IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

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June 17, 2018
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 Imperial County, California on June 17, 2018

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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. 17
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. 34

[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 Sunday, June 17, 2018 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. As early as Thursday, June 14, 2018 the ICAPCD published on its webpage a forecast synopsis from both the San Diego and Phoenix NWS offices advising the public that monsoonal air moving out of northern Mexico could generate gusty outflow winds that had the potential to suspend particulate matter into the air. Prior to the weekend, the ICAPCD published on its webpage a forecast synopsis from both the San Diego and Phoenix NWS offices through Friday, June 15 through Monday, June 18, 2018 advising the public that a large trough would bring cooling over the weekend and gusty winds across the San Diego County Mountains and Deserts. The ICAPCD routinely monitors notices issued by the NWS Phoenix and San Diego offices for weather updates during wind events. **Appendix C** contains copies of notices pertinent to the June 17, 2018 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 Sunday, June 17, 2018, a naturally occurring event elevated particulate matter within San Diego, Riverside and Imperial Counties, causing an exceedance at the Brawley (06-025-0007) air quality monitoring station. 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 June 17, 2018. After review, CARB submitted the INPEE, for the June 17, 2018 event in July of 2019. The submitted request included a brief description of the meteorological conditions for June 17, 2018 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 June 7, 2018 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 168 µg/m^3 measured by the Brawley monitor on June 17, 2018.

(B) Concurrently with the Public Review period for the June 17, 2018 exceptional event, the ICAPCD is formally submitting to CARB for remittance to USEPA the Final June 17, 2018 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 2018 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

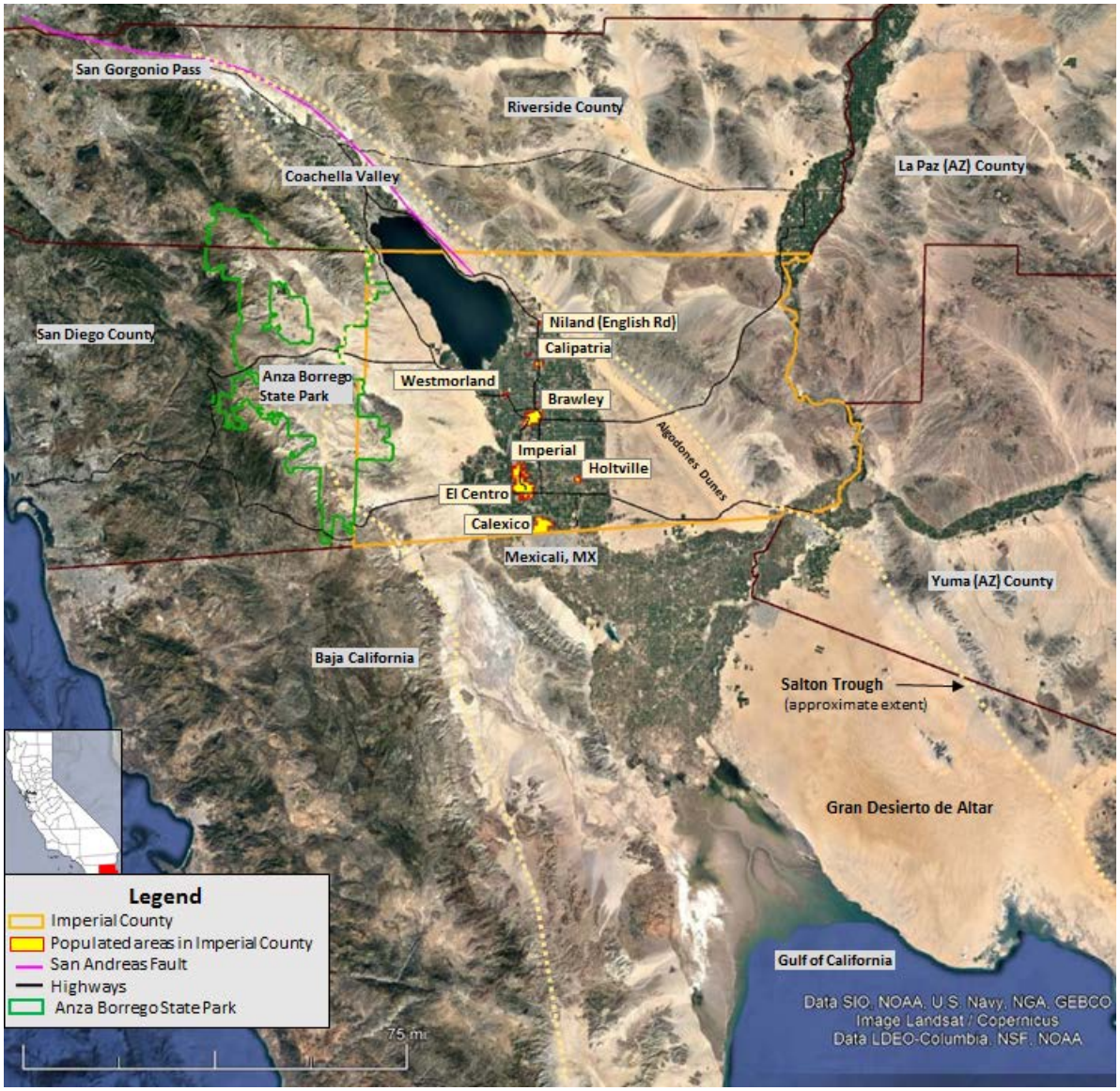

Fig 1-1: Imperial County a Southern California border region, within far southeast California bordering Arizona and Mexico has a small economically diverse region with a population of 174,528

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 monitors

II.1 Description of the event causing the exceedance

Day before and during Sunday, June 17, 2018 the NWS San Diego office began discussing a strengthening low pressure system along the West Coast that was forecast to deepen and move inland over the weekend and tighten the surface pressure gradient and produce strong gusty westerly winds across the San Diego County mountains and deserts. [4,5,6,7] Areas of drizzle to light rain were expected west of the San Diego County mountains Sunday morning.[8,9,10] Some moisture made it to the Imperial Valley. Trace precipitation was measured at El Centro NAF (KNJK) for 18 hours on Sunday, June 17, 2018. Two forecast discussions issued by both San Diego and Phoenix summarized the expected impacts of the approaching weather disturbance:

> "A trough moving down the coast this weekend will bring cooling this weekend and a very deep marine layer…The marine layer will be even deeper tonight as onshore flow strengthens ahead of an unusually deep trough over NoCal (Northern California)…Other impacts from this trough will be the cooler than average temperatures and the gusty westerly winds in the mountains and deserts"[11]

> "Much of southeast California, and particularly along Interstate 8 near Ocotillo and northward through Kane Spring, will be fairly breezy Saturday and Sunday afternoons. Given that very little precipitation fell in this area, and the atmosphere will quickly dry out tomorrow, blowing dust might be a slight concern here"[12]

No wind advisories for either the San Diego County deserts or mountains or Imperial County were issued. **Appendix A** contains all pertinent NWS notices.

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[4] National Weather Service, Area Forecast Discussion, June 14, 2018, San Diego office, 206pm PST
[5] National Weather Service, Area Forecast Discussion, June 15, 2018, San Diego office, 130pm PST
[6] National Weather Service, Area Forecast Discussion, June 16, 2018, Phoenix office, 315pm MST
[7] National Weather Service, Area Forecast Discussion, June 17, 2018, Phoenix office, 239pm MST
[8] National Weather Service, Area Forecast Discussion, June 15, 2018, San Diego office, 130pm PST
[9] National Weather Service, Area Forecast Discussion, June 16, 2018, San Diego office, 240am PST
[10] National Weather Service, Area Forecast Discussion, June 16, 2018, San Diego office, 930am PST
[11] National Weather Service, Area Forecast Discussion, June 16, 2018, San Diego office, 930am PST
[12] National Weather Service, Area Forecast Discussion, June 16, 2018, Phoenix office, 315pm MST

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

On June 17, 2018, the air monitors in Imperial, Riverside and Yuma counties measured elevated concentrations of particulate matter when a forecasted low-pressure system moved inland from the Pacific coast over California and tightened the surface pressure gradient that produced strong and gusty westerly winds across southeastern California. The strong gusty westerly winds associated with the system 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

