IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

[Insert Image]

SEPTEMBER 21, 2017
Exceptional Event Documentation
For the Imperial County PM_{10} Nonattainment Area

An exceedance of the National Ambient Air Quality Standard (NAAQS) for PM_{10} at the Calexico monitor in Calexico, California on September 21, 2017

TABLE OF CONTENTS

SECTION PAGE

LIST OF FIGURES

FIGURE PAGE

LIST OF TABLES

TABLE **PAGE**

ACRONYM	DESCRIPTIONS
AOD	Aerosol Optical Depth
AQI	Air Quality Index
AQS	Air Quality System
BACM	Best Available Control Measures
BAM 1020	Beta Attenuation Monitor Model 1020
BLM	United States Bureau of Land Management
BP	United States Border Patrol
CAA	Clean Air Act
CARB	California Air Resources Board
CMP	Conservation Management Practice
DCP	Dust Control Plan
DPR	California Department of Parks and Recreation
EER	Exceptional Events Rule
EPA	Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
GOES-W/E	Geostationary Operational Environmental Satellite (West/East)
HC	Historical Concentrations
HYSPLIT	Hybrid Single Particle Lagrangian Integrated Trajectory Model
ICAPCD	Imperial County Air Pollution Control District
INPEE	Initial Notification of a Potential Exceptional Event
ITCZ	Inter Tropical Convergence Zone
KBLH	Blythe Airport
KCZZ	Campo Airport
KIPL	Imperial County Airport
KNJK	El Centro Naval Air Station
KNYL/MCAS	Yuma Marine Corps Air Station
KPSP	Palm Springs International Airport
KTRM	Jacqueline Cochran Regional Airport (aka Desert Resorts Rgnl Airport)
PST	Local Standard Time
MMML/MXL	Mexicali, Mexico Airport
MODIS	Moderate Resolution Imaging Spectroradiometer
MPH	Miles Per Hour
MST	Mountain Standard Time
NAAQS	National Ambient Air Quality Standard
NCAR	National Center for Atmospheric Research
NCEI	National Centers for Environmental Information
NEAP	Natural Events Action Plan
NEXRAD	Next-Generation Radar

NOAA	National Oceanic and Atmospheric Administration
nRCP	Not Reasonably Controllable or Preventable
NWS	National Weather Service
PDT	Pacific Daylight Time
PM_{10}	Particulate Matter less than 10 microns
$PM_{2.5}$	Particulate Matter less than 2.5 microns
PST	Pacific Standard Time
QA/QC	Quality Assured and Quality Controlled
QCLCD	Quality Controlled Local Climatology Data
RACM	Reasonable Available Control Measure
RAWS	Remote Automated Weather Station
SIP	State Implementation Plan
SLAMS	State Local Ambient Air Monitoring Station
SMP	Smoke Management Plan
SSI	Size-Selective Inlet
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UTC	Coordinated Universal Time
WRCC	Western Regional Climate Center

I Introduction

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

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

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

TABLE 1-1 TITLE 40 CFR §50.14(c)(3)(iv) CHECKLIST EXCEPTIONAL EVENT DEMONSTRATION FOR HIGH WIND DUST EVENT (PM_{10})		DOCUMENT SECTION
1	A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s)	Pg 9
2	A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation	Pg 18
3	Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times to support the requirement at paragraph (c)(3)(iv)(B) of this section	Pg 28
4	A demonstration that the event was both not reasonably controllable and not reasonably preventable	Pg 31
5	A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event	Pg 36

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

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

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

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

As such, this report demonstrates that a naturally occurring event caused an exceedance observed on September 21, 2017, which elevated particulate matter within San Diego, Riverside and Imperial counties and affected air quality. The analyses contained in this report includes regulatory and non-regulatory data that provides support for the elements listed in **Table 1-1** and **Table 1-2**. This demonstration substantiates that this

event meets the definition of the US EPA Regulation for the Treatment of Data Influenced by Exceptional Events (EER)[2].

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

The ICAPCD utilizes a web-based public notification process to alert the public of forecasted weather conditions and potential changes in ambient air concentrations that may affect the public. The ICAPCD identifies these public notifications as Advisory Events. Unfortunately, as of the writing of this documentation, due to ransomware, random archival files were deleted in order to protect the integrity of the network system. Web notice files prior to September 21, 2017 were deleted and are no longer available. However, the September 21, 2017 notified the public of the issued wind advisory by both National Weather Service offices in San Diego and Phoenix. The public was advised that sustained westerly winds above 25 mph and gusts above 40 mph would affect Imperial County, specifically affecting areas within the western portion of Imperial County.

