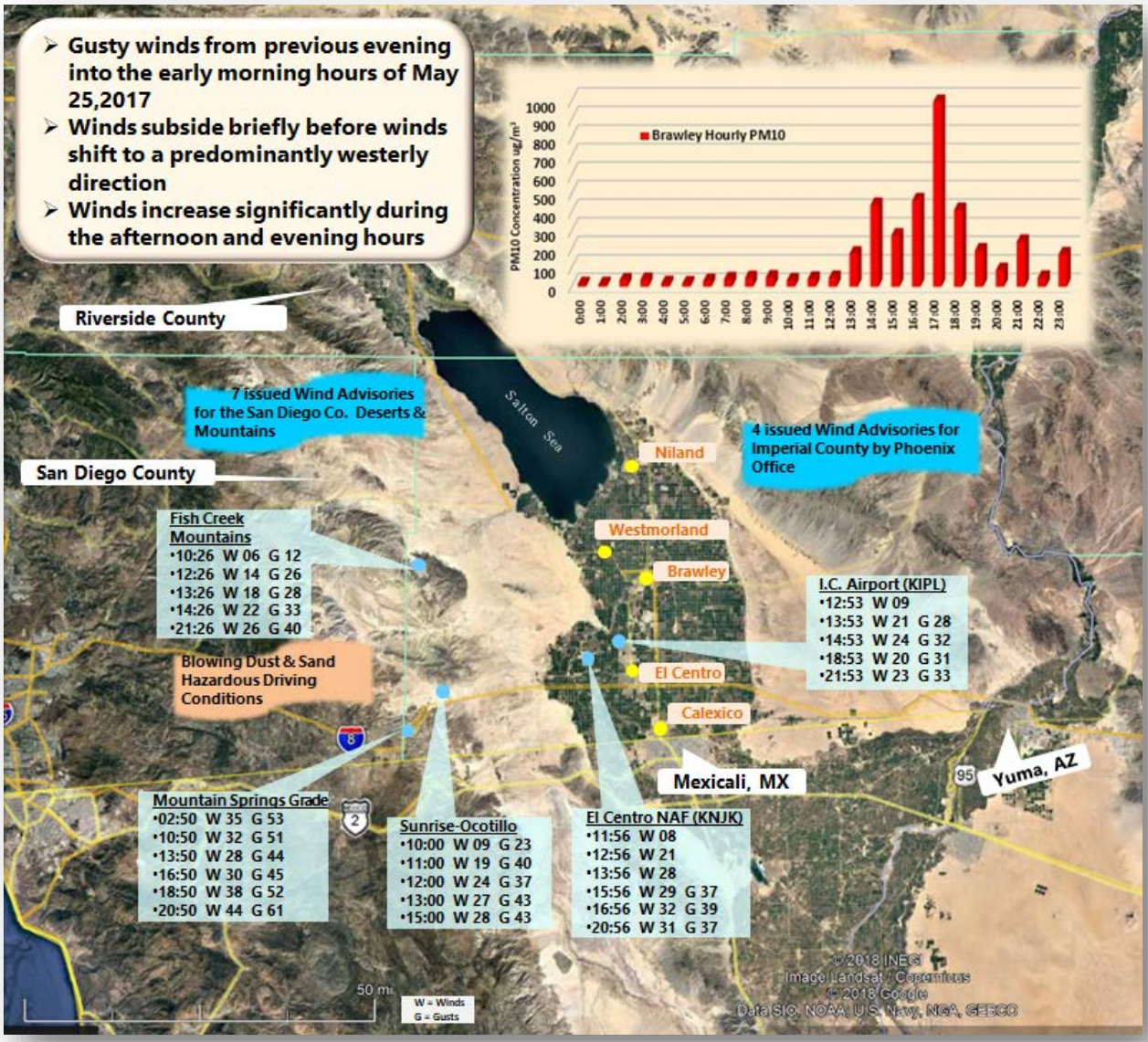


Fig 3-1: Gusty elevated winds at upstream sites transported dust into Imperial County from as far as the mountains of San Diego County. Air quality data is from the EPA's AQS data bank. Google Earth base map

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.[12]

Both the Imperial County Airport (KIPL) and the El Centro Naval Air Facility (KNJK) measured reduced visibility on May 25, 2017. Reduced visibility is coincident with elevated wind speeds, wind gusts and hourly concentrations of particulates. According to the compiled information found in **Figure 3-2,** visibility at KNJK reduced as early as 1200 pm PST an hour before the Brawley monitor measured its first concentration above 100 µg/m^3.