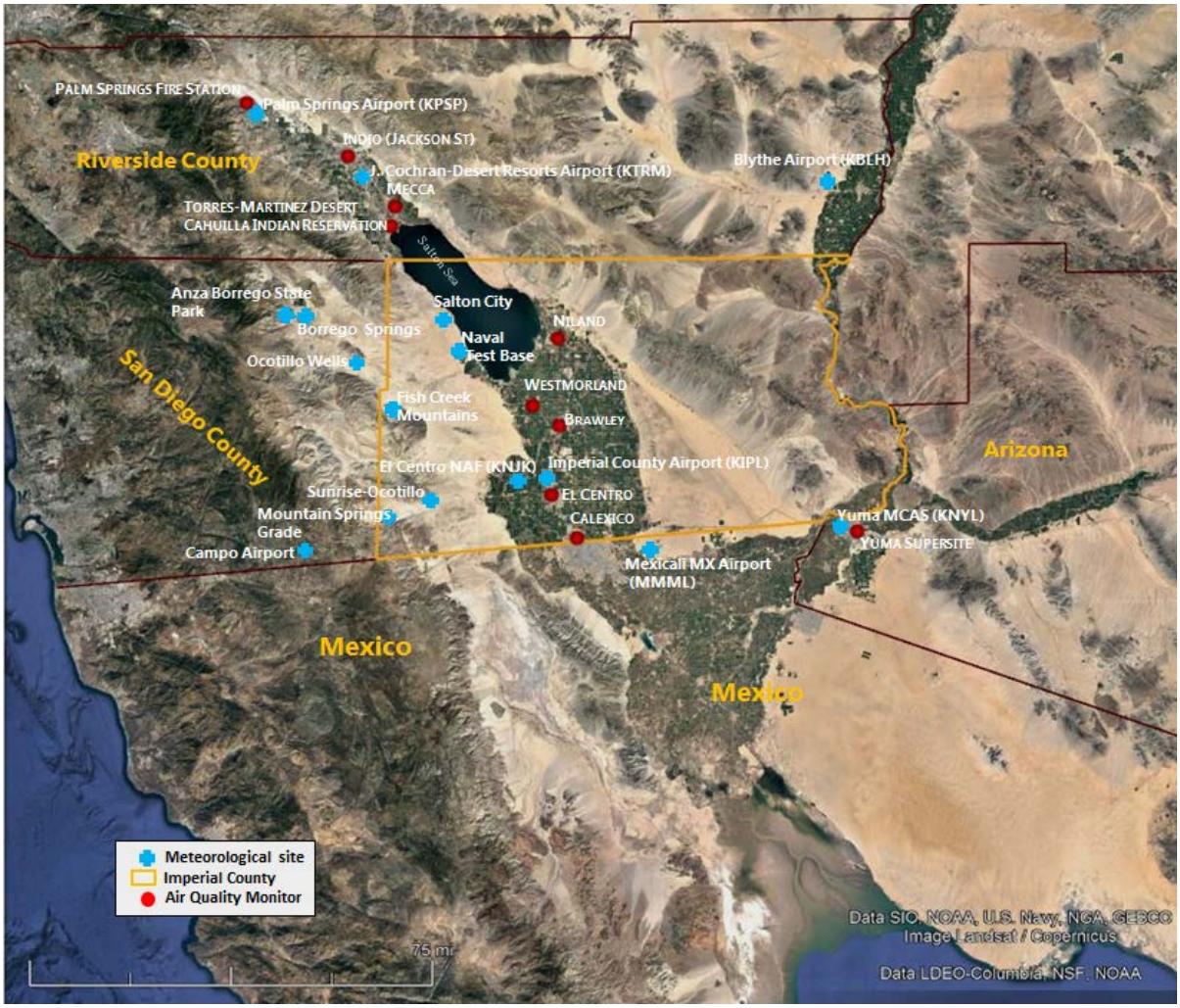


Fig 2-1: Includes a general location of the sites used in this analysis. The site furthest south is in Mexicali, Mexico and the site furthest north is the Palm Springs Fire Station

TABLE 2-1
HOURLY CONCENTRATIONS OF PARTICULATE MATTER

SITE	DATE	000	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Hrly MAX	24-HR AVERAGE
PALM SPRINGS FIRE STATION	20180616	17	23	20	23	21	27	25	24	23	27	24	26	28	30	25	18	29	49	52	43	27	22	19	23	52	26
	20180617	16	16	13	12	10	12	15	16	17	16	18	18	18	16	11	10	14	18	35	37	30	46	29	20	**46**	19
	20180618	13	9	11	12	12	17	18	22	18	17	14	15	19	29	25	28	31	42	39	44	38	31	30	29	44	23
INDIO	20180616	23	9	10	20	23	28	30	30	48	23	19	36	21	18	19	16	63	137	262	177	85	75	168	128	262	61
	20180617	54	74	71	18	16	20	38	66	36	20	17	14	15	16	20	22	41	251	113	62	114	82	88	63	**251**	55
	20180618	27	24	20	20	35	27	22	24	23	15	11	7	15	5	14	17	33	26	59	59	49	43	111	65	111	31
MECCA	20180616	21	22	17	15	23	34	17	14	29	14	21	15	0	3	9	67	47	231	537	450	180	116	310	209	537	100
	20180617	112	39	59	42	21	31	46	83	63	104	19	10	14	25	13	20	37	143	180	64	75	88	201	149	**201**	68
	20180618	44	36	15	17	62	47	54	25	48	94	111	37	43	27	19	16	63	48	79	64	78	80	44	75	111	51
TORRES-MARTINEZ TRIBABL	20180616	33	17	21	31	27	29	43	31	27	23	31	32	50	23	27	30	54	131	222	265	238	125	104	90	265	71
	20180617	74	55	53	39	31	22	24	28	34	23	16	21	21	24	25	29	60	77	144	105	62	80	41	57	**144**	47
	20180618	81	54	31	53	76	201	51	38	29	34	33		34	46	31	36	28	99	170	64	71	107	45	46	201	63
WESTMORLAND	20180616	15	11	12	8	6	9	16	27	29	19	26	27	30	25	50	265	374	530	745	392	425	244	116	146	745	147
	20180617	116	24	38	44	39	39	115	84	30	18	38	19	22	81	288	450	531	633	173	80	90	39	36	37	**633**	127
	20180618	27	48	33	31	31	44	60	59	29	23	21	14	25	15	14	20	9	24	46	59	53	42	43	34	60	33
BRAWLEY	20180616	15	5	9	9	6	4	19	25	26	24	26	20	28	26	24	180	356	445	273	235	241	467	147	161	467	115
	20180617	89	72	33	22	22	16	80	29	95	23	19	22	47	109	188	577	995	908	464	134	34	19	17	22	**995**	168
	20180618	21	37	43	21	36	40	47	45	51	25	26	28	24	21	25	21	17	35	25	28	23	18	29	29	51	29
NILAND	20180616	19	13	12	10	21	11	14	16	27	32	41	49	33	29	47	78	514	530	158	321	209	81	158	160	530	107
	20180617	103	32	55	45	50	54	62	36	24	21	19	21	24	15	39	62	108	202	75	91	52	41	27	24	**202**	53
	20180618	32	31	29	20	27	34	50	26	21	21	19	16	15	12	15	11	8	6	3	6	175	62	34	40	175	29
EL CENTRO	20180616	28	21	14	15	14	18	25	25	26	25	18	20	27	29	36	36	62	62	69	55	97	138	46	23	138	38
	20180617	16	14	18	16	21	14	32	16	16	15	17	9	21	51	162	124	135	176	77	39	33	22	23	22	**176**	45
	20180618	20	16	12	47	77	74	45	37	34	35	23	24	12	11	13	15	17	11	27	35	35	33	29	35	77	29
CALEXICO	20180616	18	14	13	14	12	18	19	24	22	24	28	31	33	34	32	32	132	144	105	105	70	42	31	45	144	43
	20180617	34	79	104	85	69	53	34	21	26	23	31	17	25	23	84	221	483	220	79	42	33	28	36	20	**483**	77
	20180618	24	12	15	17	37	50	47	35	30	38	37	38	43	48	29	17	17	20	20	35	63	33	37	21	63	31
YUMA AZ SUPERSITE (PST)	20180616	6	7	7	7	12	16	12	11	53	67	53	34	31	29	29	27	29	30	57	41	27	23	20	28	67	27
	20180617	24	23	30	29	28	30	29	27	28	25	24	20	20	20	18	22	31	31	118	139	81	41	34	29	**139**	37
	20180618	25	25	31	31	45	62	50	27	41	42	42	35	25	52	28	44	23	16	33	47	40	41	53	75	75	38
YUMA AZ SUPERSITE (MST)	20180616	11	6	7	7	7	12	16	12	11	53	67	53	34	31	29	29	27	29	30	57	41	27	23	20	67	26
	20180617	28	24	23	30	29	28	30	29	27	28	25	24	20	20	20	18	22	31	31	118	139	81	41	34	**139**	37
	20180618	29	25	25	31	31	45	62	50	27	41	42	42	35	25	52	28	44	23	16	33	47	40	41	53	62	36

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

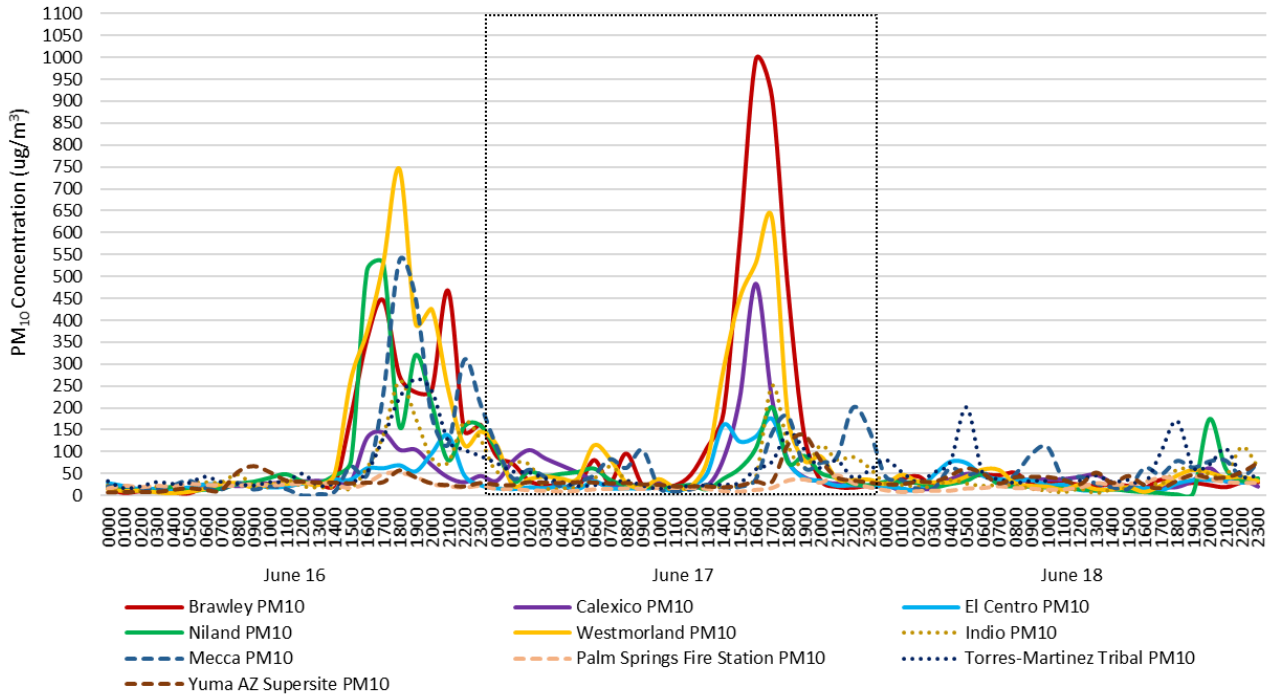


Fig 2-2: is a three-day graphical representation of the PM_{10} concentrations measured at the sites identified in **Table 2-1**. Elevated concentrations are consistent with each other

Wind speed, wind direction and the airflow patterns combined all help explain how windblown emissions resulting from the strong gusty westerly winds affected the all of the monitors in Imperial County on Sunday, June 17, 2018.

