IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

International Border with Mexico A smoggy haze hovers over Mexicali, affecting Imperial County air quality
https://www.thedesertreview.com/announcements/county-to-hold-air-pollution-workshop/article_f66d9e46-78d0-11e9-ad02-1b92cc45ebb2.html

June 28, 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 Niland monitor in Imperial County, California on June 28, 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 Thursday, June 28, 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. On Tuesday and Wednesday, June 26 and June 27, 2018, the ICAPCD published advisories concerning the potential for elevated concentrations of particulate matter caused by gusty westerly winds preceding the passage of a trough of low-pressure by Thursday, June 28, 2018. Although brisk westerly winds were forecast for the area, neither the San Diego nor the Phoenix NWS offices issued advisories and neither office spent much time discussing the winds on Thursday, June 28, 2018. **Appendix C** contains copies of notices pertinent to the June 28, 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 Thursday, June 28, 2018, a naturally occurring event elevated particulate matter within San Diego, Riverside and Imperial Counties, causing an exceedance at the Niland (06-025-4004) 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 Niland monitor on June 28, 2018. After review, CARB submitted the INPEE, for the June 28, 2018 event in July of 2019. The submitted request included a brief description of the meteorological conditions for June 28, 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 28, 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 173 µg/m^3 measured by the Niland monitor on June 28, 2018.

(B) Concurrently with the Public Review period for the June 28, 2018 exceptional event, the ICAPCD is formally submitting to CARB for remittance to USEPA the Final June 28, 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

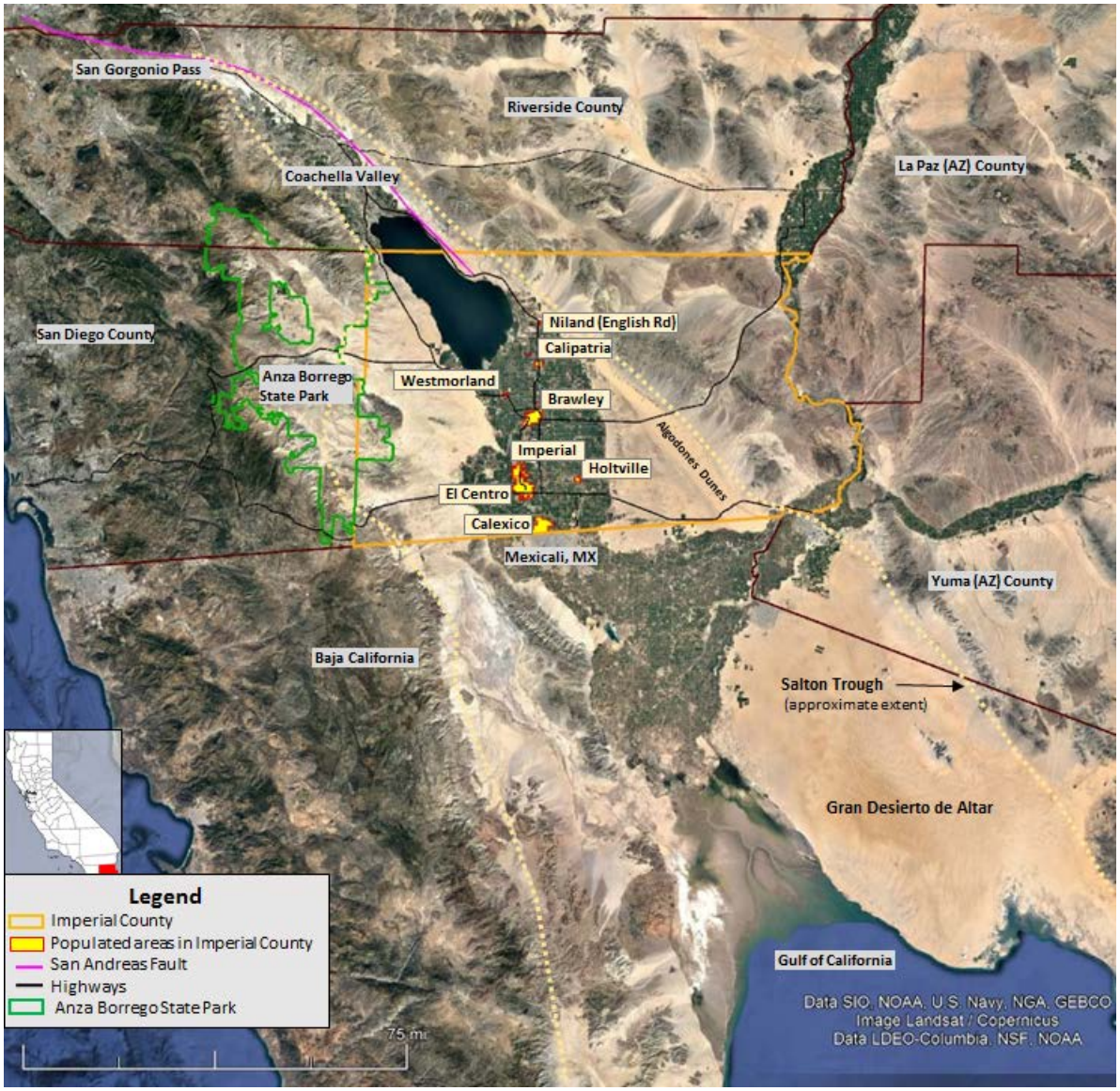


Fig 1-1: Imperial County a Southern California border region, within far southeast California bordering Arizona and Mexico has a small economically diverse region with a population of 174,528

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 Thursday, June 28, 2018 the San Diego NWS office forecast a trough of low pressure moving into the region by midweek increasing westerly winds through the San Diego county mountains and deserts.[4] By Wednesday, June 27, 2018 the Phoenix office forecast gusty conditions that would generate locally blowing dust over southeast California.[5] Neither forecast office dedicated much discussion to the weather disturbance. The most comprehensive was issued by the San Diego office on June 27, 2018:

> "…For Thursday through the weekend…a trough of low pressure will move inland through the western states. This will strengthen the onshore flow across Southern California spreading cooling inland and deepening the marine layer into the far inland valleys. For early next week…low pressure will weaken with inland warming and with the marine layer becoming a little shallower. The onshore flow will bring periods of gusty southwest to west winds in the mountains and deserts…mainly during the late afternoon through late evening each day…"[6]

No Urgent Weather Messages were issued for the San Diego County deserts and mountains or for Imperial County. **Appendix A** contains all pertinent NWS notices.

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

On June 28, 2018, the air monitors in Imperial, Riverside and Yuma counties measured elevated concentrations of particulate matter when a forecasted low-pressure system moved across southern California and brought gusty westerly winds across southeastern California. The gusty westerly winds 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**).

[4] National Weather Service, Area Forecast Discussion, June 28, 2018, San Diego office, 845pm PST
[5] National Weather Service, Area Forecast Discussion, June 27, 2018, Phoenix office, 237am MST
[6] National Weather Service, Area Forecast Discussion, June 27, 2018, San Diego office, 859am PST