While **Figure 3-2** is a graphical representation of the reduced visibility within Imperial County, **Table 3-1** provides a temporal relationship of wind speed, wind direction, wind gust, and PM_{10} concentrations at the Brawley, Niland, Westmorland, Calexico and El Centro monitors. Together, the data provides the supporting relationship between the elevated winds and reduced visibility.

[12] 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

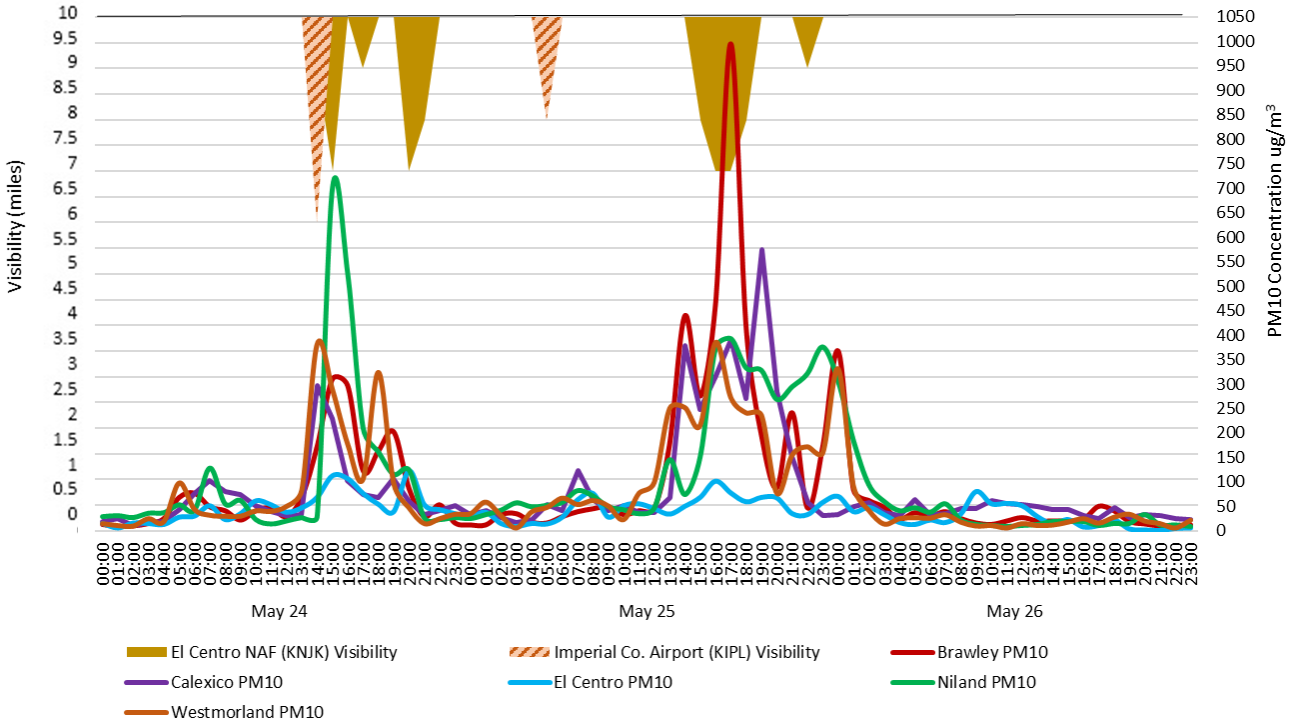


Fig 3-2: is a graphical representation of the compiled data from Imperial County Airport (KIPL) and the El Centro NAF (KNJK). Reported reduced visibility is coincident with elevated winds and hourly levels of concentrations either just prior to peak concentrations or after. Visibility data from the NCEI's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

Because the EPA accepts a high wind threshold for sustained winds of 25 mph in California and 12 other states[13] the **Table 3-1** is provided in support of the relationship between the elevated winds and elevated concentrations. The measured elevated concentrations of PM_{10} either follow or occur during periods of elevated winds or gusts. The table has a select group of meteorological sites that compare the hourly winds with the closest measured hourly concentration at each monitor in Imperial County.