As mentioned above, the early weather forecast notices issued by both the San Diego and Phoenix NWS offices indicated that a low pressure system moving over California would strengthen the onshore pressure gradient and generate strong gusty westerly winds across portions of southeastern California. Wind gusts across southeast California were forecast to reach 20-30 mph[13,14] while gusts through east-west mountain passes of the San Diego County mountains were forecast to be 40 to 50 mph (**Appendix A**).

Figures 2-3 and 2-4 depict the compiled wind data for regional and neighboring airports and upstream sites. Starting midday on June 17, 2018 all airports depicted measured wind speeds at or above 25 mph along with wind gusts at or above 25 mph, all coincident with measured elevated concentrations.

[13] National Weather Service, Area Forecast Discussion, June 17, 2018, Phoenix office, 239pm MST
[14] National Weather Service, Area Forecast Discussion, June 17, 2018, San Diego office, 200pm PST

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

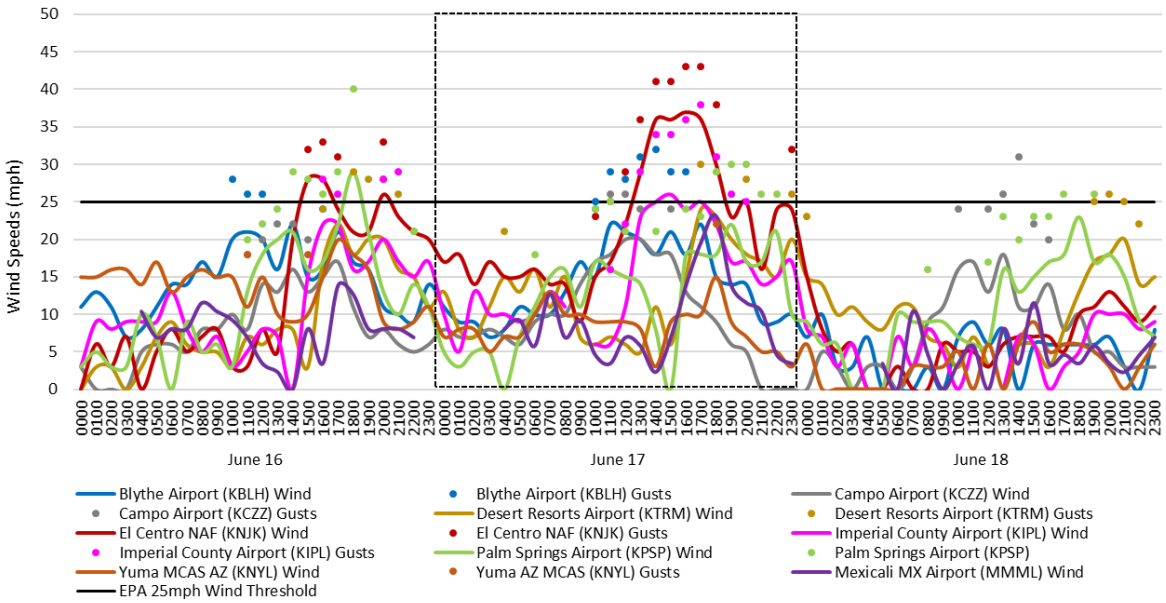


Fig 2-3: is a three-day graphical representation of the measured wind speed and wind gusts (if available) from local and neighboring airports. All data derived from the Local Climatological Data Hourly Observations (LCDHO) reports released by the NOAA https://www.ncdc.noaa.gov/. MMML is from the University of Utah's Meso West https://mesowest.utah.edu/index.html

FIGURE 2-4
WIND SPEEDS AND GUST UPSTREAM SITES

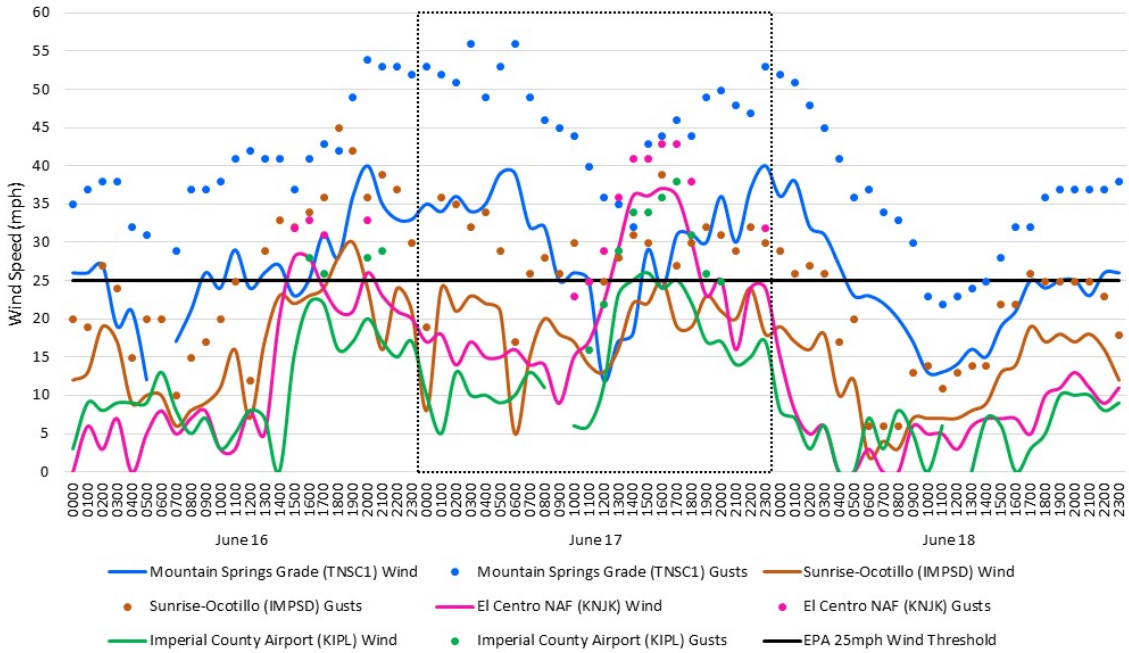


Fig 2-4: is a three-day graphical representation of the measured wind speed and wind gust (if available) from sites located upwind from the monitors in Imperial County monitors. All data derived from the University of Utah's Meso West https://mesowest.utah.edu/index.html

The National Oceanic and Atmospheric Administration (NOAA) Laboratory HYSPLIT back-trajectory models[15] provide supporting evidence of the westerly airflow within Imperial County on June 17, 2018. The HYSPLIT back-trajectory models in **Figures 2-5 and 2-6** depict the airflow during the afternoon (1300 PST) and the late afternoon (1600 PST) to help illustrate the westerly airflow.

Figure 2-5 depicts the westerly airflow coincident with elevated concentrations above 100 µg/m^3 at the Brawley monitor. **Figure 2-6** depicts the westerly airflow coincident with peak hourly measured concentration at the Brawley monitor.

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

FIGURE 2-5
HYSPLIT MODEL All SITES JUNE 17, 2018 1300 PST

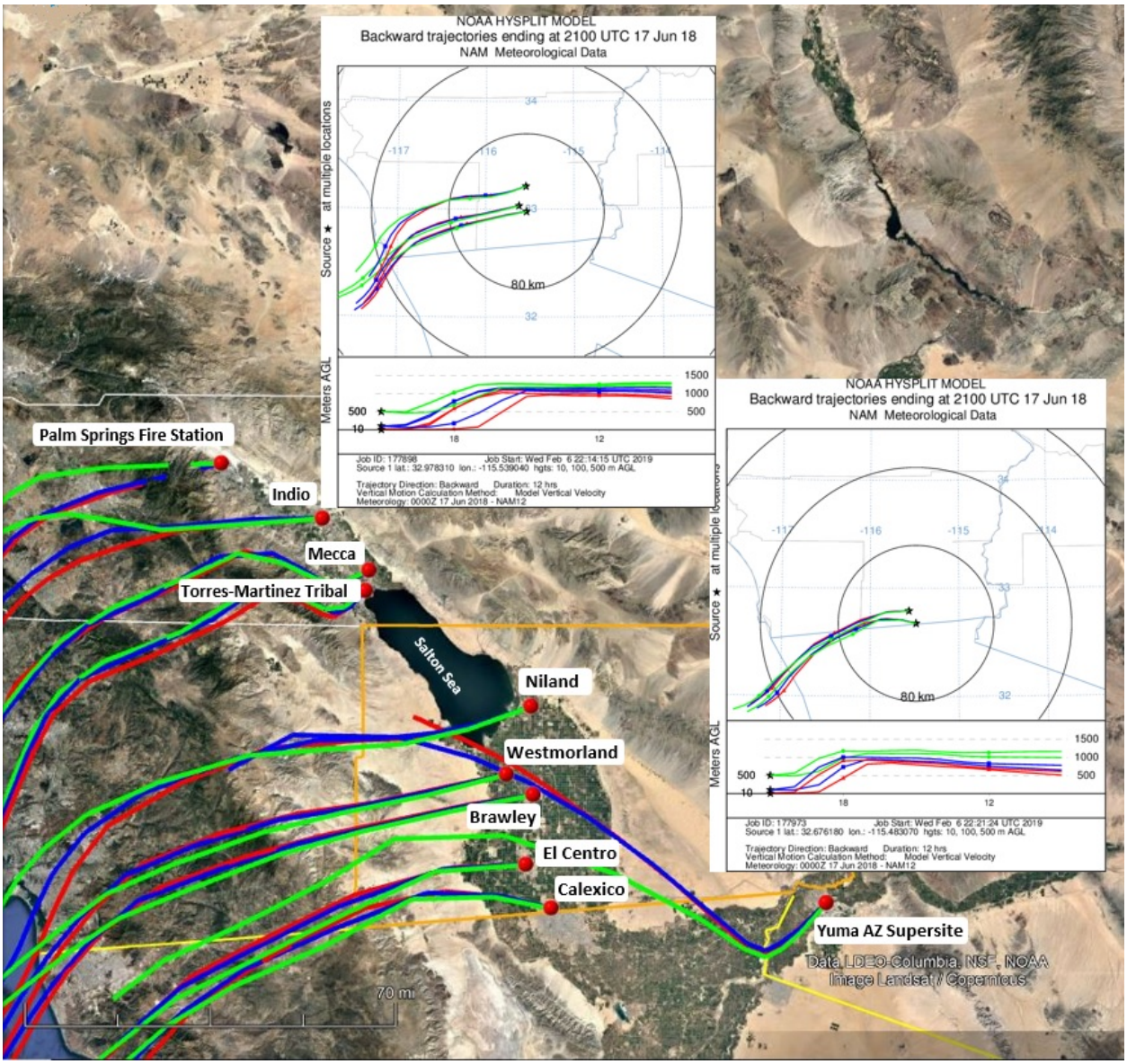


Fig 2-5: A 12-hour HYSPLIT back-trajectory ending at 1300 PST for all sites identified in **Table 2-1**. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