The notice identified a strong cool seasonal front passing through the region through the evening hours of September 21, 2017. If available, **Appendix C** contains copies of notices pertinent to the September 21, 2017 event.

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

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

On September 21, 2017, a naturally occurring event elevated particulate matter within San Diego, Riverside and Imperial Counties, causing an exceedance at the Niland monitor (06-025-4004). Subsequently, the ICAPCD made a formal written request to the California Air Resources Board (CARB) to place preliminary flags on SLAMS measured PM_{10} hourly concentrations from the Calexico monitor on September 21, 2017. After review, CARB submitted the INPEE, for the September 21, 2017 event in July of 2017. The submitted request included a brief description of the meteorological conditions for September 21, 2017 indicating that a potential natural event occurred. The ICAPCD has engaged in discussions with US EPA Region IX regarding the demonstration prior to formal submittal.

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

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

(A) The CARB and USEPA have reviewed and commented on the draft version of the September 21, 2017 exceptional event prepared by the ICAPCD. After addressing all substantive and non-substantive comments by both CARB and USEPA the ICAPCD has published a notice of availability in the Imperial Valley Press announcing a 30-day public review process. The published notice invites comments by the public regarding the request, by the ICAPCD, to exclude the measured concentration of 273 $\mu g/m^3$ measured by the Calexico monitor on September 21, 2017.

(B) Concurrently with the Public Review period for the September 21 2017 exceptional event, the ICAPCD is formally submitting to CARB for remittance to USEPA the Draft September 21, 2017 exceptional event.