[13] "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 FOR ALL SITES MAY 25, 2017

	MOUNTAIN SPRINGS GRADE (TNSC1)			SUNRISE-OCOTILLO (IMPSD)			EL CENTRO NAF (KNJK)			IMPERIAL COUNTY (KIPL)			FISH CREEK MOUTAINS (FHCC1)			BRLY	NLND	WSTMLD	CX	EC
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	W/S	W/G	W/D	PM_{10} (µg/m3)				
000	33	50	212	17	26	299	29	38	280	23	29	260	18	44	223	13	26	36	33	29
100	35	54	213	17	23	303	26		280	30	38	270	11	31	206	13	34	60	42	39
200	35	53	209	11	20	260	28	36	280	9		280	15	32	223	34	43	32	28	16
300	36	53	207	13	21	314	23		280	13		270	12	23	225	36	58	7	16	10
400	35	57	206	14	21	325	21		270	13		270	10	21	211	19	50	40	24	16
500	31	46	210	14	23	323	17		240	8		260	11	16	201	17	53	49	54	15
600	31	49	210	16	23	290	17		250	20	28	240	3	16	124	30	59	68	42	29
700	29	47	213	19	28	284	17		240	17		250	3	5	75	40	83	55	124	64
800	36	48	204	11	20	270	17		250	10		170	3	9	112	46	72	63	64	77
900	34	48	203	12	24	243	10		140	6		160	7	12	107	50	50	52	41	29
1000	32	51	209	9	23	210	11		140	10		120	6	12	205	34	44	24	52	52
1100	28	50	219	19	40	245	8		VRB	7		250	10	19	207	42	36	78	37	56
1200	29	45	220	24	37	238	21		250	9		250	14	26	188	47	47	100	37	46
1300	28	44	217	27	43	234	28		250	21	28	270	18	28	195	178	146	251	68	35
1400	25	43	208	27	37	239	28		250	24	32	270	22	33	204	440	75	253	378	51
1500	23	38	236	28	43	234	29	37	260	20	31	260	11	32	251	276	152	217	248	69
1600	30	45	221	23	38	247	32	39	260	23	32	270	12	28	255	465	374	386	318	102
1700	33	48	219	23	38	247	29	39	270	24	31	270	14	31	212	995	393	273	390	78
1800	38	52	210	26	43	251	30	38	260	20	31	270	15	35	232	413	333	242	270	60
1900	40	56	206	22	35	241	26		260	18		260	22	38	219	195	328	237	575	69
2000	44	61	209	18	28	315	31	37	250	21		250	20	34	214	89	269	78	285	68
2100	44	58	206	18	43	313	24	34	260	23	33	260	26	40	182	242	295	156	152	36
2200	40	60	213	20	36	271	29	39	260	15	26	270	24	36	204	48	322	173	57	34
2300	36	58	220	31	44	242	24	32	270	18		280	21	40	205	174	376	161	31	59

Wind data for KNJK and KIPL from the NCEI's QCLCD system. Wind data for TNSC1, IMPSD, and FHCC1 from the University of Utah's MesoWest system. 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, eleven (11) Urgent Weather Messages containing wind advisories and blowing dust advisories described the gusty westerly winds for the region extending from the San Diego Mountains, Valleys, and into the Imperial County. As the low-pressure system moved inland, the gusty westerly winds affected different regional air monitors in Riverside and Imperial counties (**Table 2-1**). Overall, the preceding winds associated with the weather system affected air quality in Imperial County.

III.1 Summary of Forecasts and Warnings

As mentioned above, both the San Diego and Phoenix NWS offices described the passing of a shortwave trough with associated advisory level winds into the southwest. The weather system included a cooling trend, isolated showers and surface high winds. As a result, eleven (11) separate Urgent Weather Messages were issued by either the San Diego or Phoenix NWS offices identifying among other areas, the San Diego Mountains, San Diego deserts (Anza Borrego), and Imperial County and gusty westerly winds 25 to 35 mph with gusts in excess of 25 mph (**Appendix A**).

Finally, four Weather Stories were issued, three by the San Diego office, and one by the Phoenix office for May 25, 2017. These Weather Stories advised of cooler weather, scattered light showers, gusty westerly winds, and reduced visibility due to blowing sand and dust affecting the San Diego Mountains, deserts and the western portion of Imperial County through Friday, May 26, 2017.

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 Brawley monitor. Data collected from these sites substantiate that on May 25, 2017 wind speeds upstream of Brawley were well in excess of 25 mph for multiple hours with gusts above 40 mph.

IV Concentration to Concentration Analysis – An analysis 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 and 4-2 show the time series of available FRM and BAM 24-hr PM_{10} concentrations at the Brawley monitor for the period of January 1, 2010 through May 25, 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).[14] 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 May 25, 2017, as measured by the Brawley monitor, was used to establish the historical and seasonal variability over time.[15] All figures illustrate that the exceedance, which occurred on May 25, 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.

[14] 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.

[15] FRM sampling ended December 2016.