FIGURE 2-1
MONITORING AND METEOROLOGICAL SITES

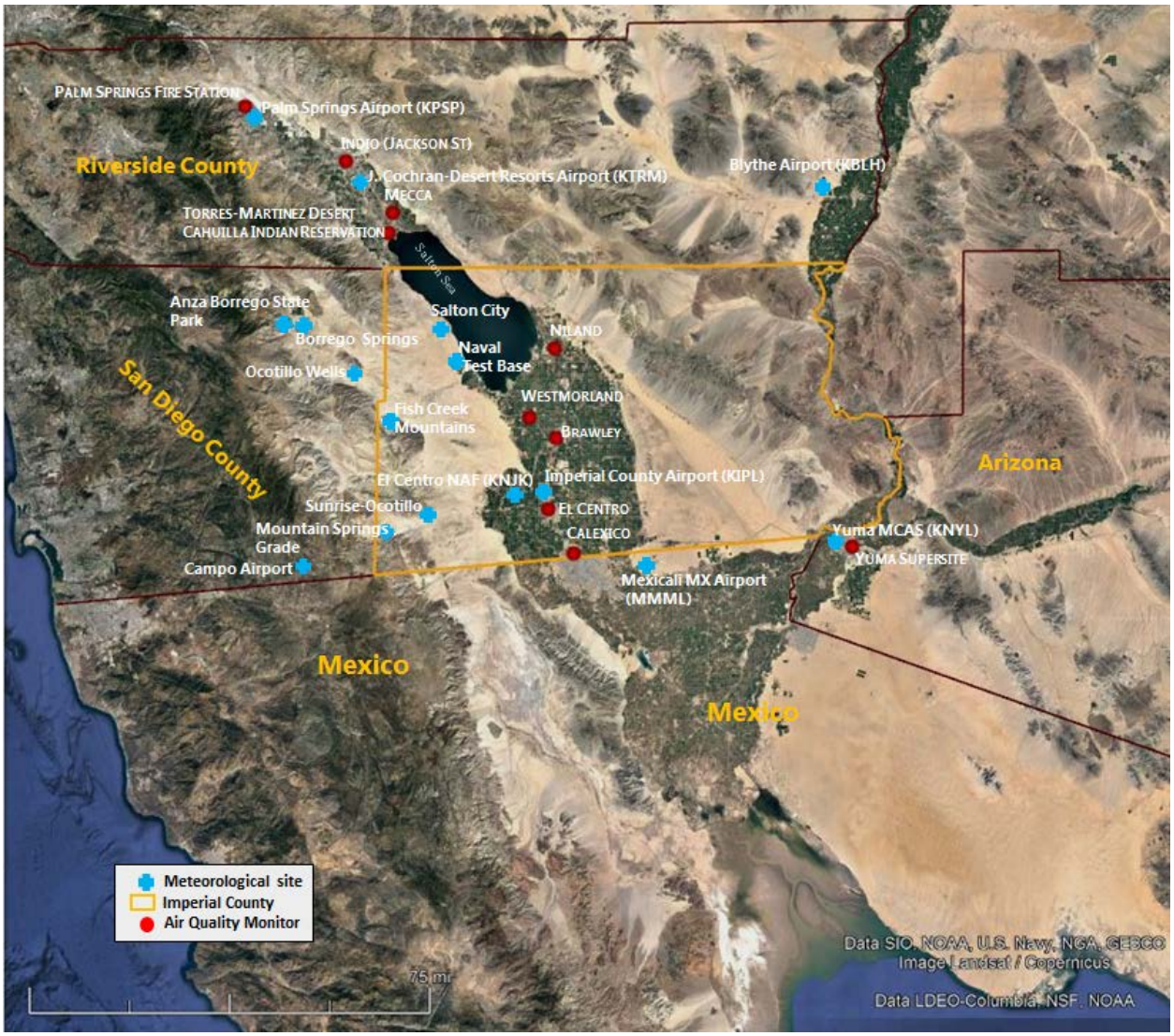


Fig 2-1: Includes a general location of the sites used in this analysis. The site furthest south is in Mexicali, Mexico and the site furthest north is the Palm Springs Fire Station

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	20180627	22	25	19	19	16	28	35	33	19	28	23	23	21	23	25	31	47	40	34	35	30	21	22	20	47	26
	20180628	19	31	20	26	18	22	39	36	23	16	20	16	14	15	12	22	30	22	48	71	85	233	32	28	**233**	37
	20180629	32	29	19	23	28	29	37	19	24	25	29	21	37	41	37	21	22	26	39	46	41	37	32	26	46	30
INDIO	20180627	AK	AK	AK	AK	AK	AK	AK	AK	AK	AK	AK	AZ	AZ	AZ	AN	AN	AN	AN	AN	AN	AN	AN	AN	AN		
	20180628	AN	AN	AN	AN	AN	AN	AN	AN	BK	BK	BK	BK	BK	BK	BK	21	53	182	314	179	109	111	77	41	**314**	120
	20180629	36	37	38	27	21	42	54	36	86	31	31	32	31	28	78	28	33	53	56	65	122	143	161	43	161	54
TORRES-MARTINEZ TRIBAL	20180627	46	65	32	42	51	236	263	89	65	78	63	50	42	35	51	79	78	69	72	306	130	69	56	49	306	88
	20180628	44	48	42	29	53	71	72	118	51	54	58	39	45	40	30	22	23	119	355	589	478	143	191	76	**589**	116
	20180629	61	51	52	49	57	228	79	29	32	35	38	44	49	40	83	44	35	41	60	106	102	83	71	54	228	63
WESTMORLAND	20180627	24	30	32	34	29	109	140	64	76	33	34	68	27	43	27	26	39	45	203	77	57	72	52	88	203	59
	20180628	102	35	33	51	37	73	110		83	90	69	59	69	57	97	147	94	249	349	83	124	63	43	61	**349**	94
	20180629	29	17	13	41	39	43	38	51	52	29	3	14	29	30	64	77	134	356	537	212	219	61	17	27	537	88
BRAWLEY	20180627	22	23	25	21	37	69	66	85	54	124	39	42	39	43	33	38	44	39	84	164	32	34	21	28	164	50
	20180628	17	26	37	17	40	64	79	78	86	61		59	53	62	40	126	187	348	460	89	58	61	48	18	**460**	91
	20180629	13	12	17	34	47	41	35	49	46	27	13	17	14	21	19	43	43	94	189	187	63	21	26	14	189	45
NILAND	20180627	57	36	29	40	54	74	107	141	170	55	55	100	64	46	48	59	59	49	59	53	99	80	67	42	170	68
	20180628	66	42	47	37	68	52	104	111		94	76	90	47	46	50	63	216	995	884	551	193	75	51	40	**995**	173
	20180629	49	79	48	57	45	107	38	37	39	61	68	48	24	35	20	32	23	39	147	115	122	50	36	90	147	58
EL CENTRO	20180627	30	24	45	78	93	79	76	66	42	49	49	58	47	40	54	64	63	82	85	55	53	34	25	17	93	54
	20180628	24	18	15	18	63	91	60	67	70	55	52	49		36	147	168	165	151	135	56	134	40	24	31	**168**	72
	20180629	18	13	84	53	38	51	65	66	55	21	14	20	25	18	19	16	24	57	48	61	37	25	21	21	84	36
CALEXICO	20180627	65	48	34	40	45	80	64	43	40	29	32	34	51	48	61	48	52	72	165	71	119	53	26	35	165	56
	20180628	68	68	84	80	73	65	89	66	50	38	52	49	50	45	158	163	75	74	61	66	36	29	19	23	**163**	65
	20180629	28	49	46	30	34	48	58	67	62	32	16	15	24	28	12	21	20	32	113	82	97	89	45	34	113	45
YUMA AZ SUPERSITE (PST)	20180627	33	19	13	61	62	40	19	28	35	25	25	13	17	23	14	35	68	67	34	25	24	27	47	48	68	33
	20180628	51	35	25	23	22	30	33	56	40	39	29	28	38	24	47	31	46	48		78	62	45	16	23	**78**	37
	20180629	25	27	25	24	28	27	34	33	29	23	20	22	20	44	42	41	40	38	59	51	69	58	17	12	69	33
YUMA AZ SUPERSITE (MST)	20180627	25	33	19	13	61	62	40	19	28	35	25	25	13	17	23	14	35	68	67	34	25	24	27	47	68	32
	20180628	48	51	35	25	23	22	30	33	56	40	39	29	28	38	24	47	31	46	48		78	62	45	16	**78**	38
	20180629	23	25	27	25	24	28	27	34	33	29	23	20	22	20	44	42	41	40	38	59	51	69	58	17	69	34

The monitor in Mecca was not included as the instrument failed to measure on June 27, 2018 through June 28, 2018. The 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

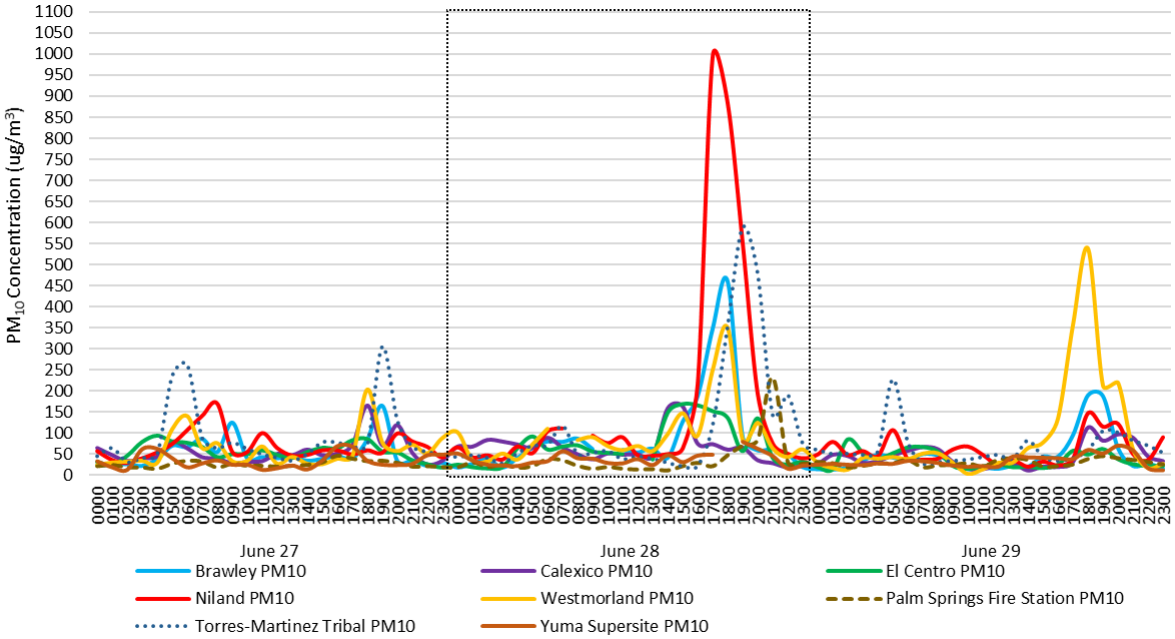


Fig 2-2: is a three-day graphical representation of the PM_{10} concentrations measured at the sites identified in **Table 2-1**. Note that measured concentrations are consistent with each other

Wind speed, wind direction and the airflow patterns combined all help explain how windblown emissions resulting from the gusty westerly winds associated with the passing of a trough affected all monitors in Imperial County on Thursday, June 28, 2018.