FIGURE 2-6
HYSPLIT MODEL All SITES JUNE 17, 2018 1600 PST

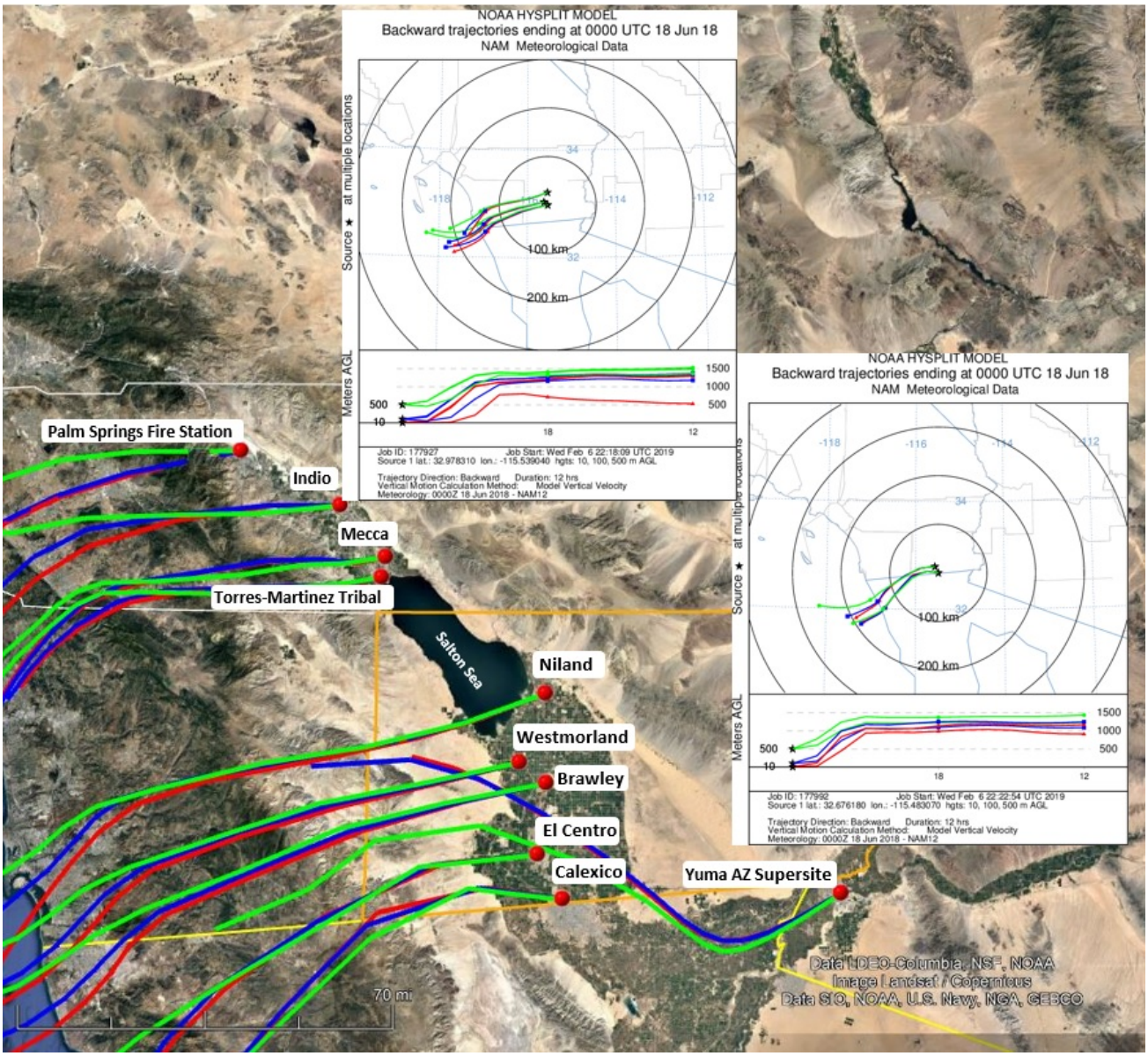


Fig 2-6: A 12-hour back-trajectory HYSPLIT ending at 1600 PST for all sites identified in **Table 2-1**. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

As strong gusty westerly winds blew over open natural desert areas west of Imperial County, fugitive windblown dust affected a majority of the air quality monitors within the southeastern region. On June 17, 2018 both local airports measured wind speeds or gust at or above 25 mph with the El Centro NAF (KNJK) measuring a peak wind speed of 37 mph and a peak gust of 43 mph. The Imperial County Airport (KIPL) measured peak winds of 26 mph and a peak gust of 38 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, an unusually deep trough moved over the region and brought cooler than average temperatures, strengthened the surface pressure gradient, and produced gusty westerly winds within the San Diego County mountains and deserts.[16,17] Gusts over 50 mph blew over the higher terrain within the San Diego County Mountains and along Interstate 8, the Grade, into Imperial County.[18,19,20] The gusty westerly winds created blowing dust concerns.[21,22] On June 17, blowing dust was observed in Imperial County due to wind gusts of 50 mph or more over the mountains and deserts of San Diego County.[23] Blowing dust was also observed by satellite imagery near the Salton Sea being transported toward the Nevada and Arizona state borders (**Appendix C**). More monitors would have exceeded if not for the moisture in the cool weather system. El Centro NAF (KNJK) measured trace precipitation starting at 1156 PST for every hour but one for the remainder of the day.

While elevated wind speeds play a significant and important role in the transportation of dust, gusts and precipitation play an equally significant role in the deposition of particulates onto a monitor and the overall affect onto ambient air.[24] As winds and gusts increased on June 17, 2018 and transported windblown dust from open natural mountains and deserts into Imperial County air quality degraded. As mentioned in Section I.1 above, the ICAPCD issued an advisory of the potential for elevated particulate matter and the potential of degradation of air quality to a moderate or unhealthy level. In addition, the NWS service issued Area Forecast Discussions advising of the potential for increased winds and the associated impacts such as patchy blowing dust and blowing sand.

Figure 3-1 below provides illustrations of morning meteorological conditions, as described above and demonstrated in the HYSPLITs, for June 17, 2018, which affected air quality in Imperial County causing an exceedance at the Brawley monitor.

[16] National Weather Service, Area Forecast Discussion, June 16, 2018, San Diego office, 930am PST
[17] National Weather Service, Area Forecast Discussion, June 17, 2018, Phoenix office, 1246pm MST
[18] National Weather Service, Area Forecast Discussion, June 16, 2018, San Diego office, 200pm PST
[19] National Weather Service, Area Forecast Discussion, June 17, 2018, San Diego office, 258am PST
[20] National Weather Service, Area Forecast Discussion, June 16, 2018, Phoenix office, 117pm MST
[21] National Weather Service, Area Forecast Discussion, June 16, 2018, Phoenix office, 315pm MST
[22] National Weather Service, Area Forecast Discussion, June 16, 2018, San Diego office, 906pm PST
[23] National Weather Service, Area Forecast Discussion, June 17, 2018, San Diego office, 913pm PST
[24] 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