FIGURE 4-1
BRAWLEY HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MAY 25, 2017

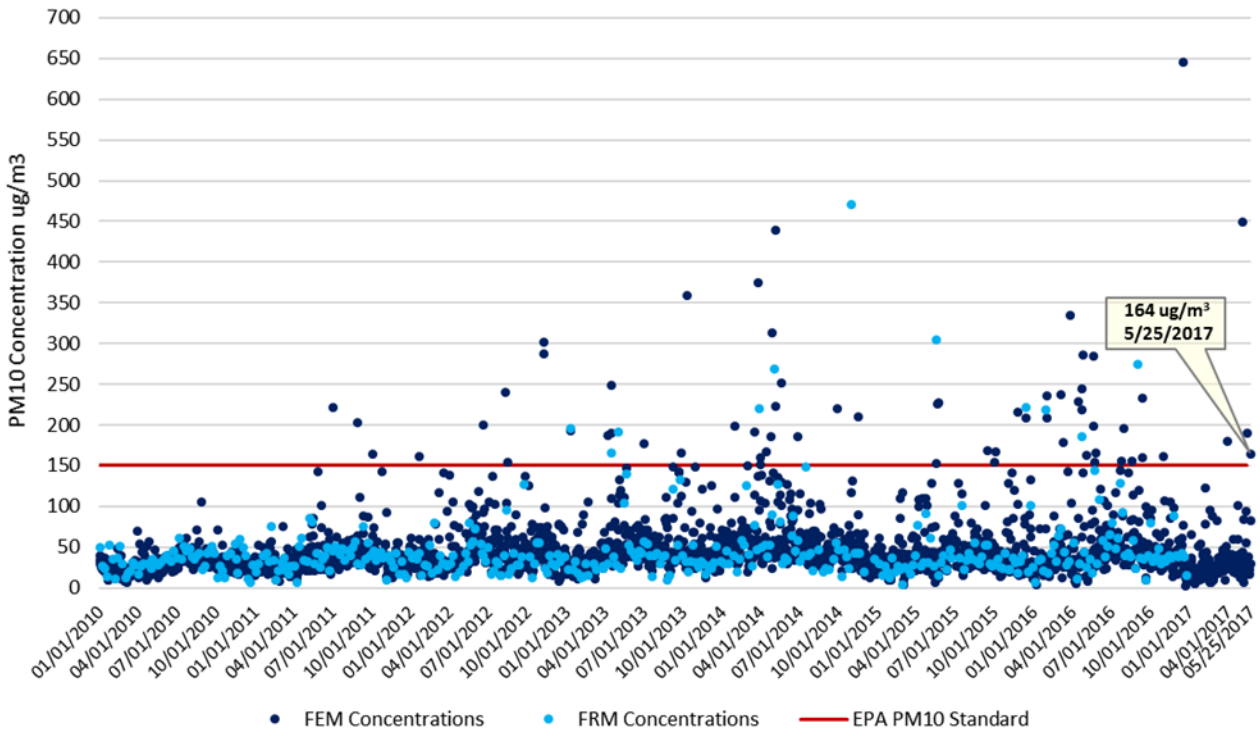
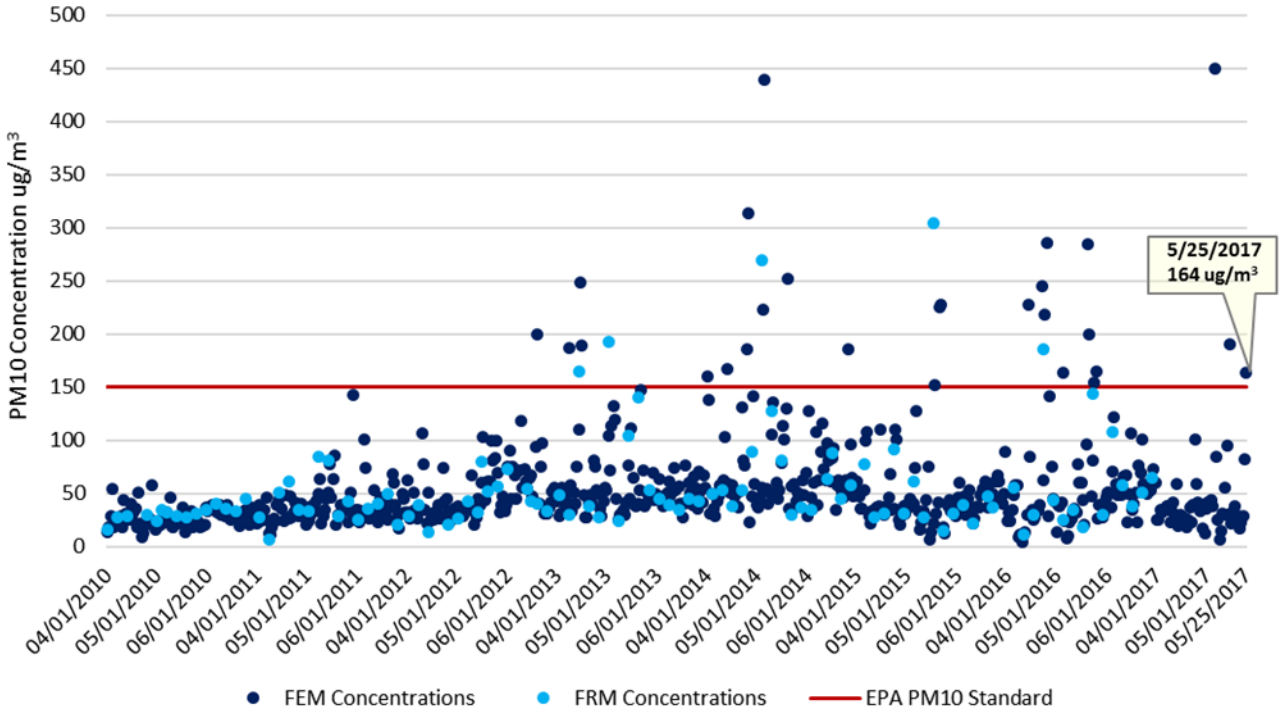