As mentioned above, weather forecast notices issued by San Diego and Phoenix NWS offices prior to and during the June 28, 2018 wind event only briefly discussed the impact of the winds accompanying the weather disturbance. As a result, neither NWS office issued any Urgent Weather Messages (**Appendix A**).

Figures 2-3 and 2-4 depict the compiled wind data for regional and neighboring airports and upstream sites. Airports within Imperial, Riverside, and San Diego counties measured wind gusts at or above 25 mph and the El Centro NAF (KNJK) measured several hours at or above 25 mph, coincident with measured elevated concentrations.

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

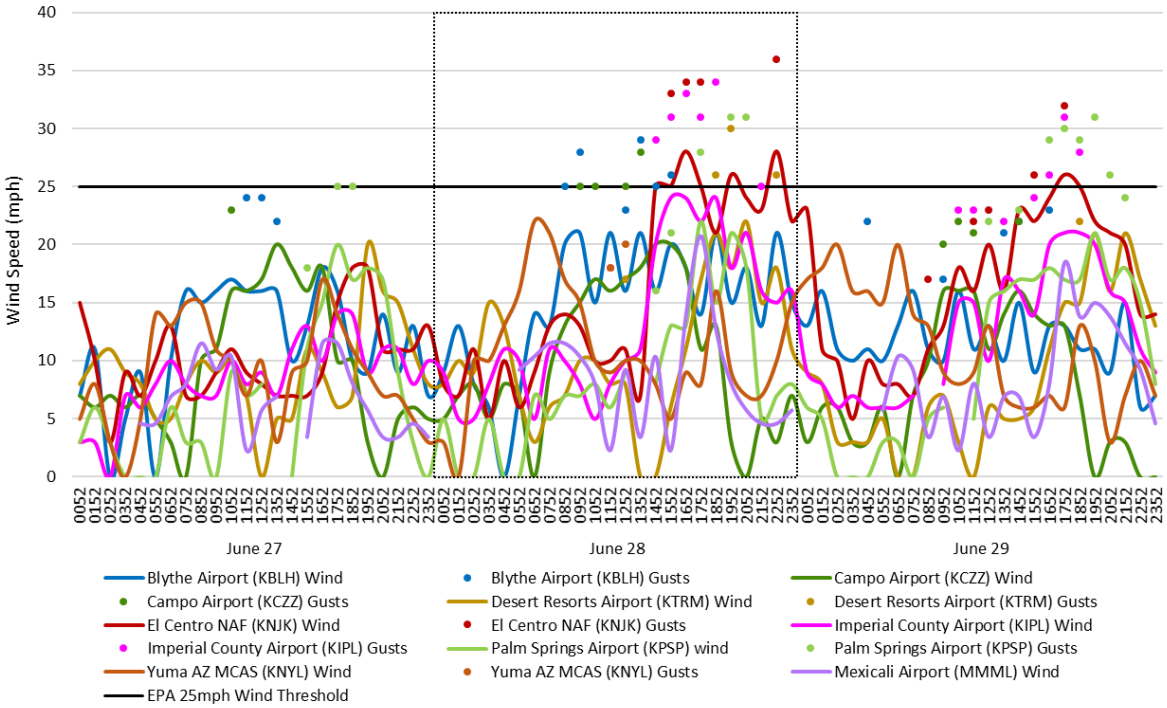


Fig 2-3: is a three-day graphical representation of the measured wind speed and wind gusts (if available) from local and neighboring airports. All data derived from the Local Climatological Data Hourly Observations (LCDHO) reports released by the NOAA https://www.ncdc.noaa.gov/. MMML is from the University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

FIGURE 2-4
WIND SPEEDS AND GUST UPSTREAM SITES

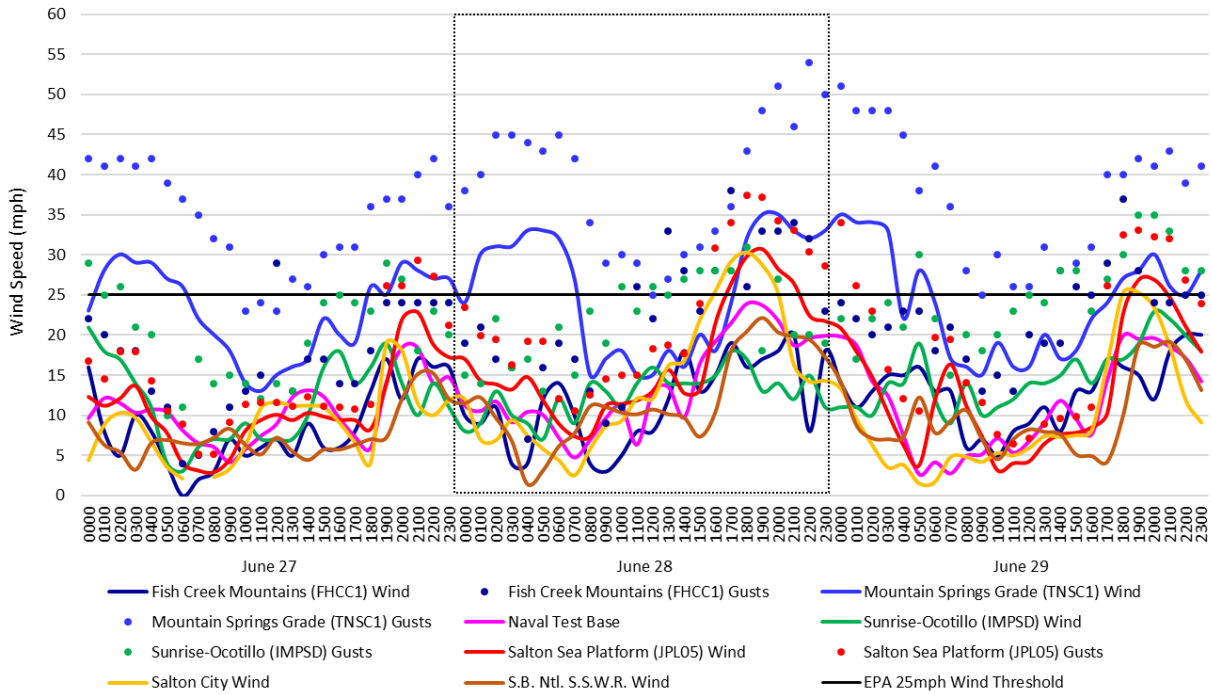


Fig 2-4: is a three-day graphical representation of the measured wind speed and wind gust (if available) from sites located upwind from the Imperial County monitors. All data derived from the University of Utah's Meso West https://mesowest.utah.edu/index.html

The National Oceanic and Atmospheric Administration (NOAA) Laboratory HYSPLIT back-trajectory models[7] provide supporting evidence of the westerly airflow within Imperial County on June 28, 2018. The HYSPLIT back-trajectory models in **Figures 2-5 and 2-6** depict the airflow during the late afternoon (1400 PST) and the evening (1700 PST) to help illustrate the westerly airflow in Imperial County.

Figure 2-5 depicts the westerly airflow with a southwest influence coincident with elevated concentrations above 100 µg/m^3 at the Calexico and El Centro monitors. The southwesterly airflow would have allowed for saltation and suspension of dust particles at elevated levels from a WSW direction. **Figure 2-6** depicts the westerly airflow with a definitive, yet not a due west influence coincident with the peak hourly measured concentration at the Niland monitor.