FIGURE 3-1
VISUAL RAMP-UP ANALYSIS AS DISCUSSED FOR JUNE 17, 2018

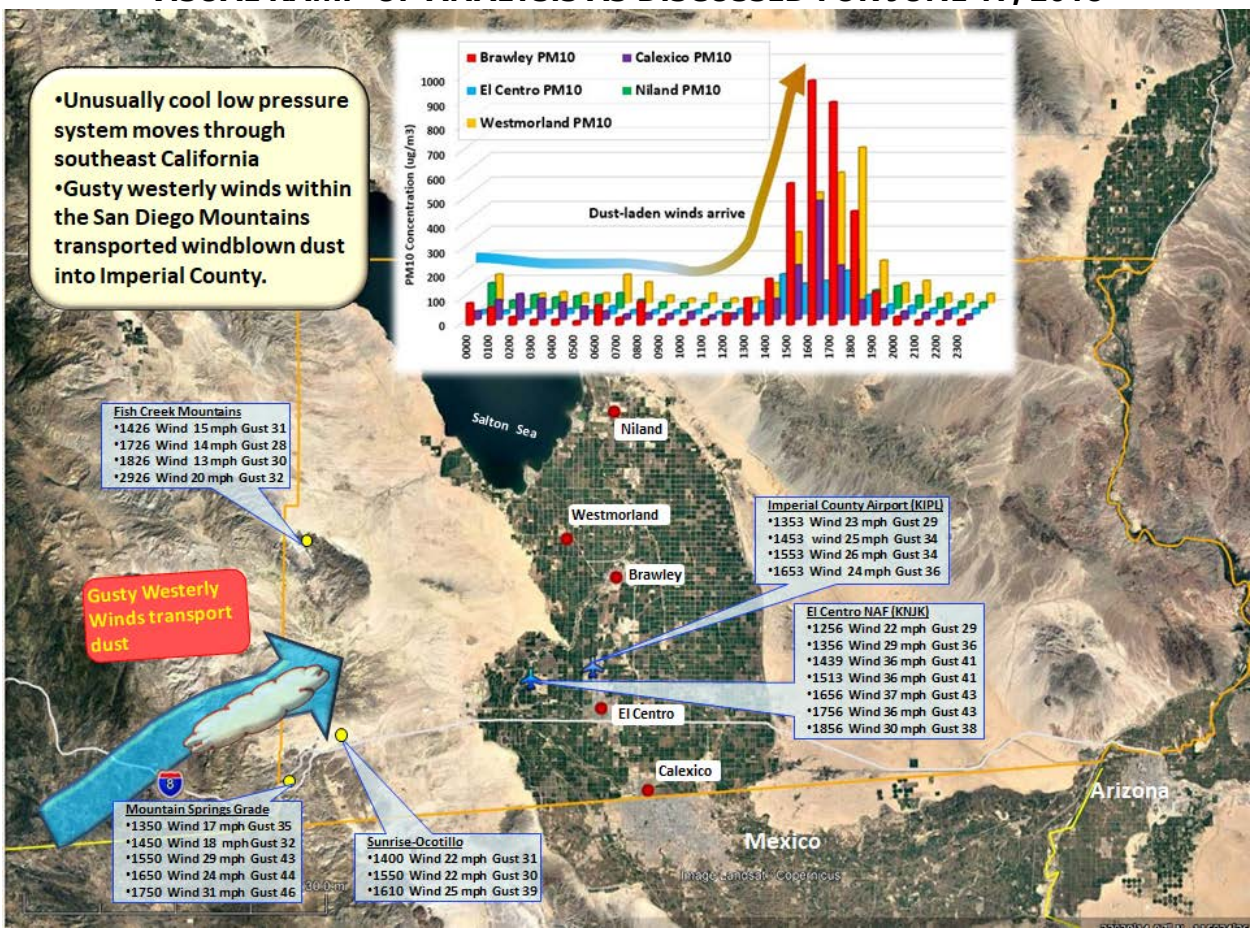


Fig 3-1: On June 17, 2018, strong winds blew over and along the San Diego Mountains and along Mountain Springs Grade within the I-8 corridor into Imperial County affecting the air quality monitors in Imperial County, but specifically the Brawley monitor. Google Earth base map

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 so. The El Centro NAF (KNJK) and Imperial County Airport (KIPL) both reported reduced visibility coincident with elevated wind speeds, wind gusts and elevated hourly concentrations of particulates at all air quality monitors. **Figure 3-2** and **Tables 3-1 through 3-2** provide information regarding the reduced visibility in Imperial County and the relation to hourly concentrations at local air monitors.

While **Figure 3-2** is a graphical representation of the reduced visibility within Imperial County and surrounding areas, **Tables 3-1 through 3-2** provide a temporal relationship of wind speeds, wind direction, wind gusts (if available), and PM_{10} concentrations at the

Brawley monitor. Together, the data provides the supporting relationship between the elevated winds, blowing dust and reduced visibility.

According to the compiled information found in **Figure 3-2** visibility reduced at both of the local airports, the El Centro NAF (KNJK) and the Imperial County Airport (KIPL), on June 17, 2018 coincident with elevated hourly concentrations at the air quality monitors in Imperial County.

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

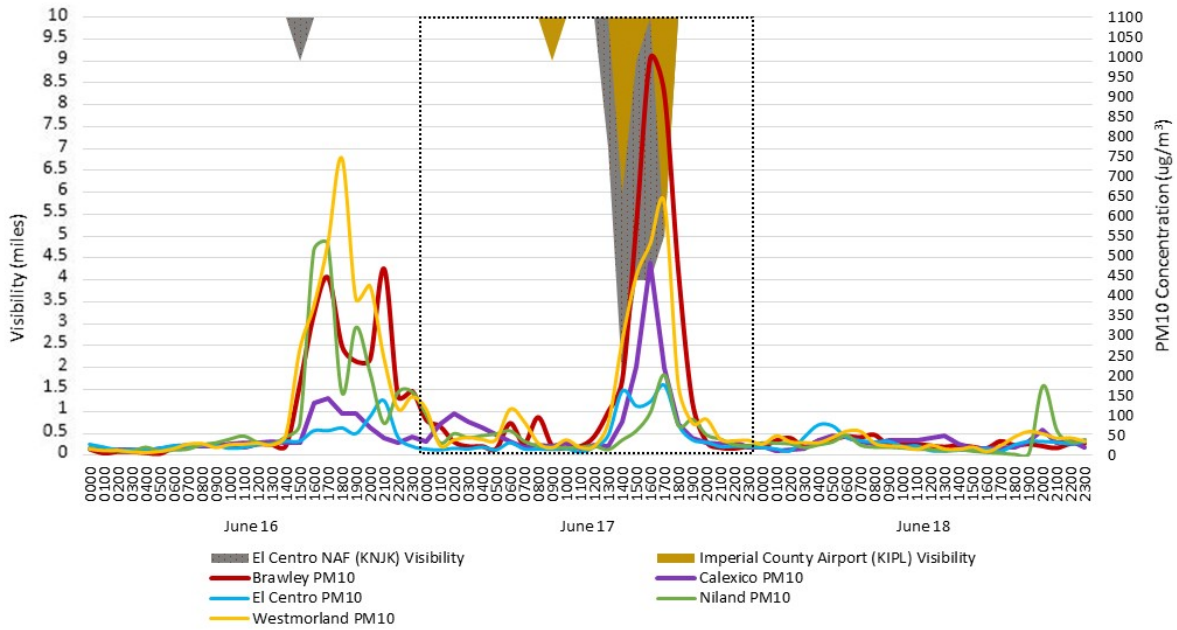


Fig 3-2: is a graphical representation of the compiled data from the Imperial County Airport (KIPL) and the El Centro NAF (KNJK). Reported reduced visibility is coincident with elevated winds and hourly levels of concentrations either just prior to peak concentrations or after. Visibility data from the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

Because the EPA accepts a high wind threshold for sustained winds of 25 mph in California and 12 other states[25] the **Tables 3-1 through 3-2** 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 of the exceeding monitors, with a final table comparing select meteorological sites with all monitors.

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

TABLE 3-1
WIND SPEED AND PM_{10} CONCENTRATIONS JUNE 17, 2018

	MOUNTAIN SPRINGS GRADE (TNSC1)			SUNRISE-OCOTILL0 (IMPSD)			FISH CREEK MOUNTAINS (FHCC1)			EL CENTRO NAF (KNJK)			IMPERIAL COUNTY AIRPORT (KIPL)			BRAWLEY
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}
000	35	53	217	8	19	291	16	22	206	17		260	10		270	89
100	34	52	217	24	36	215	13	23	200	18		270	5		260	72
200	36	51	213	21	35	236	16	22	207	14		250	13		270	33
300	34	56	204	23	32	230	19	24	205	17		260	10		280	22
400	35	49	211	22	34	248	14	24	205	15		260	10		260	22
500	39	53	206	21	29	245	13	19	197	15		270	9		270	16
600	39	56	205	5	17	242	13	22	191	16		270	10		260	80
700	32	49	217	15	26	241	14	22	198	14		270	13		280	29
800	32	46	218	20	28	220	15	20	194	14		270	11		320	95
900	25	45	211	18	26	233	10	20	210	9		290				23
1000	26	44	221	17	30	242	5	13	38	15	23	280	6		310	19
1100	25	40	224	14	25	235	6	13	197	17	25	250	6	16	300	22
1200	12	36	220	13	25	257	3	13	134	22	29	260	11	22	VRB	47
1300	17	35	249	16	28	248	9	15	5	29	36	260	23	29	260	109
1400	18	32	235	22	31	245	15	31	256	36	41	260	25	34	270	188
1500	29	43	224	22	30	241	11	24	270	36	41	250	26	34	260	577
1600	24	44	245	25	39	235	13	22	267	37	43	260	24	36	270	995
1700	31	46	217	19	27	247	14	28	254	36	43	260	25	38	260	908
1800	31	44	222	19	30	246	13	30	244	30	38	250	22	31	260	464
1900	30	49	209	23	32	227	16	22	213	23		250	17	26	260	134
2000	36	50	206	21	31	236	20	32	220	25		260	17	25	260	34
2100	30	48	214	20	29	243	13	29	205	16		270	14		270	19
2200	37	47	209	24	32	229	12	20	193	24		260	15		270	17
2300	40	53	207	18	30	242	23	30	200	24	32	260	17		270	22

Wind data for KIPL and KNJK from the NCEI's QCLCD system. Wind data for Fish Creek Mountains (FHCC1), Mountain Springs Grade (TNSC1), and Sunrise-Ocotillo (IMPSD) from the University of Utah's MesoWest system https://mesowest.utah.edu/index.html. Wind speeds = mph; Direction = degrees. Due to the different times that wind data and air quality data is sampled at various sites, the hour given represents the hour in which the measurement was taken

TABLE 3-2
WIND SPEED AND PM_{10} CONCENTRATIONS JUNE 17, 2018

	MOUNTAIN SPRINGS GRADE (TNSC1)			SUNRISE-OCOTILL0 (IMPSD)			EL CENTRO NAF (KNJK)			IMPERIAL COUNTY AIRPORT (KIPL)			WSTMLD	BRAWLEY	NLND	EC	CX
HOUR	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/G	W/D	PM_{10} (UG/M³)				
000	35	53	217	8	19	291	17		260	10		270	116	89	103	16	34
100	34	52	217	24	36	215	18		270	5		260	24	72	32	14	79
200	36	51	213	21	35	236	14		250	13		270	38	33	55	18	104
300	34	56	204	23	32	230	17		260	10		280	44	22	45	16	85
400	35	49	211	22	34	248	15		260	10		260	39	22	50	21	69
500	39	53	206	21	29	245	15		270	9		270	39	16	54	14	53
600	39	56	205	5	17	242	16		270	10		260	115	80	62	32	34
700	32	49	217	15	26	241	14		270	13		280	84	29	36	16	21
800	32	46	218	20	28	220	14		270	11		320	30	95	24	16	26
900	25	45	211	18	26	233	9		290				18	23	21	15	23
1000	26	44	221	17	30	242	15	23	280	6		310	38	19	19	17	31
1100	25	40	224	14	25	235	17	25	250	6	16	300	19	22	21	9	17
1200	12	36	220	13	25	257	22	29	260	11	22	VRB	22	47	24	21	25
1300	17	35	249	16	28	248	29	36	260	23	29	260	81	109	15	51	23
1400	18	32	235	22	31	245	36	41	260	25	34	270	288	188	39	162	84
1500	29	43	224	22	30	241	36	41	250	26	34	260	450	577	62	124	221
1600	24	44	245	25	39	235	37	43	260	24	36	270	531	995	108	135	483
1700	31	46	217	19	27	247	36	43	260	25	38	260	633	908	202	176	220
1800	31	44	222	19	30	246	30	38	250	22	31	260	173	464	75	77	79
1900	30	49	209	23	32	227	23		250	17	26	260	80	134	91	39	42
2000	36	50	206	21	31	236	25		260	17	25	260	90	34	52	33	33
2100	30	48	214	20	29	243	16		270	14		270	39	19	41	22	28
2200	37	47	209	24	32	229	24		260	15		270	36	17	27	23	36
2300	40	53	207	18	30	242	24	32	260	17		270	37	22	24	22	20

Wind data for KIPL and KNJK from the NCEI's QCLCD system. Wind data for Fish Creek Mountains (FHCC1), Mountain Springs Grade (TNSC1), and Sunrise-Ocotillo (IMPSD) from the University of Utah's MesoWest system https://mesowest.utah.edu/index.html. 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, Area Forecast Discussions and the NOAA Smoke Text Product that identified blowing dust south of the Salton Sea, all described the gusty westerly winds and blowing dust for the region extending from the San Diego County Mountains and deserts, Imperial County and western Arizona. The low-pressure system strengthened the pressure gradient and produced strong gusty westerly winds affected different regional air monitors in Riverside County, Imperial County and southwest 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.[26] As transported windblown dust entered

[26] 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

Imperial County on the afternoon of June 17, 2018, air quality degraded in Imperial County. Overall, the strong gusty westerly winds associated with the low pressure system affected air quality in Imperial County.