Fig 4-2: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 164 µg/m^3 on May 25, 2017 by the Brawley monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-1,** for Brawley included 2,702 sampling days (January 1, 2010 through May 15, 2017). Of the 2,702 sampling days the Brawley monitor measured 63 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, thirteen (13) exceedance days measured during the third quarter; and eleven (11) exceedance days measured during the fourth quarter.

FIGURE 4-2
BRAWLEY SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***APRIL 1, 2010 TO MAY 25, 2017**



***Quarterly: April 1, 2010 to June 30, 2016 and April 1, 2017 to May 25, 2017**

Fig 4-2: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 164 µg/m³ by the Brawley monitor on May 25, 2017 was outside the normal seasonal concentrations when compared to similar event days and non-event days

Figure 4-2 illustrates the seasonal fluctuations over a period of 692 sampling days, 795 credible samples and twenty-seven (27) exceedance days. This translates to less than a 4% seasonal exceedance occurrence rate.

Examining the historical and seasonal time series concentrations as they relate to the May 25, 2017 measured exceedance, the exceedance measured on May 25, 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 the mountains within San Diego County and the western edge of Imperial County. 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

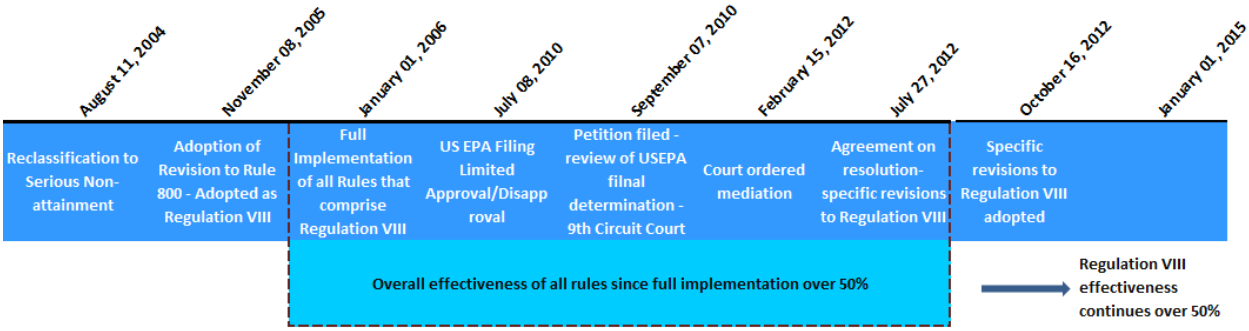


Fig 5-1: Regulation VIII Graphic Timeline

V.1 Wind Observations

As previously discussed, wind data analysis indicates that on May 25, 2017 different sites measured wind speeds at or above 25mph. Wind speeds of 25 mph are normally sufficient to overcome most PM_{10} control measures. During the May 25, 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 during the May 25, 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 May 25, 2017, officially declared as a No Burn Day, related to agricultural burning, waste burning or dust.