[7] 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 28, 2018 1400 PST

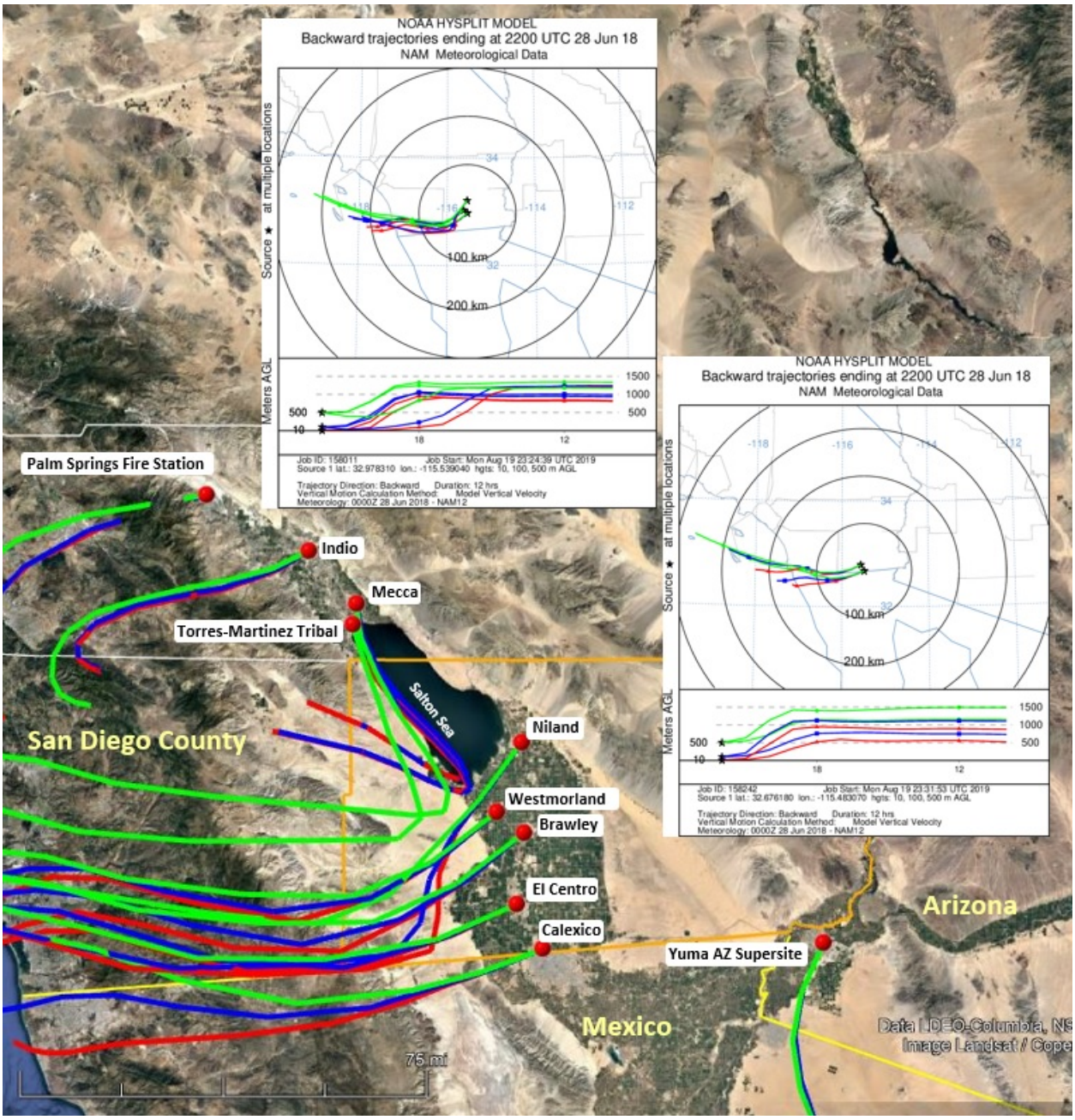


Fig 2-5: A 12-hour HYSPLIT back-trajectory ending at 1400 PST for all sites identified in **Table 2-1**. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

FIGURE 2-6
HYSPLIT MODEL All SITES JUNE 28, 2018 1700 PST

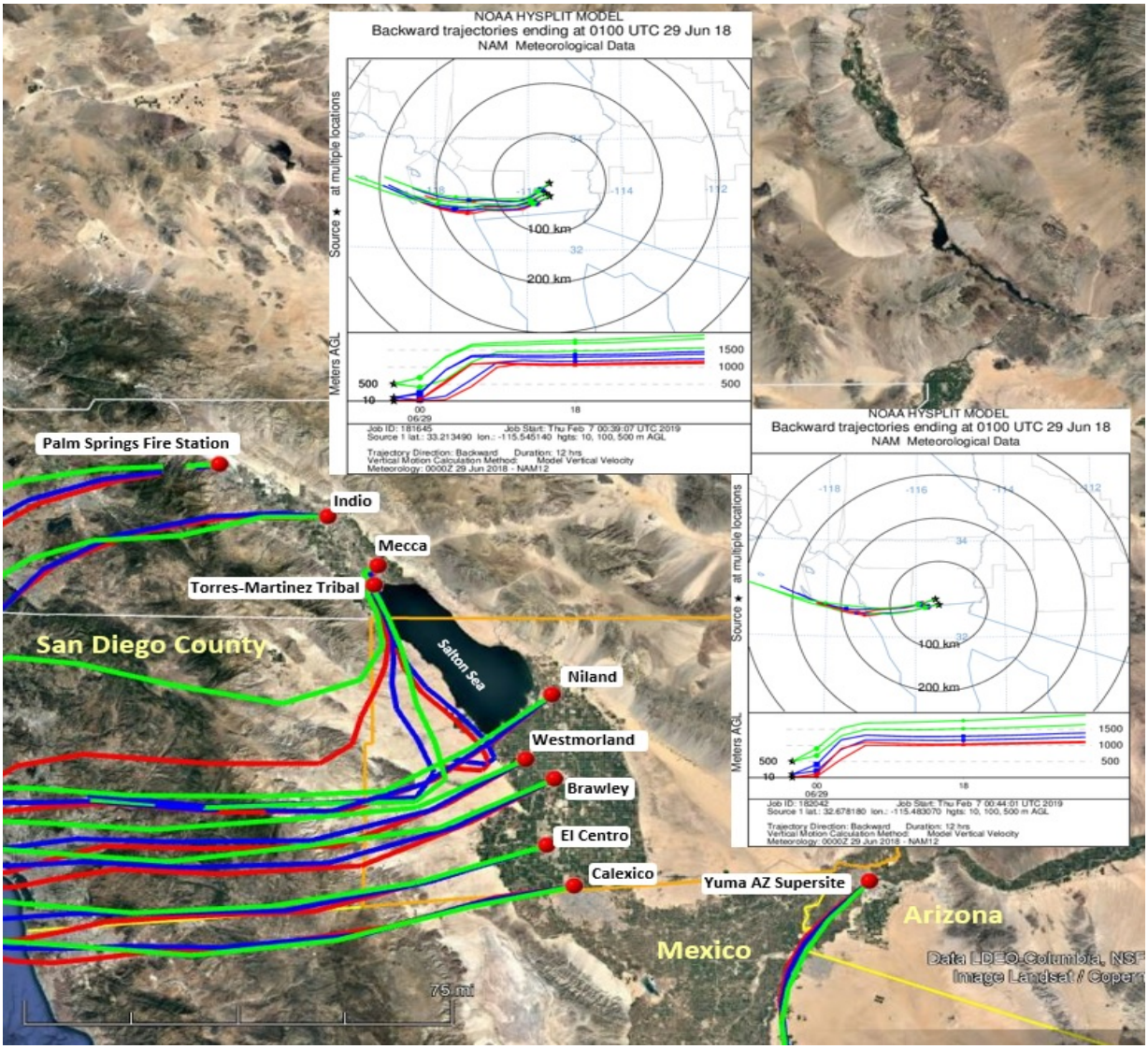


Fig 2-6: A 12-hour back-trajectory HYSPLIT ending at 1700 PST for all sites identified in **Table 2-1**. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

As strong gusty westerly winds blew over open natural mountains and desert areas west and southwest of Imperial County, fugitive windblown dust affected the air quality monitors within Imperial County. Although the NWS offices in San Diego and Phoenix did not issue Urgent Weather Messages, gusty westerly winds were measured at the El Centro NAF (KNJK) on June 28, 2018 and at upwind sites west of Imperial County.

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

As mentioned above, a low pressure moved over the region and tightened the onshore pressure gradient which caused gusty westerly winds within southeast California. Gusty westerly winds across the mountains and deserts of San Diego County were strongest during the afternoon and evening of June 28, 2018. Neither the San Diego nor Phoenix NWS office discussed the weather disturbance or its impacts in any depth and as such no Urgent Weather Messages were issued. In any event, the Phoenix NWS office forecasted or at least discussed the potential for blowing dust over southeast California days prior and during June 28, 2018.[8,9] Substantiating the transport of dust is the observations describing blowing dust within southern California by the June 28, 2018 NOAA Smoke Text Product. The observation by the NOAA Smoke Text product clearly identifies major source origins of blowing dust from the Rio Conception River Valley in northwestern Sonora, areas south of the agricultural region in northern Baja California, and the Anza-Borrego Desert south and west of the Salton Sea (**Figure 3-1**). The Smoke Text Product similarly describes the direction as "….[t]he dust closest to the Gulf of California…moving north, while further north and northeast, the dust was moving off toward the east" (**Appendix C**).[10]

While elevated wind speeds play a significant and important role in the transportation of dust, gusts play an equally significant role in deposition of particulates onto a monitor and the overall affect onto ambient air.[11] As winds and gusts increased on June 28, 2018 and transported windblown 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.

[8] National Weather Service, Area Forecast Discussion, June 27, 2018, Phoenix office, 237am MST
[9] National Weather Service, Area Forecast Discussion, June 27, 2018, Phoenix office, 953pm MST
[10] NOAA Satellite and Information Service, National Environmental Satellite, Data and information Service, 2018 Satellite Smoke Text Product, June 24, 2018, https://www.ssd.noaa.gov/PS/FIRE/DATA/SMOKE/2018/2018F290546.html
[11] 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
NOAA SMOKE TEXT PRODUCT SITES OF BLOWING DUST

Fig 3-1: An illustration of the mentioned blowing dust sites from the NOAA Smoke Text Product. Google Earth base map

Figure 3-2 below provides an illustration of some of the meteorological conditions as described above and demonstrated in the HYSPLITS, for June 28, 2018, which affected air quality in Imperial County causing an exceedance at the Niland monitor. As windblown dust emissions, generated within the natural open mountains within San Diego blew into and over natural open deserts within Imperil County air quality was affected.