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

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

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

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

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

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

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

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

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

FIGURE 1-1
IMPERIAL COUNTY

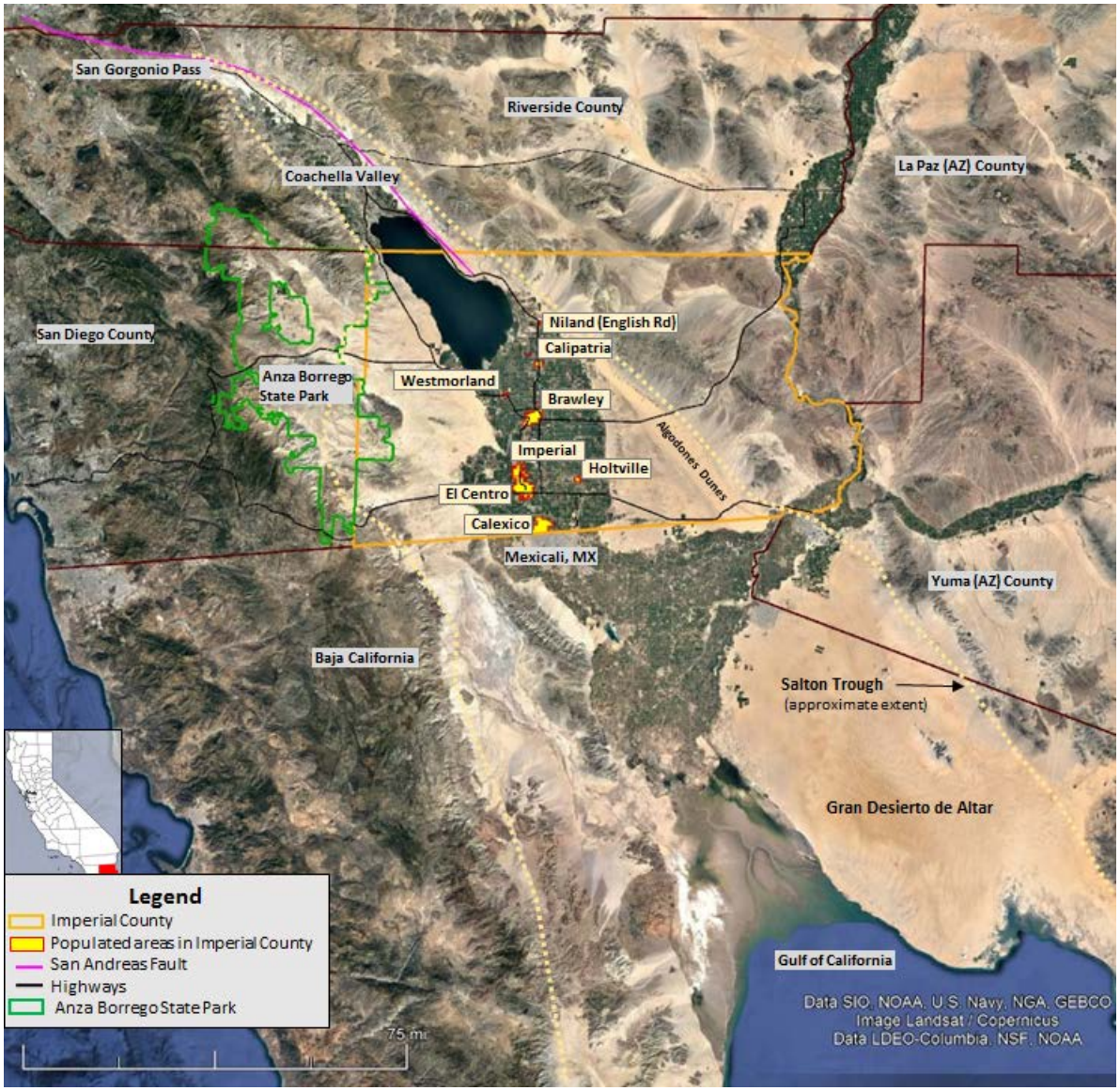


Fig 1-1: Imperial County a Southern California border region, within far southeast California bordering Arizona and Mexico has a small economically diverse region with a population of 174,528

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

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

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

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

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

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

FIGURE 1-2
MONITORING SITES IN AND AROUND IMPERIAL COUNTY

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

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

II.1 Description of the event causing the exceedance

Days before and during Thursday, September 21, 2017, the National Weather Service (NWS) offices in Phoenix and San Diego issued Area Forecast Discussions describing an "unseasonably deep trough" that moved out of Washington down the West Coast Wednesday, September 20, 2017 and Thursday, September 21, 2017.[4] Because winds were expected to increase significantly within the San Diego County Mountains and deserts Thursday, September 21, 2017 afternoon through the evening, the San Diego NWS office issued the first Urgent Weather Message September 20, 2017.[5] A total of nine (9) Urgent Weather Messages were issued by either the San Diego or Phoenix NWS office advising of advisory level wind within the San Diego County Mountains and deserts and Imperial County.[6]

The event was best described by the Phoenix office in its Area Forecast Discussion when it described the "… first vestiges of height falls and cold advection aloft…" as "impinging on SE California" during the early morning hours of September 21, 2017. However, the Phoenix NWS office was quick to explain that the "…more pronounced impacts…" would be "…experienced late…" in the afternoon and evening. As a result the Phoenix NWS office included additional areas within Imperial County specifically Interstate 8 from El Centro westward.[7] **Appendix A** contains all pertinent NWS notices.

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

On September 21, 2017, the air monitors in Imperial, Riverside and Yuma counties measured elevated concentrations of particulate matter when a forecasted low-pressure system and associated cold front brought strong gusty westerly winds across southeastern California and portions of Arizona and Nevada. The system was largely devoid of moisture and as a result strong gusty westerly winds ahead of the cold front generated emissions from within the open mountain ranges and surrounding open natural deserts within northwestern Mexico, San Diego County and Imperial County. These windblown emissions were transported to the Calexico monitor causing an

[4] National Weather Service, Area Forecast Discussion, Sep., 20, 2017, San Diego office, 218am PDT
[5] National Weather Service, Area Forecast Discussions, Sep., 19, 2017 to Sep., 20, 2017, San Diego and Phoenix NWS offices, 931am PDT; 223pm MST; 218am MST; 218am PDT and 938am PDT
[6] National Weather Service, Urgent Weather Messages, Sep., 20, 2017 to Sep., 22, 2017, San Diego and Phoenix NWS offices, 141pm PDT; 131pm MST; 205am MST; 222am PDT; 1128am PDT; 303pm MST; 1258am PDT and 519am MST
[7] National Weather Service, Area Forecast Discussion, Sep., 21, 2017, Phoenix office, 245am MST

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 Mexico and the site furthest north is the Palm Springs Fire Station