FIGURE 3-3
IMPERIAL VALLEY AIR QUALITY INDEX FOR BRAWLEY
JUNE 17, 2018

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

III.1 Summary of Forecasts and Warnings

Area Forecast Discussions issued by the NWS offices in Phoenix and San Diego described strong gusty westerly winds that would occur due to a low-pressure system moving through the region. The westerly flow over the San Diego County Mountains enhanced the downslope effect along the desert mountain slopes transporting windblown dust into Imperial County. Additionally, several Area Forecast Discussions either mentioned the likelihood of areas of blowing dust or identified occurrences of blowing dust across Imperial County. **Appendix A** contains all pertinent NWS notices.

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

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 upwind from the monitors. Data analysis indicates that on June 17, 2018 different sites measured wind speeds at or above and some far in excess of 25 mph.

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

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

Figures 4-1 to 4-2 show the time series of available FRM and BAM 24-hr PM_{10} concentrations at the Brawley air quality monitor for the period of January 1, 2010 through June 17, 2018. 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).[27] 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 June 17, 2018, as measured by the Brawley monitor, were used to establish the historical and seasonal variability over time.[28] All figures illustrate that the exceedance, which occurred on June 17, 2018, 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.

[27] 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.

[28] FRM sampling ended December 2016.

FIGURE 4-1
BRAWLEY HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO JUNE 17, 2018

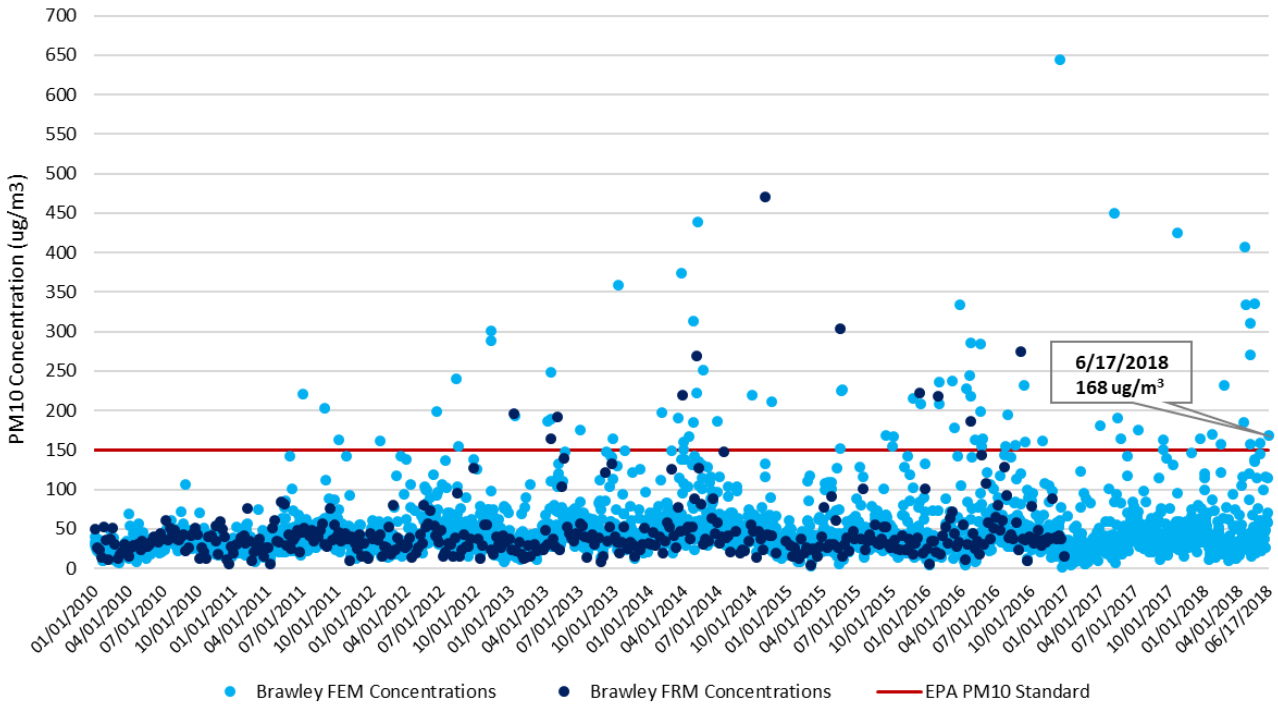
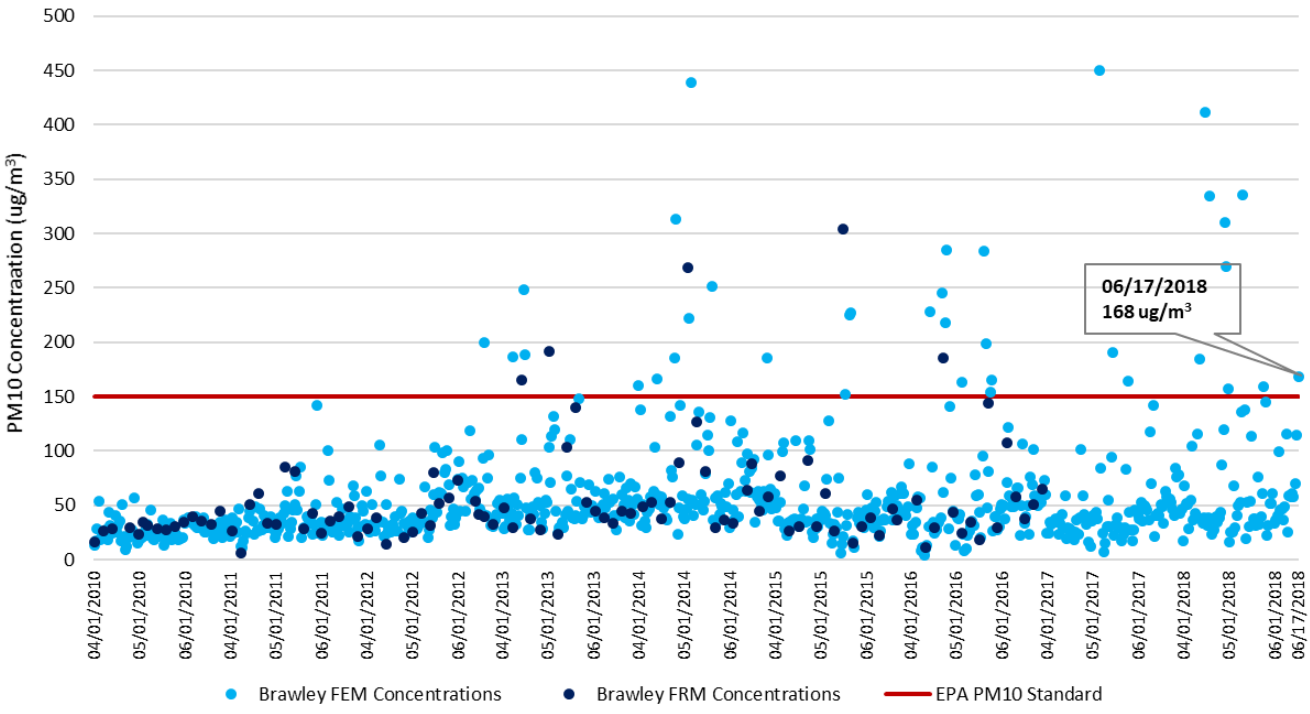


Fig 4-1: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 168 µg/m^3 on June 17, 2018 by the Brawley monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-1,** for Brawley includes 3,090 sampling days (January 1, 2010 through June 17, 2018). During the January 1, 2010 through June 17, 2018 period, the Brawley monitor measured 79 exceedance days out of 3,090 sampling days, which translates into an occurrence rate less than 3%. Historically, there were fourteen (14) exceedance days measured during the first quarter; thirty-six (36) exceedance days measured during the second quarter; sixteen (16) exceedance days measured during the third quarter; and thirteen (13) 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 JUNE 17, 2018**



***Quarterly: April 1, 2010 to June 30, 2017 and April 1, 2018 to June 17, 2018**

Fig 4-2: A comparison of PM_{10} seasonal concentrations demonstrate that the measured concentration of 168 µg/m^3 by the Brawley monitor on June 17, 2018 was outside the normal seasonal concentrations when compared to similar days and non-event days

Figure 4-2 illustrates the seasonal fluctuations over a period of 806 sampling days, 909 credible samples and thirty-six (36) exceedance days. This translates to less than a 3.9% seasonal exceedance occurrence rate.

Examining the historical and seasonal time series concentrations as they relate to the June 17, 2018 measured exceedances, the exceedances measured on June17, 2018 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 southwest of Imperial County. The origination of these emissions from these areas affected all the air quality monitors significantly on June 17, 2018. Since Imperial County does not have jurisdiction over emissions emanating from San Diego County, it is not reasonably controllable or preventable by Imperial County. For a brief description of the controls implemented by sources beyond the control of Imperial County see section V.1 below.