FIGURE 3-2
VISUAL RAMP-UP ANALYSIS AS DISCUSSED FOR JUNE 28, 2018

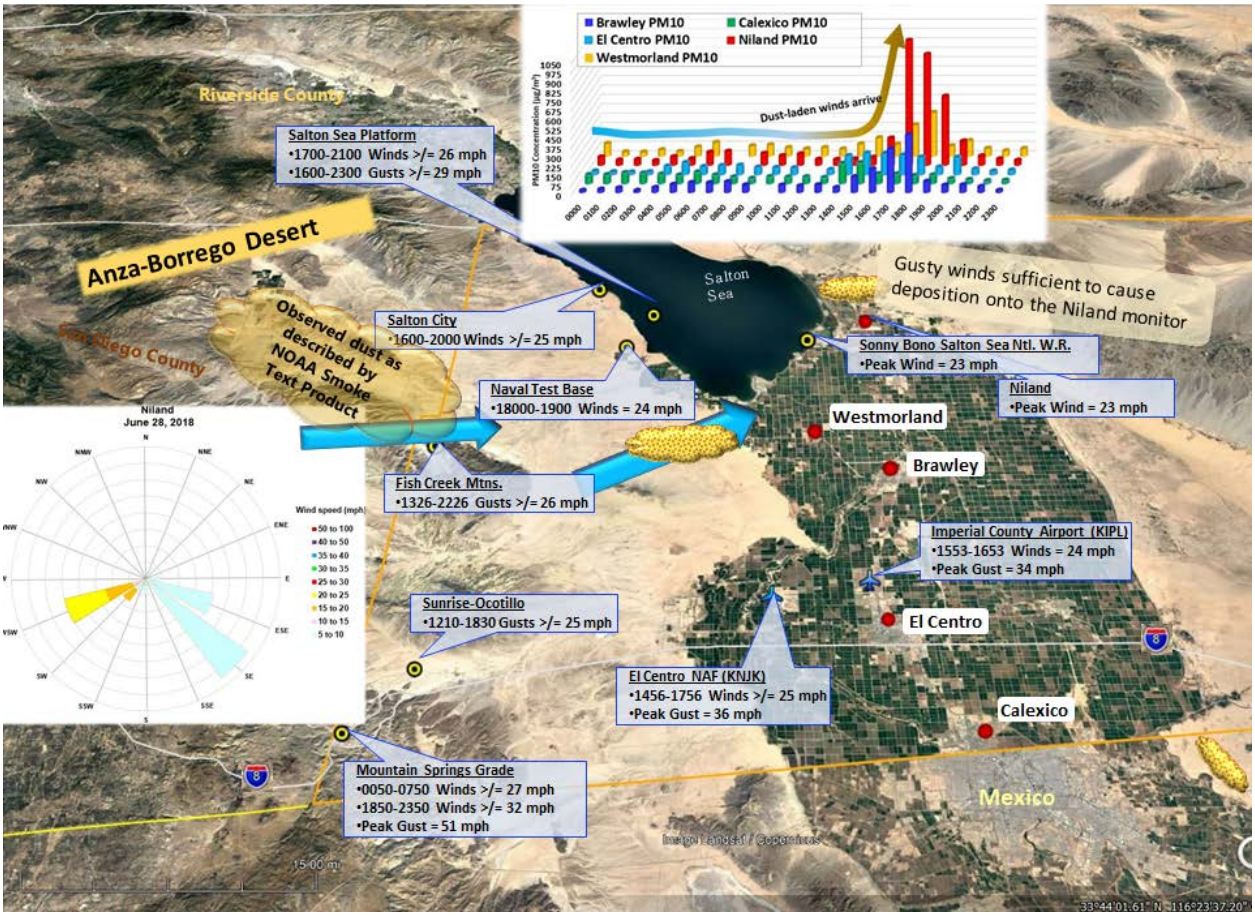


Fig 3-2: On June 28, 2018, gusty westerly winds transported dust from the natural open mountains of San Diego County into Imperial County. Gusty westerly winds were moderately higher within the northern portion of Imperial County allowing for transported dust to reach and deposit onto the Niland monitor causing an exceedance. Arrows simply for effect. Note stronger winds occurred when winds were WSW. Lighter winds were from SE an ESE. 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] The Imperial County Airport (KIPL) reported reduced visibility coincident with elevated wind speeds, wind gusts and elevated hourly concentrations of particulates at all air quality monitors. **Figure 3-3** and **Tables 3-1 and 3-2** provide information regarding the reduced visibility in Imperial County and the relation to hourly concentrations at local air monitors.

[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

While **Figure 3-3** is a graphical representation of the reduced visibility within Imperial County and surrounding areas, **Tables 3-1 and 3-2** provide a temporal relationship of wind speeds, wind direction, wind gusts (if available), and PM_{10} concentrations at the Niland 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 3-3,** visibility reduced at one of the major airports, the Imperial County Airport (KIPL) on June 28, 2018 coincident with elevated hourly concentrations at the air quality monitors in Imperial County.

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

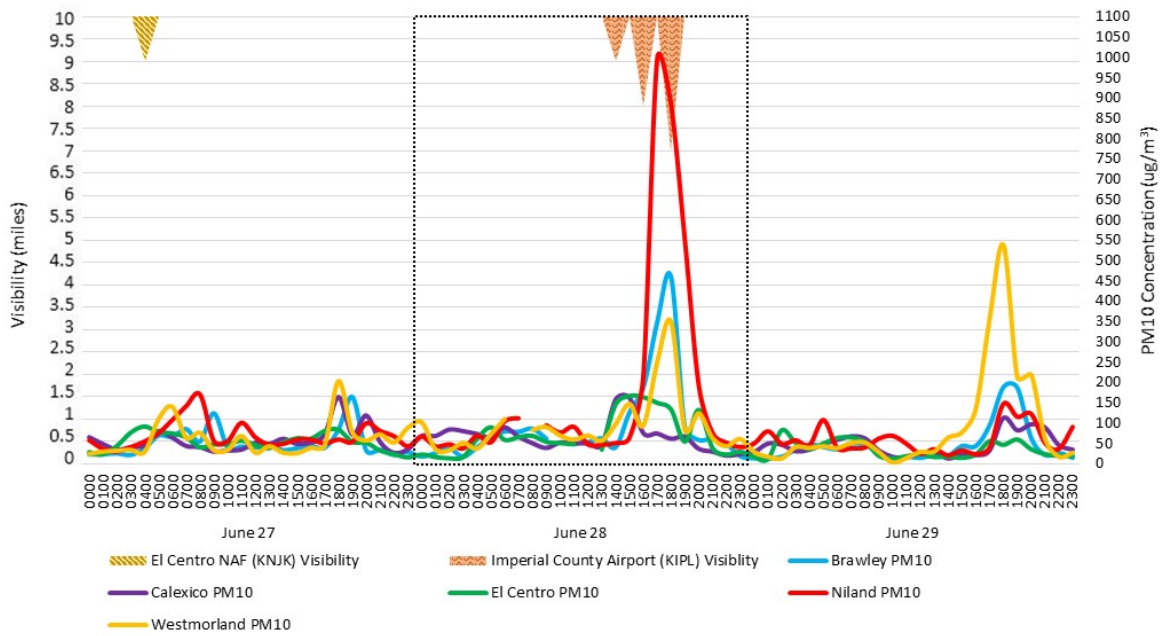


Fig 3-3: is a graphical representation of the compiled data from Imperial County Airport (KIPL) and El Centro NAF (KNJK). Reported reduced visibility is coincident with elevated winds and hourly levels of concentrations either just prior to peak concentrations or after. Visibility data from the NCEI's 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[13] the **Tables 3-1 and 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.