FIGURE 5-2
PERMITTED SOURCES

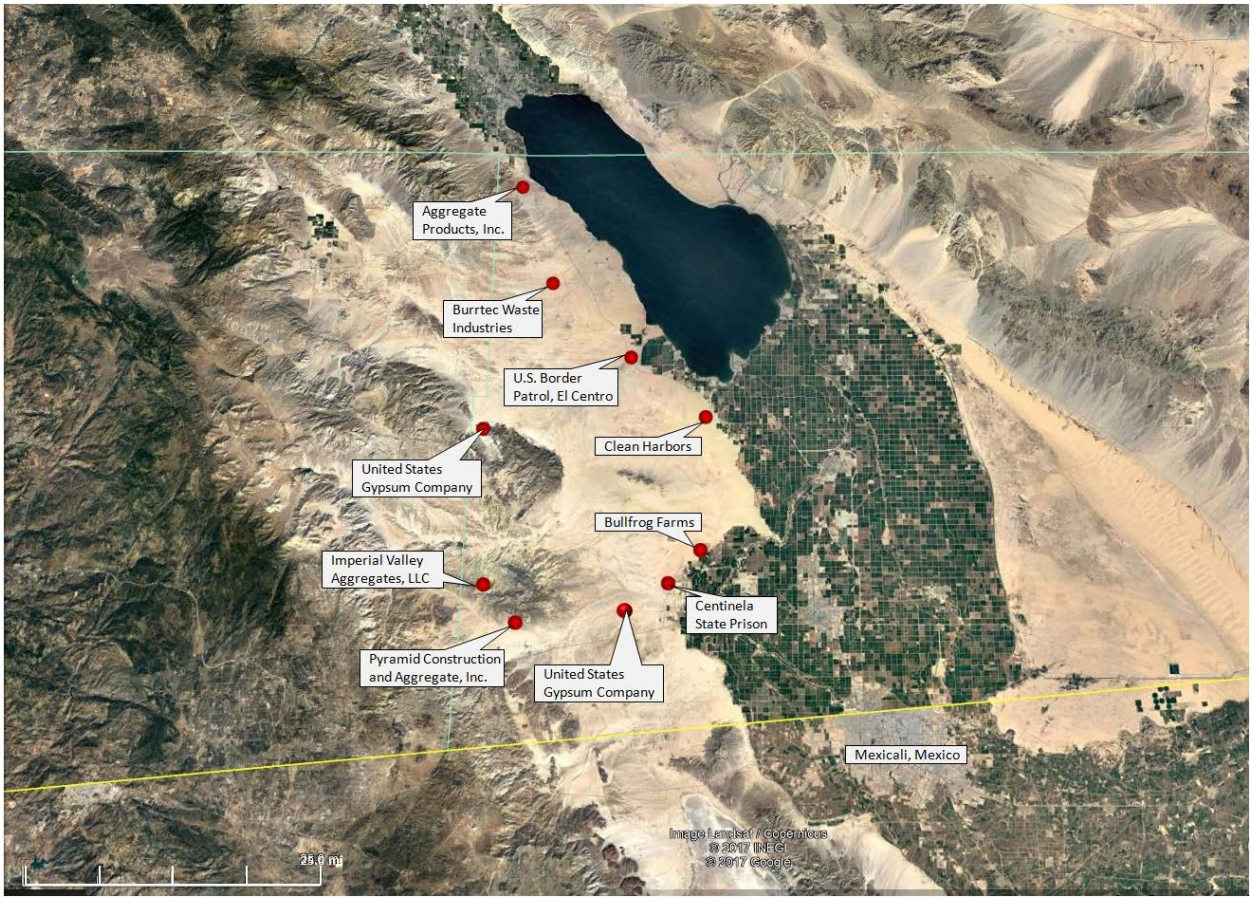


Fig 5-2: The above map identifies those permitted sources located west, northwest and southwest of the Brawley monitor. The green line to the north denotes the political division between Imperial and Riverside counties. The yellow line below denotes the international border between the United States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