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

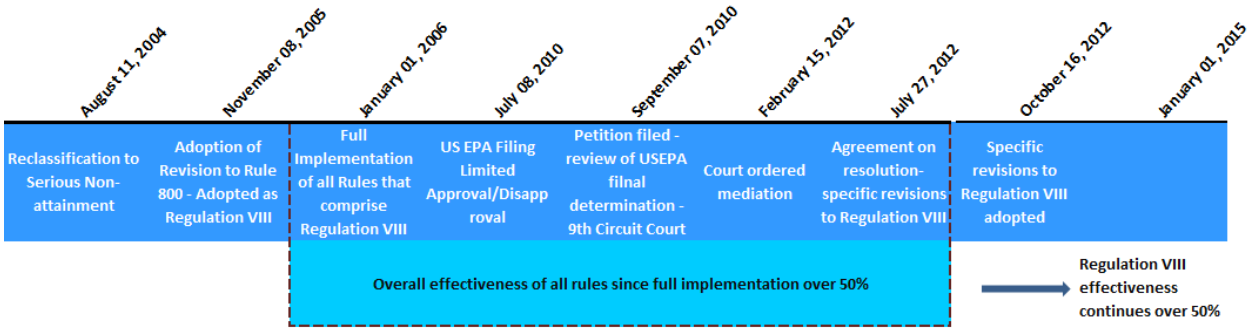


Fig 5-1: Regulation VIII Graphic Timeline

V.1 Other PM_{10} Control Measures

In addition to the rules and regulations listed above, other PM_{10} control measures have been committed to, and implemented by, local California air districts bordering ICAPCD. San Diego County (to the west of Imperial County) and eastern Riverside County (outside

of the Coachella Valley Planning Area and to the north and northeast of Imperial County) are both designated unclassified for the PM_{10} NAAQS and are not required to have BACM controls for PM_{10}. The Coachella Valley Planning Area in Riverside County, to the north and northwest of Imperial County, is designated a PM_{10} nonattainment area, and a redesignation request and maintenance plan were submitted to USEPA in 2010. These three areas and their relevant PM_{10} rules are indicated in **Tables 5-1 to 5-3**.

TABLE 5-1
SAN DIEGO AIR POLLUTION CONTROL DISTRICT (SDAPCD)

RULES REGULATING EXISTING AND NEW NON-POINT SOURCES IN SAN DIEGO COUNTY	
RULE NUMBER AND TITLE	DESCRIPTION
Rule 52 – Particulate Matter	Limits the amount of particulate matter that may be discharged from any source.
Rule 52.1 – NSPS and NESHAPS Particulate Matter Requirements	Ensures that sources subject to NSPS or NESHAPS also conform to Regulation X and XI, respectively.
Rule 54 – Dust and Fumes	Minimizes the amount of dust that can be discharged in a specified time period.
Rule 55 – Fugitive Dust Control	Provides a mechanism to regulate operations that may cause fugitive dust emissions.
Rule 101 – Burning Control	Establishes conditions, including high winds, under which burning would be curtailed or prohibited.

TABLE 5-2
MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT (AQMD)

RULES REGULATING EXISTING AND NEW NON-POINT SOURCES IN EASTERN RIVERSIDE COUNTY OUTSIDE OF THE COACHELLA VALLEY PLANNING AREA	
RULE NUMBER AND TITLE	DESCRIPTION
Rule 403 – Fugitive Dust	Limits the amount of particulate matter that may be discharged from specific sources, not including unpaved public roads or farm roads, or industrial or commercial facilities.
Rule 404 – Particulate Matter Concentration	Limits the concentration of PM_{10} allowed in discharged gas.
Rule 405 – Solid Particulate Matter Weight	Limits the amount of PM_{10} that can be discharged on an hourly basis.

TABLE 5-3
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)

RULES REGULATING EXISTING AND NEW NON-POINT SOURCES IN RIVERSIDE COUNTY AND THE COACHELLA VALLEY, INSIDE OF THE COACHELLA VALLEY PLANNING AREA	
RULE NUMBER AND TITLE	DESCRIPTION
Rule 403– Fugitive Dust	Requires implementation of control measures to prevent, reduce, or mitigate fugitive dust emissions.
Rule 403.1 – Supplemental Fugitive Dust Control Requirements for Coachella Valley Sources	Establishes special requirements for Coachella Valley dust sources under high-wind conditions and requires SCAPCD approval of dust control plans for sources not subject to local government ordinances.
Rule 1156 – Further Reductions of Particulate Emissions from Cement Manufacturing Facilities	Establishes requirements to reduce particulate matter emissions from cement manufacturing operations and properties.
Rule 1157 – PM_{10} Emission Reductions from Aggregate and Related Operations	Establishes additional source specific performance standards and specifies operational PM_{10} controls specific to aggregate and related operations.
Rule 1186 – PM_{10} Emissions from Paved and Unpaved Roads and Livestock Operation	Limits the amount of particulate matter entrained as a result of vehicular travel on paved and unpaved public roads, and at livestock operations.
Rule 1466 – Control of Particulate Emissions from Soils with Toxic Air Contaminants	Establishes a PM_{10} ambient dust concentration limit, dust control measures, and notification requirements prior to earth-moving activities or when PM_{10} dust concentrations are exceeded.

V.2 Wind Observations

As previously discussed, wind data analysis indicates that on June 17, 2018 different sites measured wind speeds at or above and 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 June 17, 2018 event, wind speeds were above the 25 mph threshold, overcoming the reasonable controls in place.

V.3 Review of Source Permitted Inspections and Public Complaints

A query of the ICAPCD permit database was compiled and reviewed for active permitted sources throughout Imperial County and specifically around the Brawley monitor during the June 17, 2018 PM_{10} exceedances. 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, officially declared as a No Burn Day, related to agricultural burning, waste burning or dust.

FIGURE 5-2
PERMITTED SOURCES

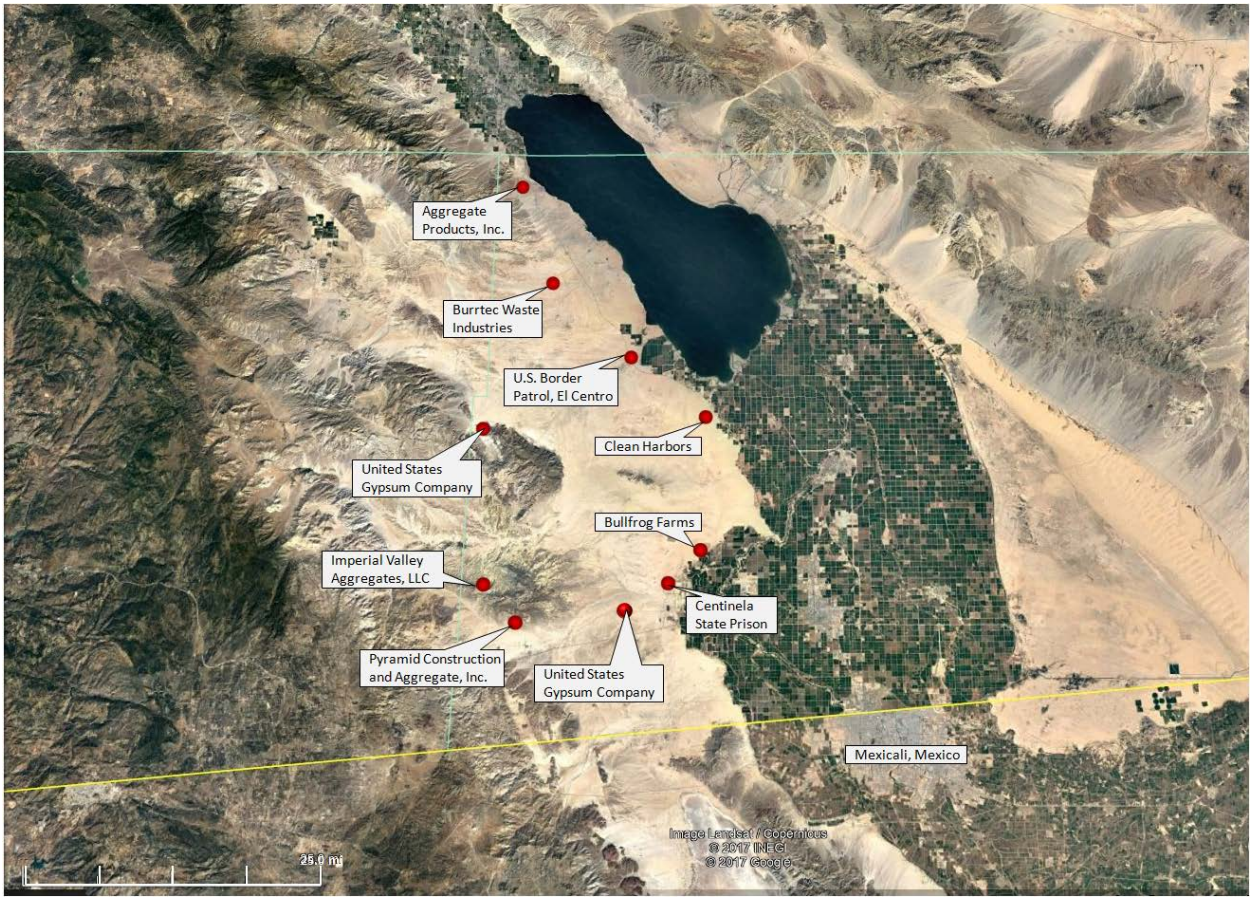


Fig 5-2: The above map identifies those permitted sources located west, northwest and southwest of the Brawley monitor. The green line to the north denotes the political division between Imperial and Riverside counties. The yellow line below denotes the international border between the United States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