TABLE 2-1
HOURLY CONCENTRATIONS OF PARTICULATE MATTER

SITE	DATE	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Hrly MAX	24-HR AVERAGE
PS FIRE STATION	20170920	23	22	24	22	14	15	16	18	16	26	22	20	24	27	24	23	18	16	23	31	37	32	26	24	37	22
	20170921	19	17	17	24	23	17	18	15	22	19	19	18	14	17	9	5	10	8	9	8	13	13	14	16	**24**	15
	20170922	11	11	11	13	13	11	13	15	15	15	13	16	18	14	19	15	21	25	30	34	27	29	28	26	34	18
INDIO	20170920	40	42	36	29	25	32	39	38	37	24	21	22	19	23	23	22	27	50	50	34	33	41	39	33	50	32
	20170921	25	28	24	41	24	27	29	36	38	38	47	50	44	90	57	131	15	16	19	30	56	33	54	20	**131**	40
	20170922	45	22	21	26	23	25	24	42	39	19	8	7	5	13	8	17	15	29	33	36	43	38	35	34	45	25
MECCA	20170920	28	29	28	19	24	32	57	47	31	35	25	24	35	30	31	5	22	42	60	55	29	31	71	129	129	38
	20170921	43	24	27	58	55	45	67	42	28	32	53	101	114	393	875	1047	413	64	25	121	264	50	48	21	**1047**	167
	20170922	35	36	28	21	21	34	41	34	50	49	19	9		7	10	23	14	49	60	52	42	38	36	30	60	32
TORRES MARTINEZ	20170920	26	26	26	83	25	26	27	28	32	30	32	25	29	32	35	27	26	46	41	38	34	32	43	54	83	34
	20170921	49	37	22	30	31	47	30	31	25	18	26	124	451	212	308	1371	247	87	225	16	36	28	117	32	**1371**	150
	20170922	25	21	17	14	14	17	39	26	21	13	17	9	12	15	10	19	8	16	27	27	59	58	40	37	59	23
WESTMORLAND	20170920	22	24	48	100	83	559	133	81	38	30	25	26	30	30	66	63	86	229	67	29	29	26	63	11	559	79
	20170921	126	320	166	95	17	26	75	57	167	107	101	313	288	123	184	270	110	49	64	169	84	30	20	21	**320**	124
	20170922	17	11	11	10	21	38	51	31	24	16	34	16	18	23	14	10	11	24	79	27	183	99	77	36	183	36
BRAWLEY	20170920	15	19	26	26	36	32	49	36	41	28	26	24	30	22	27	32	73	111	86	29	22	23	13	26	111	35
	20170921	13	82	145	87	25	15	58	60	139	187	204	115	390	281	131	395	167	65	177	243	332	36	12	18	**395**	140
	20170922	14	13	12	20	18	24	35	30	38	21	20	16	15	7	18	17	18	21	45	57	47	25	22	19	57	23
NILAND	20170920	18	20	24	25	36	42	61	58	55	59	21	22	18	25	31	26	23	28	135	37	19	13	14	9	135	34
	20170921	23	33	20	28	32	41	28	79	185	80	124	328	184	259	139	93	70	97	84	71	63	53	39	31	**328**	91
	20170922	20	11	12	11	14	16	30	44	22	13	17	17	13	7	6	4	5	6	9	24	27	23	20	20	44	16
EL CENTRO	20170920	11	7	11	23	32	51	96	69	48	36	38	44	35	37	32	33	35	48	55	35	36	37	46	35	96	38
	20170921	27	30	31	45	30	29	71	69	40	31	157	218	393	122	69	157	98	30	37	36	30	28	35	22	**393**	76
	20170922	13	20	18	20	22	19	23	36	24	26	18	16	15	12	18	18	17	12	56	42	33	27	24	25	56	23
CALEXICO	20170920	14	16	45	73	65	72	155	82	52	31	24	34	51	35	55	41	53	49	56	34	35	32	36	27	155	48
	20170921	27	45	25	26	31	57	80	98	82	41	33	103	985	985	308	985	657	274	985	486	125	44	29	43	**985**	273
	20170922	17	21	53	76	29	93	60	47	33	47	31	53	17	13	21	20	19	21	64	57	57	53	45	31	93	40
YUMA SUPERSITE (PST)	20170920	16	17	12	24	51	85	74	108	34	24	19	18	16	17	9	22	31	44	45	22	16	14	13	14	108	31
	20170921	17	16	18	19	35	52	53	41	34	46	52	18	23	35	222	144	136	370	234	151	99	61	72	58	**370**	83
	20170922	42	25	17	18	53	22	23	36	24	27	14	17	20	28	18	19	16	101	45	39	35	57	47	38	101	32
YUMA SUPERSITE (MST)	20170919	5	8	9	9	12	16	19	19	29	25	23	20	20	30	31	45	40	46	45	40	44	34	28	16	46	25
	20170920	12	16	17	12	24	51	85	74	108	34	24	19	18	16	17	9	22	31	44	45	22	16	14	13	108	30
	20170921	14	17	16	18	19	35	52	53	41	34	46	52	18	23	35	222	144	136	370	234	151	99	61	72	**370**	81
	20170922	58	42	25	17	18	53	22	23	36	24	27	14	17	20	28	18	19	16	101	45	39	35	57	47	101	33
	20170923	38	30	24	23	22	24	27	29	31	41	44	25	28	20	25	22	40	20	27	46	59	67	31	33	67	32