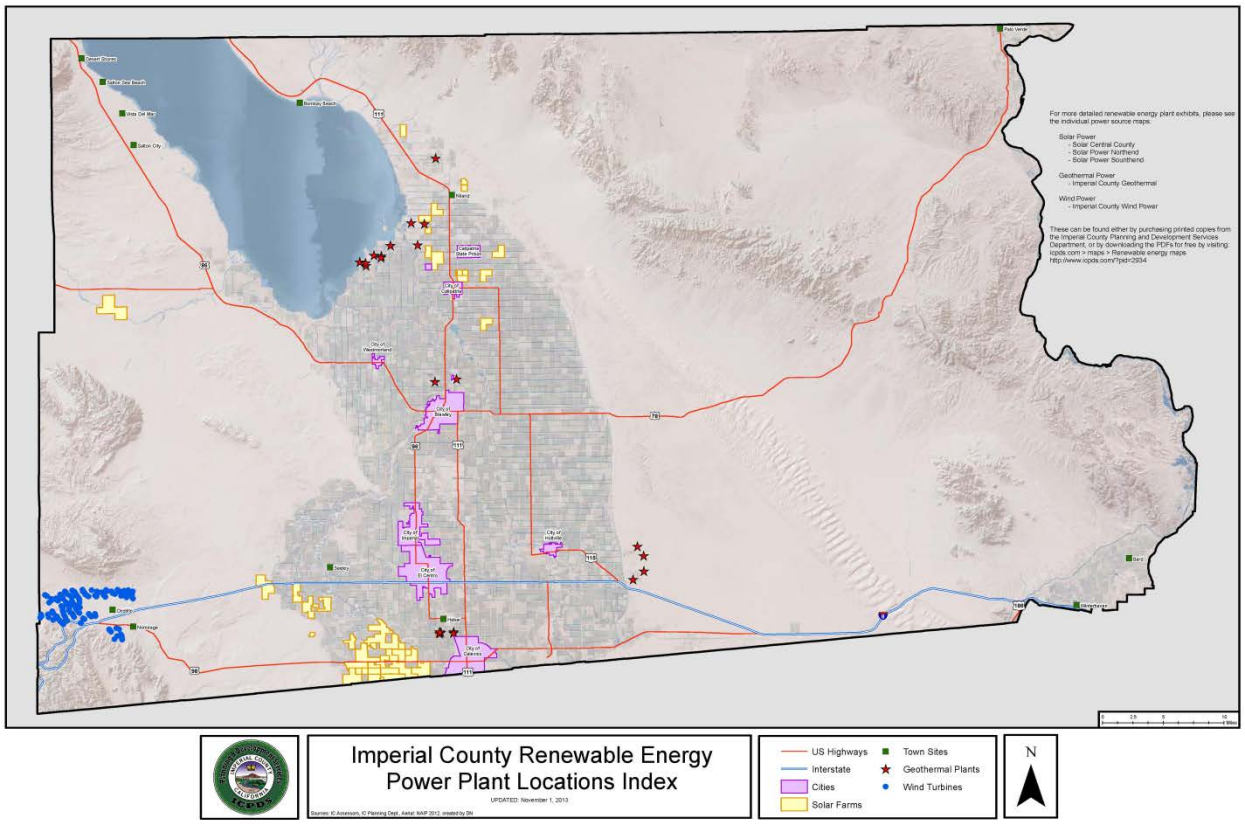


Fig 5-3: The above map identifies those power sources located west, northwest and southwest of the Brawley monitor. Blue indicate the Wind Turbines, Yellow are the solar farms and stars are geothermal plants

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 will not only bring gusty westerly winds but are accompanied with shortwave troughs that bring a cooling trend and showers. The shortwave trough that passed through the region brought with it, sufficient moisture within the San Diego Mountains to minimize the amount of transported windblown dust into Imperial County. Essentially, the cool weather and the brief weakening of the winds during the mid-morning hours would have allowed the precipitation to saturate sufficiently to reduce or minimize transported dust.

As a consequence, a single monitor, the Brawley monitor, exceeded the NAAQS on May 25, 2017 by a mere 14 µg/m^3. The combination of moisture levels within the mountains of San Diego and the gusty westerly winds provided the ideal conditions for the remaining monitors within Imperial County to measure 24-hour averaged particulate concentrations below the NAAQS but well above100 µg/m^3, the only exception was the El Centro monitor. Like the other monitors, the El Centro monitor measured elevated concentrations during the morning and evening hours albeit below 100 µg/m^3.

Finally, wind speeds and wind gusts were sufficient to overcome BACM in Imperial County. **Figure 6-1**, below, provides the trace precipitation amounts as measured at KIPL and KNJK on May 24, 2017 and May 25, 2017.

TABLE 6-1

PRECIPITATION TOTALS		
LOCATION*	**5/24/2017**	**5/25/2017**
El Centro NAF (KNJK)	Trace	Trace
Imperial County Airport (KIPL)	Trace	Trace

*KNJK and KIPL from QCLCD.