[13] "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 28, 2018

	SUNRISE-OCOTILLO (IMPSD)			FISH CREEK MOUNTAINS (FHCC1)			SALTON CITY		NAVAL TEST BASE		SALTON SEA PLATFORM (JPL05)			SONNY BONO SALTON SEA NATIONAL WILDLIFE REFUGE		NILAND		
HR	**W/S**	**W/G**	**W/D**	**W/S**	**W/G**	**W/D**	**W/S**	**W/D**	**W/S**	**W/D**	**W/S**	**W/G**	**W/D**	**W/S**	**W/D**	**W/S**	**W/D**	**PM_{10}**
0000	8	15	WSW	10	19	SSW	12	WSW	11	W	17	23	W	12	W	6	E	66
0100	9	14	WSW	9	21	SSW	7	W	11	W	14	20	WNW	12	W	5	ESE	42
0200	13	22	WSW	11	17	SSW	7	WSW	12	WNW	14	19	W	10	W	6	ESE	47
0300	10	16	WSW	4	16	SW	9	WSW	9	WNW	13	16	W	7	NW	5	ESE	37
0400	9	17	WSW	4	7	SSW	8	W	10	WNW	15	19	W	1	SW	6	ESE	68
0500	7	13	WSW	12	16	SSW	6	NW	10	NW	12	19	WNW	3	SE	8	ESE	52
0600	12	21	**WSW**	14	19	**SSW**	4	**WNW**	7	**NW**	9	12	**WNW**	6	**SSE**	8	**SE**	104
0700	9	15	**WSW**	10	17	**SSW**	3	**NNW**	5	**N**	7	11	**NW**	8	**S**	10	**SE**	111
0800	14	23	WSW	4	13	SSW	6	N	7	SE	7	13	SW	11	SSE	10	SE	
0900	13	19	WSW	3	9	ESE	9	ESE	10	ESE	11	15	ESE	11	SE	8	SE	94
1000	11	26	WSW	5	11	NNE	9	E	11	E	11	15	E	10	SE	8	SE	76
1100	14	23	WSW	8	26	W	12	ENE	6	ESE	12	15	ENE	10	SE	8	SE	90
1200	16	26	WSW	8	22	W	12	E	13	ESE	13	18	E	11	SE	8	SE	47
1300	14	25	WSW	12	33	W	16	ESE	14	E	16	19	ESE	10	SE	8	SE	46
1400	14	27	WSW	18	28	WSW	17	SE	10	WNW	13	18	ESE	10	SE	7	SE	50
1500	14	28	WSW	13	23	WSW	22	WSW	16	WSW	13	24	S	7	SE	6	SW	63
1600	15	28	**W**	15	28	**W**	26	**WSW**	19	**W**	21	31	**WSW**	10	**W**	16	**WSW**	216
1700	18	28	**W**	19	38	**W**	29	**WSW**	22	**W**	26	34	**WSW**	18	**W**	22	**WSW**	995
1800	17	31	**W**	16	26	**WSW**	30	**WSW**	24	**WSW**	30	37	**WSW**	20	**W**	23	**WSW**	884
1900	13	18	**W**	17	33	**WSW**	29	**WSW**	24	**WSW**	31	37	**WSW**	22	**WSW**	20	**SW**	551
2000	14	27	**WNW**	18	33	**WSW**	25	**WSW**	22	**WSW**	28	34	**WSW**	20	**WSW**	21	**WSW**	193
2100	12	20	WNW	20	34	WSW	16	WSW	19	W	26	33	WSW	20	WSW	18	WSW	75
2200	15	20	NW	8	32	WSW	14	WSW	20	WSW	22	30	WSW	19	WSW	13	WSW	51
2300	11	19	WNW	18	23	SSW	14	WSW	20	W	22	29	WSW	17	WSW	2	S	40

Wind data for Sunrise Ocotillo (IMPSD), Fish Creek Mountains (FHCC1) and the Salton Sea Platform (JPL05) from the University of Utah's MesoWest system https://mesowest.utah.edu/index.html. Wind data for Salton City, and Naval Test Base from AQMIS2. Wind data for El Centro NAF (KNJK) and Imperial County Airport (KIPL) from the NCEI's QCLCD data bank https://www.ncdc.noaa.gov/. Air quality data for Niland from the EPA's AQS repository. Wind speeds = mph; Direction = degrees. Due to the different times that wind data and air quality data is sampled at various sites, the hour given represents the hour in which the measurement was taken

TABLE 3-2
WIND SPEED AND PM_{10} CONCENTRATIONS JUNE 28, 2018

	EL CENTRO NAF (KNJK)			SUNRISE-OCOTILLO (IMPSD)			SALTON CITY		SALTON SEA PLATFORM (JPL05)			WSTMLD	BRWLY	NLND	EC	CX
HR	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/D	W/S	W/G	W/D	PM_{10} (ug/m^3)				
0000	8		WNW	8	15	WSW	12	WSW	17	23	W	102	17	66	24	68
0100	7		W	9	14	WSW	7	W	14	20	WNW	35	26	42	18	68
0200	11		W	13	22	WSW	7	WSW	14	19	W	33	37	47	15	84
0300	5		W	10	16	WSW	9	WSW	13	16	W	51	17	37	18	80
0400	10		SSE	9	17	WSW	8	W	15	19	W	37	40	68	63	73
0500	6		S	7	13	WSW	6	NW	12	19	WNW	73	64	52	91	65
0600	9		SSE	12	21	WSW	4	WNW	9	12	WNW	110	79	104	60	89
0700	13		SSE	9	15	WSW	3	NNW	7	11	NW		78	111	67	66
0800	14		SE	14	23	WSW	6	N	7	13	SW	83	86		70	50
0900	13		SE	13	19	WSW	9	ESE	11	15	ESE	90	61	94	55	38
1000	10		SE	11	26	WSW	9	E	11	15	E	69		76	52	52
1100	10		ESE	14	23	WSW	12	ENE	12	15	ENE	59	59	90	49	49
1200	11		SE	16	26	WSW	12	E	13	18	E	69	53	47		50
1300	7		SW	14	25	WSW	16	ESE	16	19	ESE	57	62	46	36	45
1400	25		WSW	14	27	WSW	17	SE	13	18	ESE	97	40	50	147	158
1500	25	33	WSW	14	28	WSW	22	WSW	13	24	S	147	126	63	168	163
1600	28	34	WSW	15	28	W	26	WSW	21	31	WSW	94	187	216	165	75
1700	25	34	WSW	18	28	W	29	WSW	26	34	WSW	249	348	995	151	74
1800	21		WSW	17	31	W	30	WSW	30	37	WSW	349	460	884	135	61
1900	26		WSW	13	18	W	29	WSW	31	37	WSW	83	89	551	56	66
2000	24		WSW	14	27	WNW	25	WSW	28	34	WSW	124	58	193	134	36
2100	23		W	12	20	WNW	16	WSW	26	33	WSW	63	61	75	40	29
2200	28	36	W	15	20	NW	14	WSW	22	30	WSW	43	48	51	24	19
2300	22		W	11	19	WNW	14	WSW	22	29	WSW	61	18	40	31	23

Wind data for Sunrise Ocotillo (IMPSD) and the Salton Sea Platform (JPL05) from the University of Utah's MesoWest system https://mesowest.utah.edu/index.html. Wind data for Salton City from AQMIS2. Wind data for El Centro NAF (KNJK) from the NCEI's QCLCD data bank https://www.ncdc.noaa.gov/. Air quality data for Niland from the EPA's AQS repository. Wind speeds = mph; Direction = degrees. Due to the different times that wind data and air quality data is sampled at various sites, the hour given represents the hour in which the measurement was taken

As mentioned above, although Area Forecast Discussions discussed the likelihood of blowing dust from the gusty westerly winds it was the NOAA Smoke Text Product that identified major sources of blowing dust affecting southern California, including Imperial County. As the system moved over the area, strong gusty westerly winds affected the regional air monitors in Imperial County on June 28, 2018 (**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.[14] As transported windblown dust entered Imperial County on June 28, 2018 air quality degraded in Imperial County. Overall, the

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

gusty westerly winds associated with the low-pressure system affected air quality in Imperial County.

FIGURE 3-4
IMPERIAL VALLEY AIR QUALITY INDEX FOR NILAND
JUNE 28, 2018

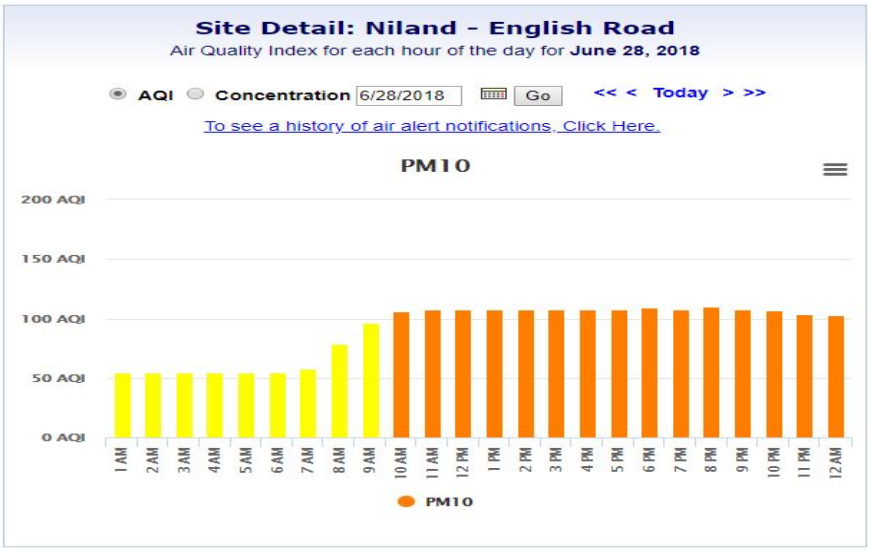


Fig 3-4: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Yellow" or Moderate level to an "Orange" level or a level that is Unhealthy for sensitive groups

III.1 Summary of Forecasts and Warnings

Neither the San Diego nor Phoenix NWS offices accurately forecasted the strength of the low-pressure system that moved through southern California on Thursday, June 28, 2018. As a consequence, neither NWS office issued Urgent Weather Messages.[15,16] Phoenix, however, did mention the possibility of blowing dust resulting from the gusty westerly winds within southeast California.[17] **Appendix A** contains all pertinent NWS notices.

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 28, 2018 different sites measured wind speeds at or above 25 mph.

[15] National Weather Service, Zone Forecast, June 28, 2018, San Diego office, 201pm PST
[16] National Weather Service, Zone Forecast, June 28, 2018, Phoenix office, 146pm MST
[17] National Weather Service, Zone Forecast, June 27, 2018, Phoenix office, 237am MST

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 and 4-2 show the time series of available FRM and BAM 24-hr PM_{10} concentrations at the Niland air quality monitor for the period of January 1, 2010 through June 28, 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).[18] 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 28, 2018, as measured by the Niland monitor, were used to establish the historical and seasonal variability over time.[19] All figures illustrate that the exceedance, which occurred on June 28, 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.