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

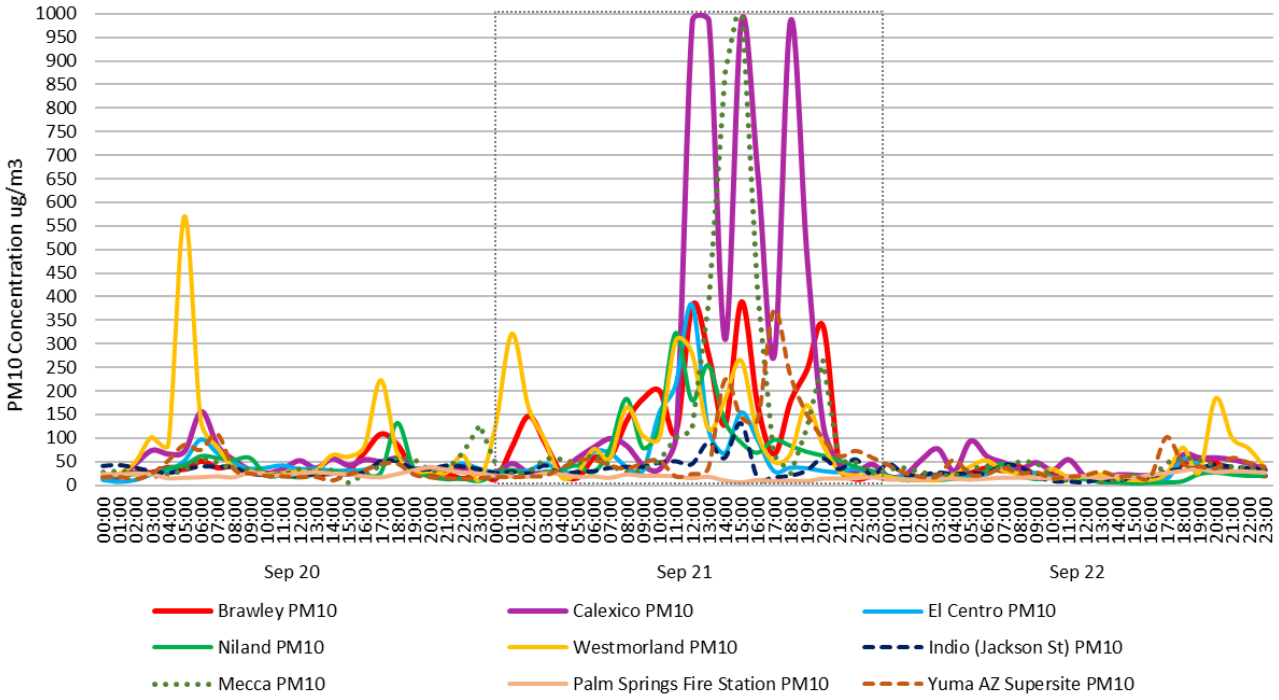


Fig 2-2: is a three-day graphical representation of the PM_{10} concentrations measured at the sites identified in **Table 2-1**. Elevated concentrations at the Calexico monitor combined with emissions from Mexicali, Mexico, significantly affected by the Laguna Salada in Mexico

Wind speed, wind direction and the airflow patterns combined all help explain how windblown emissions resulting from the strong gusty westerly winds associated with the passing of a trough of low pressure over the western states affected air quality monitors in Imperial County.[8]

As mentioned above, nine (9) Urgent Weather Messages were issued by the NWS offices in San Diego and Phoenix advising of advisory level westerly winds for the San Diego Mountains and desert slopes and Imperial County (**Appendix A**).