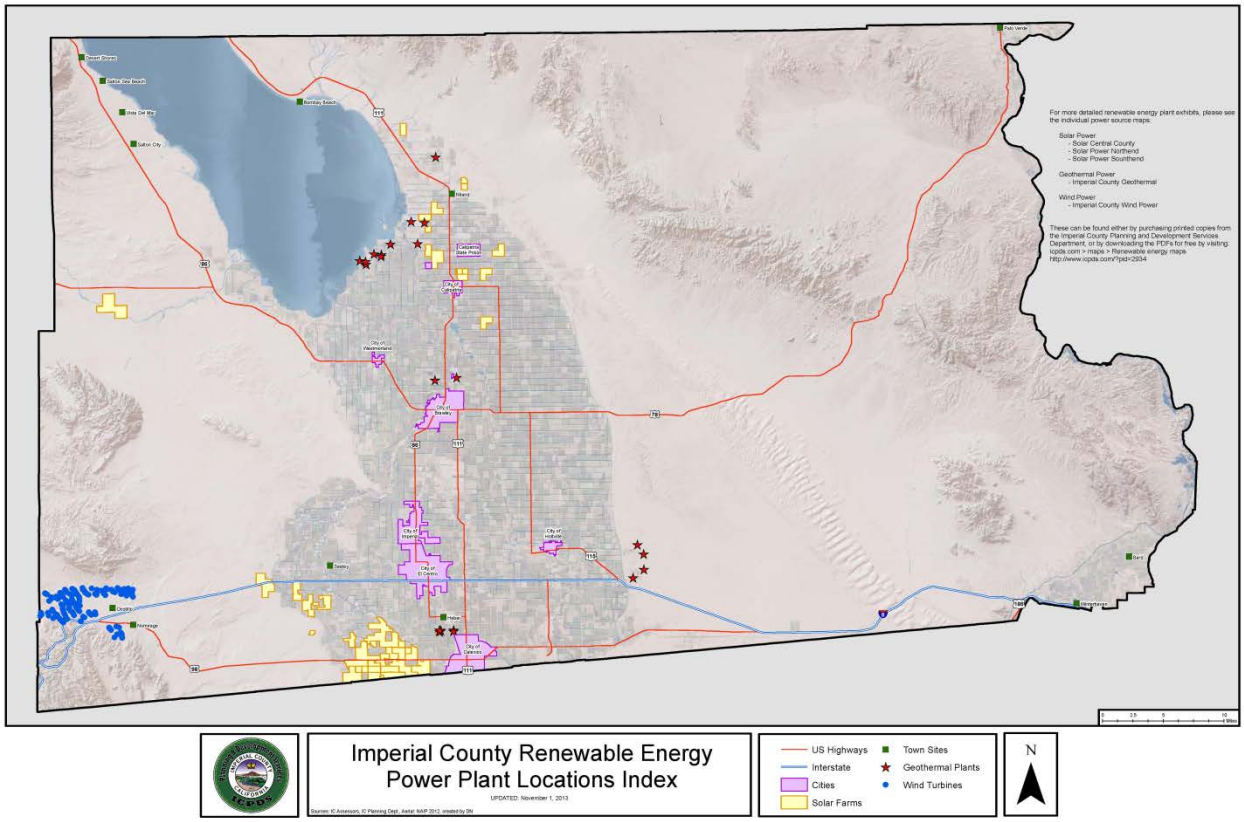


Fig 5-3: The above map identifies those power sources located west, northwest and southwest of the Brawley monitor. Blue indicate the Wind Turbines, Yellow are the solar farms and stars are geothermal plants

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.

Although not typical for this time of month, Pacific weather disturbances will bring westerly winds within the region. The Pacific low-pressure system that moved over southern California and strengthened the surface pressure gradient produced gusty westerly winds the blew over and within the San Diego County Mountains transporting dust into Imperial County (**Table 2-1**).

Although no advisories were issued by either the San Diego or Phoenix NWS offices, there was still discussion that the westerly flow across the San Diego County Mountains would promote stronger gustier winds along Interstate-8 near Mountain Springs causing patchy blowing dust and sand.[29] The cool and moist weather system dropped enough moisture within the San Diego County Mountains allowing for less saltation and deposition of particulates onto the air quality monitors. In addition, trace precipitation was measured throughout most of the day at the El Centro NAF (KNJK) (**Table 6-1**). The increased moisture in the air reduced the amount of transported emissions and helped to reduce suspended dust, hence the low 24-hr concentrations at all the monitors including the Brawley monitor (**Figure 6-1**). First, both the Westmorland and Brawley monitors measured 24-hr concentrations over 100 µg/m^3, this is coincident with few obstructions to the natural open deserts and mountains to the west. Second, both the Calexico and El Centro monitors are surrounded with greater urbanization and are surrounded either by extensive developed farmland or in the case of Calexico the City of Mexicali. In this instance, Mexicali would similarly have benefited from the rain keeping dust emissions lower. Finally, the reduced measured 24-hr averaged concentration at the Brawley monitor provides some support to the reduced transported dust emissions into Imperial County.

TABLE 6-1

PRECIPITATION TOTALS	
LOCATION*	**6/17/2018**
El Centro NAF (KNJK) (trace precipitation measured at the airfield starting 1156 PST through remainder of day except one hour)	Trace

*KNJK from QCLCD

[29] National Weather Service, Area Forecast Discussion, June 17, 2018, San Diego office, 258am PST

FIGURE 6-1
PRECIPITATION AND REDUCED EMISSIONS

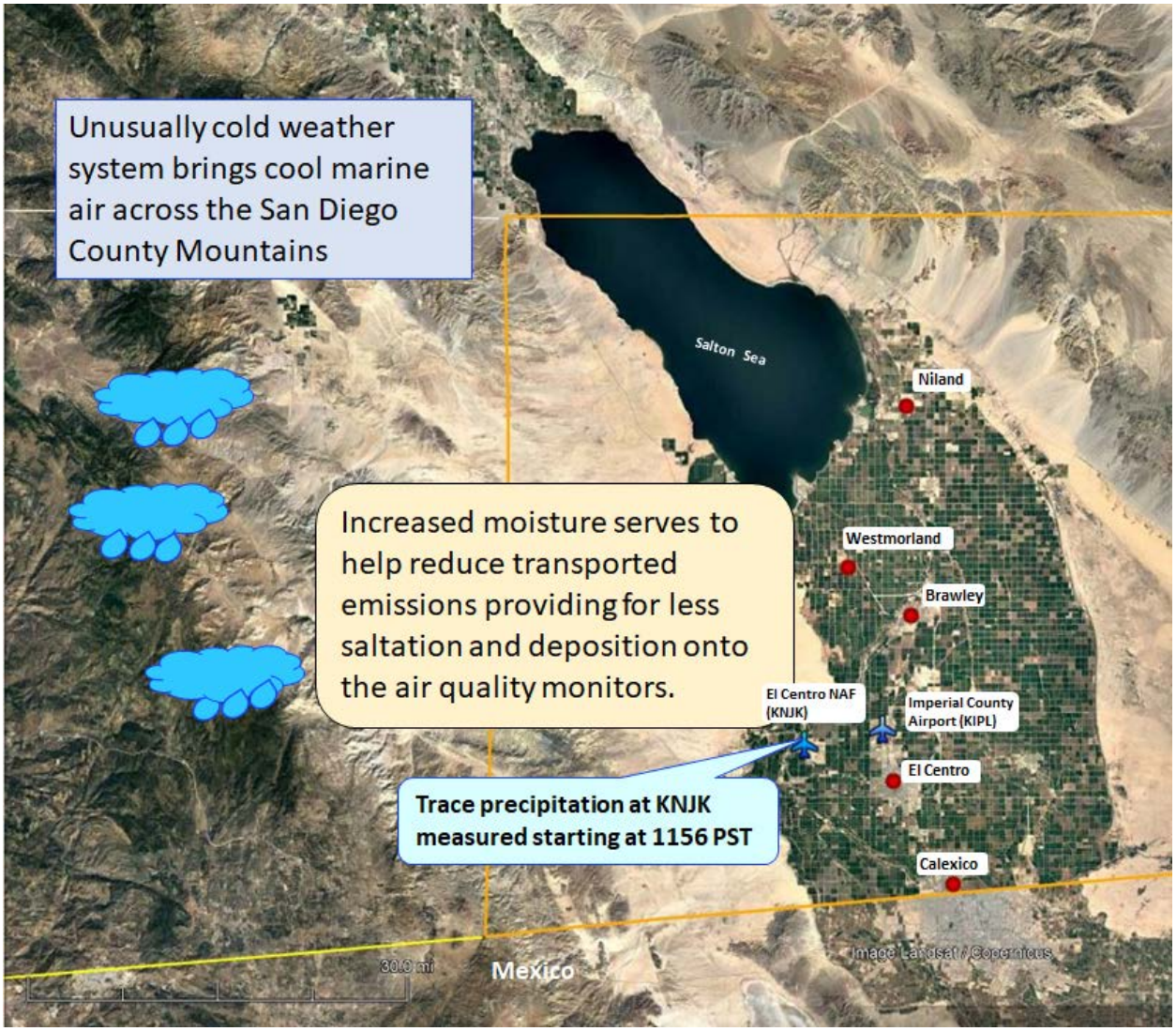


Fig 6-1: An unusually cold weather system contained enough moisture to make it across the San Diego County Mountains providing for less transported emissions. Trace precipitation was measured at KNJK starting at 1156 PST and continuing through the day for all but one hour

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 June 17, 2018 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 reasonable controls, 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 County where Imperial County has no jurisdiction. In any event, despite reasonable controls in place within Imperial County, high winds overwhelmed all reasonable controls where human activity played little to no direct causal role. In any event, despite reasonable controls in place within Imperial County, high winds overwhelmed all reasonable controls where human activity played little to no direct causal role. The PM_{10} exceedances 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 located within the Sonoran Desert regions to the southwest and west of Imperial County. These facts provide strong evidence that the PM_{10} exceedance at the Brawley monitor on June 17, 2018, 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 the Brawley monitor on June 17, 2018, was caused by the transport of windblown dust into Imperial County by strong gusty westerly winds associated with a large low-pressure system that passed through the region. At the time of the event, anthropogenic sources, within Imperial County were reasonably controlled. 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 June 17, 2018. 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 June 17, 2018.

VI.5 Concentration to Concentration Analysis

The historical annual and seasonal 24-hr average PM_{10} measured concentrations at the Brawley monitor 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 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 air quality monitor in Imperial County on June 17, 2018.

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 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.[30]

[30] 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.