[18] 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.

[19] FRM sampling ended December 2016.

FIGURE 4-1
NILAND HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO JUNE 28, 2018

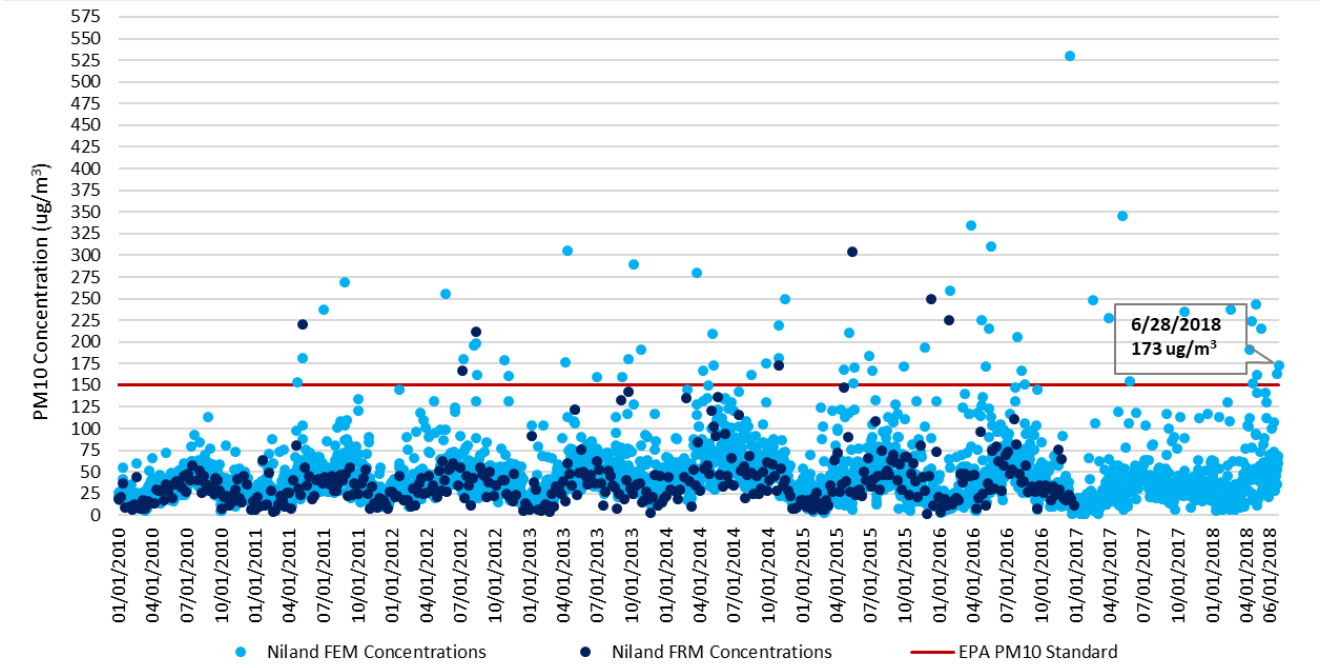
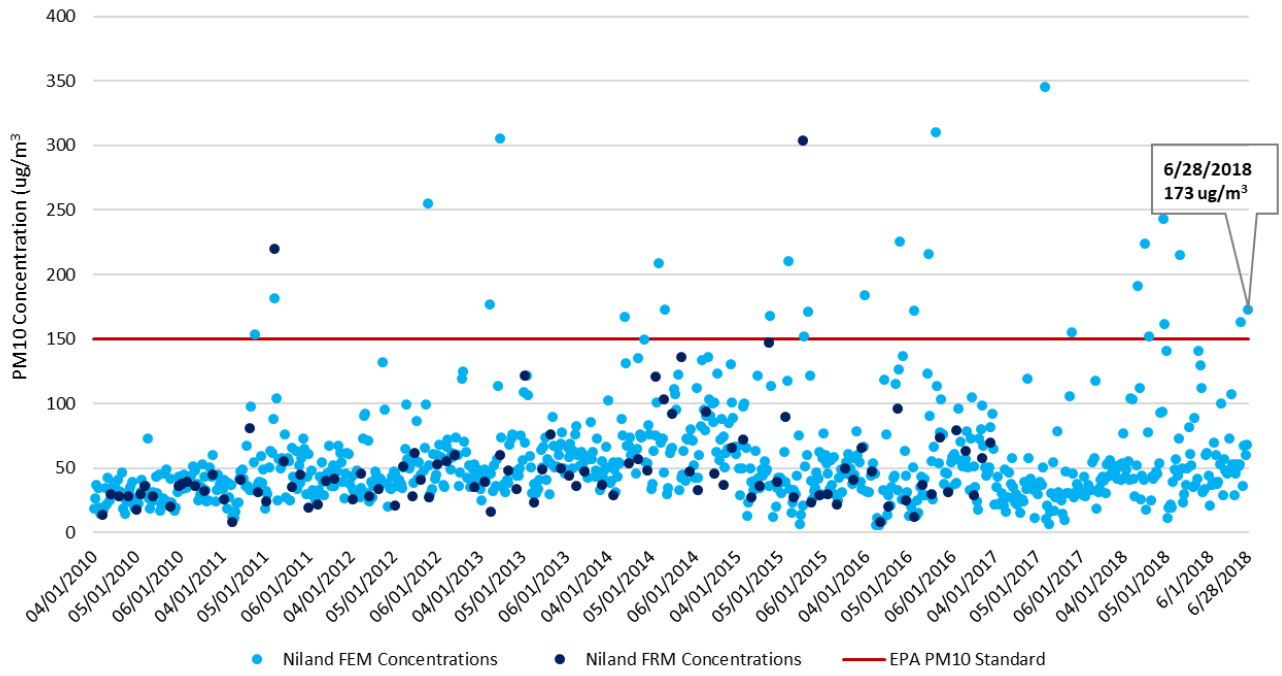


Fig 4-1: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 173 µg/m^3 on June 28, 2018 by the Niland monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-1,** for Niland includes 3,101 sampling days (January 1, 2010 through June 28, 2018). During the January 1, 2010 through June 28, 2018 period, the Niland monitor measured 58 exceedance days out of 3,101 sampling days, which translates into an occurrence rate less than 2%. Historically, there were six (6) exceedance days measured during the first quarter; twenty-five (25) exceedance days measured during the second quarter; fifteen (15) exceedance days measured during the third quarter; and twelve (12) exceedance days measured during the fourth quarter.

FIGURE 4-2
NILAND SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***APRIL 1, 2010 TO JUNE 28, 2018**



***Quarterly: April 1, 2010 to June 30, 2017 and April 1, 2018 to June 28, 2018**
Fig 4-2: A comparison of PM_{10} seasonal concentrations demonstrate that the measured concentration of 173 µg/m^3 by the Niland monitor on June 28, 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 817 sampling days, 917 credible samples and twenty-five (25) exceedance days. This translates to less than a 2.7% seasonal exceedance occurrence rate.

Examining the historical and seasonal time series concentrations as they relate to the June 28, 2018 measured exceedances, the exceedances measured on June 28, 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 deserts of the San Diego County Mountains. The origination of these emissions from these areas affected all the air quality monitors on June 28, 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

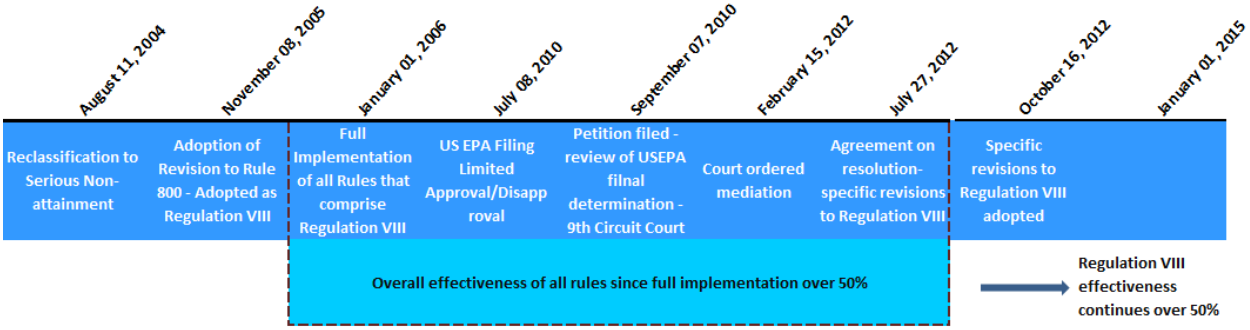


Fig 5-1: Regulation VIII Graphic Timeline

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 28, 2018 different sites measured wind speeds at or above 25 mph. Wind speeds of 25 mph are normally sufficient to overcome most PM_{10} control measures. During the June 28, 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 Niland monitor during the June 28, 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 Partial Burn Day, related to agricultural burning, waste burning or dust.