Figures 2-3 and 2-4 depict the compiled wind data for regional and neighboring airports and upstream sites. Airports within Imperial County and eastern Riverside County measured wind speeds at or above 25 mph while airports in the mountains of southern San Diego County and western Yuma, Arizona County measured wind gusts at or above 25 mph. The airport in Mexicali, Mexico measured winds just under 25 mph. Sites in **Figure 2-4** just west of Calexico in Imperial County measured elevated wind speeds coincident with measured elevated concentrations at the monitor.

[8] National Weather Service, Area Forecast Discussion, Sep., 18, 2017, San Diego office, 357am PDT

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

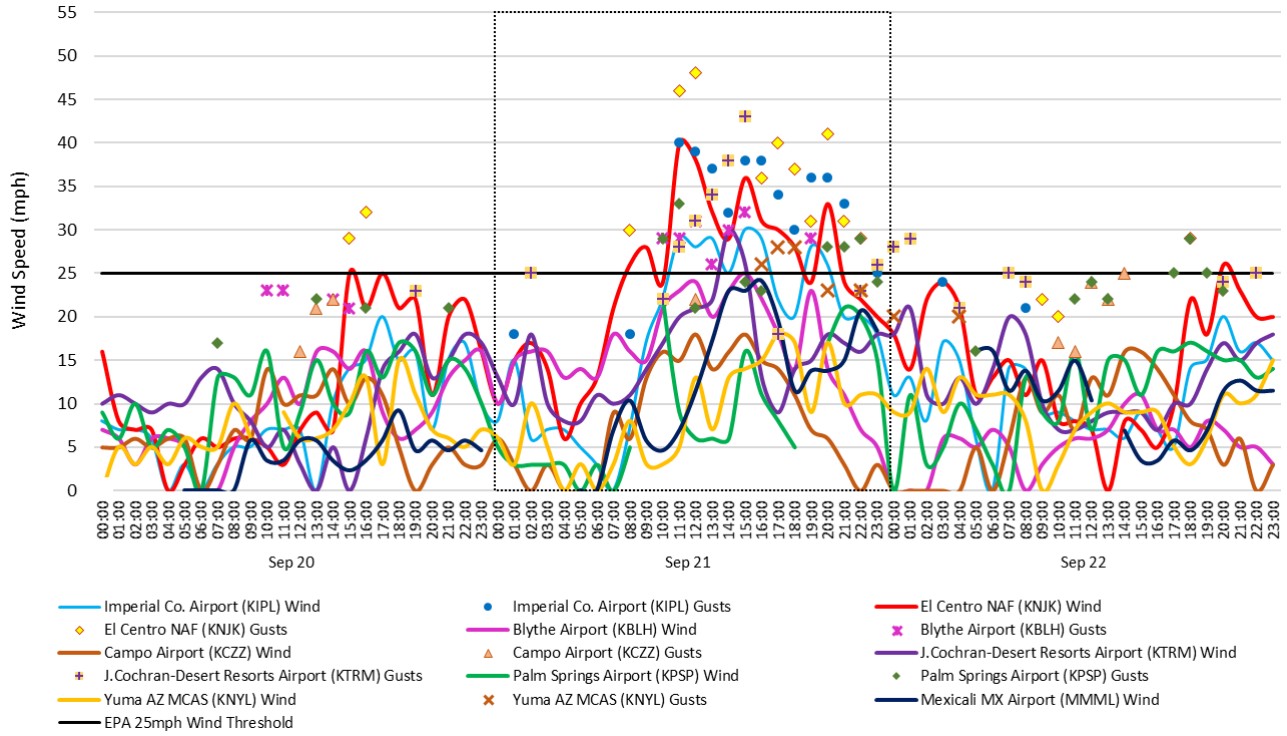


Fig 2-3: is a three-day graphical representation of the measured wind speed and wind gust (if available) from local and neighboring airports. Note the elevated wind speeds are consistent for sites with minor variations. All data derived from the Local Climatological Data Hourly Observations (LCDHO) reports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