FIGURE 6-1
PRECIPITATION HELPS SUPPRESS DUST

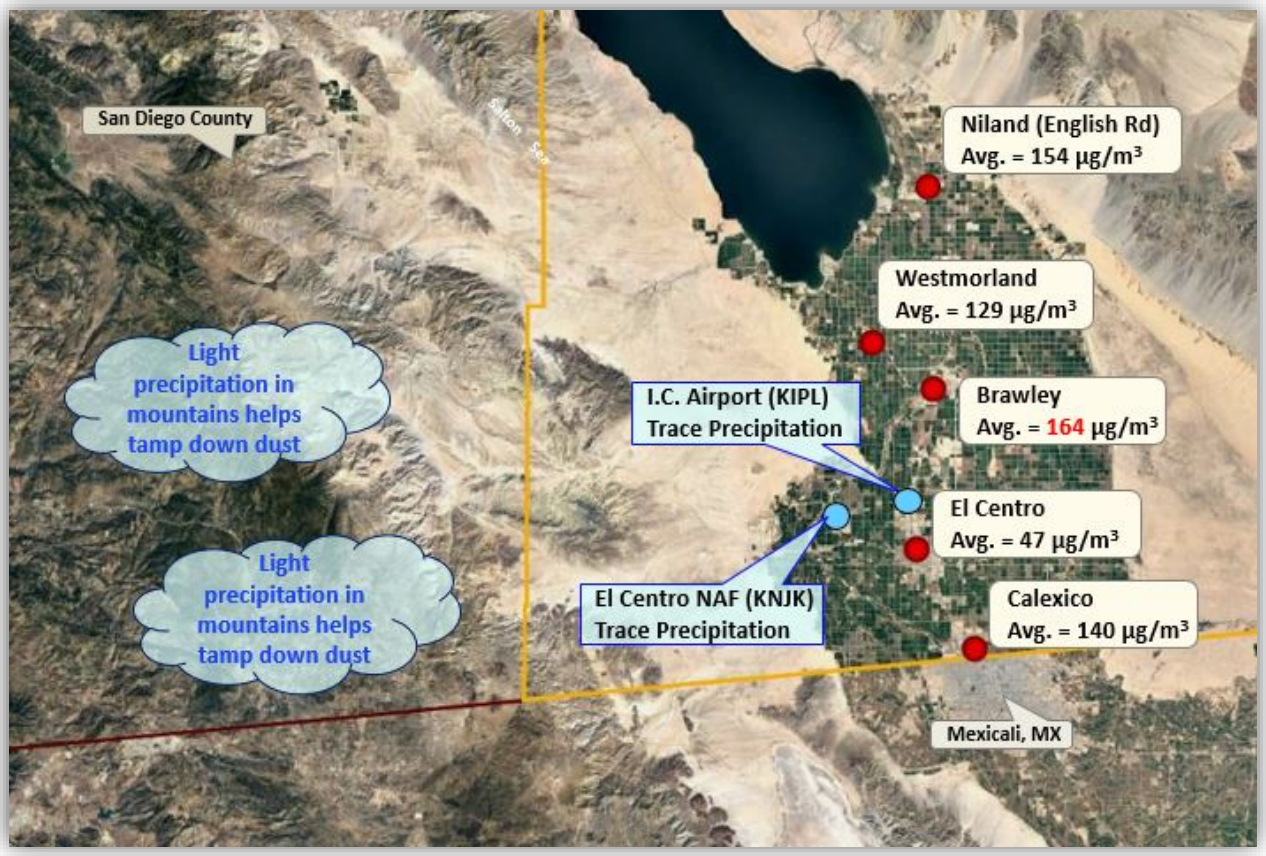


Fig 6-1: The Light precipitation within the mountains and trace precipitation at KIPL and KNJK on the desert floor suppressed transported fugitive dust. Map from Google Earth

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 May 25, 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 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} exceedance measured at the Brawley monitor was caused by naturally occurring strong gusty westerly winds that transported windblown dust into Imperial County and other parts of southern California from areas as far as the mountain ranges within San Diego County. These facts provide strong evidence that the PM_{10} exceedance measured at the Brawley monitor on May 25, 2017, was 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 on May 25, 2017, was caused by the transport and suspension of windblown dust into Imperial County by gusty 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 monitor in Imperial County demonstrates a consistency of elevated gusty westerly winds with elevated concentrations of PM_{10} on May 25, 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. Although winds remained elevated May 24, 2017 and through May 25, 2017 moisture from the weather system was sufficient to keep PM_{10} below the NAAQS at all but the Brawley monitor. Overall, the demonstration provides evidence of the strong correlation between the natural event and the transported windblown dust to the exceedance on May 25, 2017.

VI.5 Concentration to Concentration Analysis

The historical annual and seasonal 24-hr average PM_{10} measured concentrations at the Brawley monitor were outside the normal historical concentrations when compared to event and non-event days.

VI.6 Conclusion

The preceding discussion, graphs, figures, and table provide wind direction, speed and concentration data illustrating the spatial and temporal effects of the strong gusty westerly winds that accompanied the identified low-pressure system 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 the Brawley monitor on May 25, 2017.

In particular, the clear causal relationship and not reasonably controllable or preventable sections provide evidence that high winds associated with the May 25, 2017 high wind dust event generated emissions from the as far as the mountains within San Diego County onto the natural open desert west of Imperial County (all part of the Sonoran Desert). In addition, during the May 25, 2017 event, anthropogenic sources within upwind areas were reasonably controlled at the time of the event thus the May 25, 2017 event meets the definition of a Natural Event.[16]

[16] 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.