FIGURE 5-2
PERMITTED SOURCES

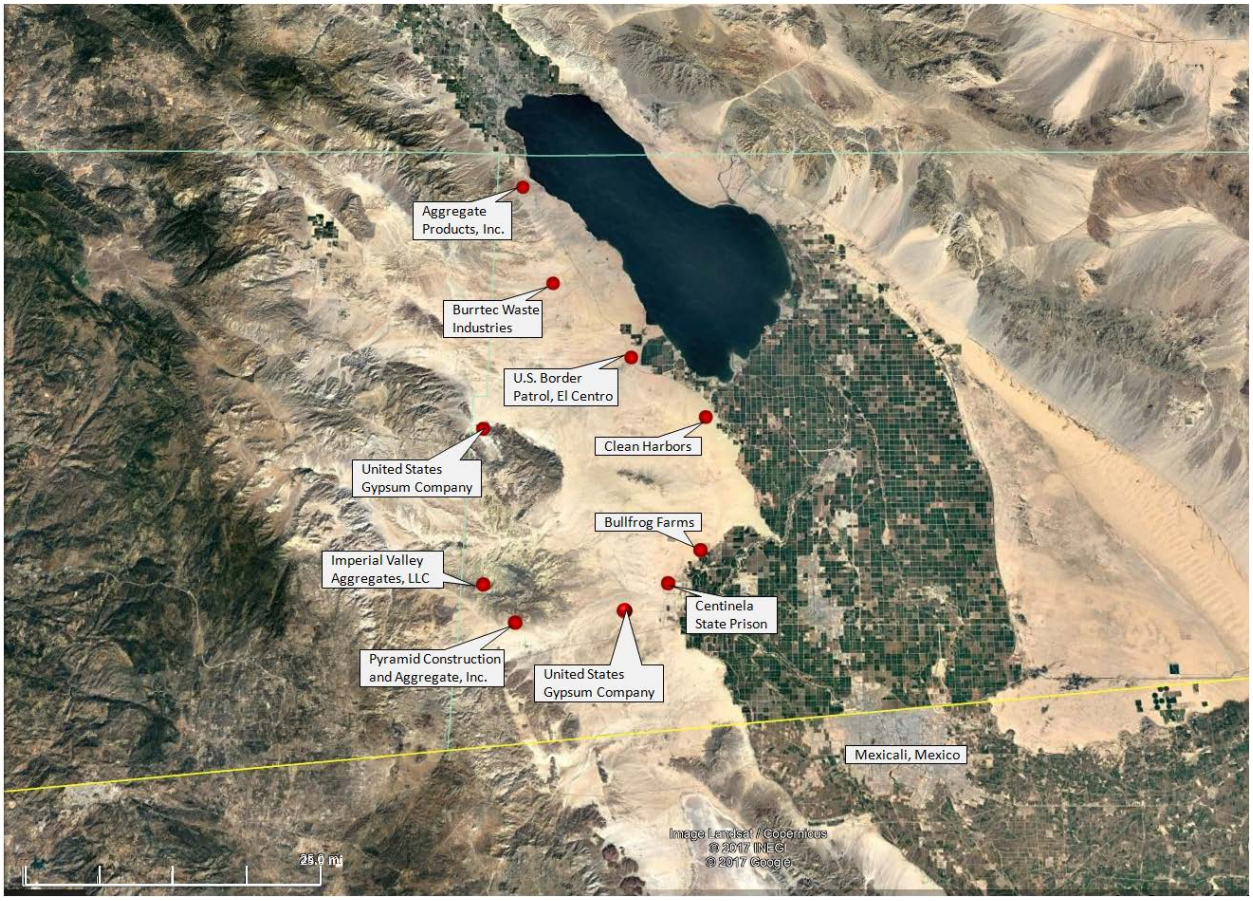


Fig 5-2: The above map identifies those permitted sources located west, northwest and southwest of the Niland monitor. The green line to the north denotes the political division between Imperial and Riverside counties. The yellow line below denotes the international border between the United States and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

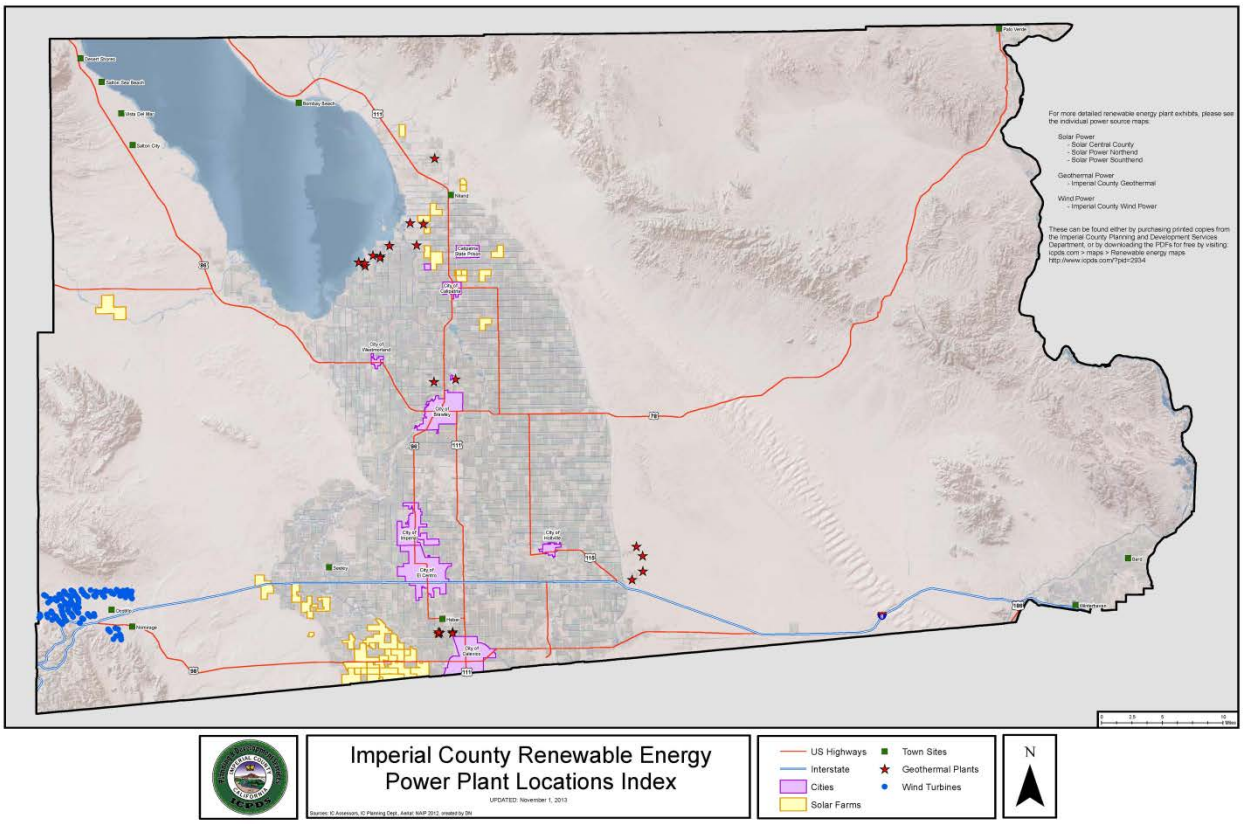


Fig 5-3: The above map identifies those power sources located west, northwest and southwest of the Niland monitor. Blue indicate the Wind Turbines, Yellow are the solar farms and stars are geothermal plants

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 unexpected, Pacific weather disturbances during certain times of year will bring westerly winds into the region. The low-pressure system that moved inland over southern California produced gusty westerly winds across much of southern California but in particular within the San Diego County mountains and deserts. Strong gusty westerly winds blew over and through the San Diego Mountains generating and transporting dust emissions down slopes onto the open natural desert floor west of Imperial County.

As discussed in the Clear Causal section, the NOAA Smoke Text Product identified major sources of blowing dust in southern California as originating from northern Baja California and the Anza Borrego desert as well as from a source area deeper south in Sonora Mexico. In addition, the dust plumes along northern Baja California and Anza Borrego were described as blowing east. Although both the Westmorland and Brawley monitors measured elevated concentrations of particulates, monitors further north, closest to the Anza Borrego area measured higher concentrations of particulates. Because the gusty westerly winds were strongest along the northwestern portion of Imperial County and the southwestern portion of Riverside County generated and transported dust from San Diego County affected the Indio, Torres Martinez and Niland monitors significantly. Unlike the Westmorland and Brawley monitors, the Niland monitor was in the direct path of the blowing dust, observed by the NOAA Smoke Text Product, to the east of Anza Borrego allowing for sufficient deposition of dust particles onto the Niland monitor causing an exceedance.

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 28, 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 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. The PM_{10} exceedance measured at the Niland monitor was caused by naturally occurring strong gusty westerly winds that transported windblown dust into Imperial County from areas located within the Sonoran Desert regions to the west of Imperial County. These facts provide strong evidence that the PM_{10} exceedance at the Niland monitor on June 28, 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 Niland monitor on June 28, 2018, was caused by the transport of windblown dust into Imperial County by strong 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. 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 Niland monitor in Imperial County demonstrates a consistency of elevated gusty westerly winds with elevated concentrations of PM_{10} on June 28, 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 28, 2018.

VI.5 Concentration to Concentration Analysis

The historical annual and seasonal 24-hr average PM_{10} measured concentrations at the Niland 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 gusty westerly winds that preceded the identified passing of a trough 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 Niland monitor in Imperial County on June 28, 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.[20]

[20] 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.