FIGURE 2-4
WIND SPEEDS AND GUSTS AT UPWIND SITES

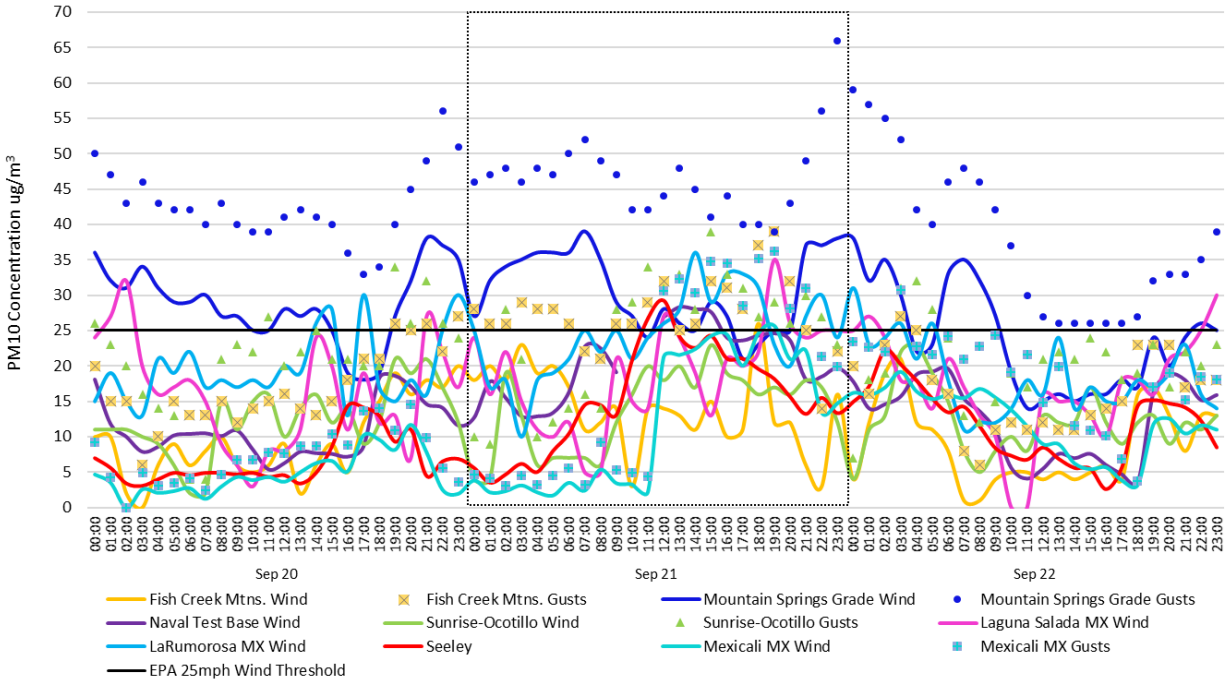


Fig 2-4: is a three-day graphical representation of the measured wind speed and wind gust (if available) from sites located upstream from the Niland monitor. All data (except Laguna Salada from Weather Underground) derived from the University of Utah's Meso West https://mesowest.utah.edu/index.html

The National Oceanic and Atmospheric Administration (NOAA) Laboratory HYSPLIT back-trajectory models[9] provide supporting evidence of the westerly airflow within Imperial County on September 21, 2017. The HYSPLIT back-trajectory models in **Figure 2-5 through 2-7** depict the airflow during the morning (0100 PST), the afternoon (1200 (PST) and evening (2000) hours to help illustrate the shift of airflow from a northwesterly direction, to a southwesterly direction and as the system passed into Arizona back to a westerly airflow. It became evident to the NWS, just before the issuance of Urgent Weather Messages that the strongest winds would occur during the afternoon to evening hours.[10] **Figure 2-5** depicts the general airflow from a slight northwest direction coincident with the elevated concentrations at the Brawley and Westmorland monitors above 100 µgm^3. **Figure 2-6** depicts the mid-day (afternoon) slight airflow shift to the southwest coincident with elevated concentrations at the Calexico monitor. The HYSPLIT

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

[10] National Weather Service, Area Forecast Discussion, Sep., 20, 2017, San Diego office, 218am PST and 938am PDT

includes both Mexicali and the Mexicali Airport. Note, airflow crosses over the Laguana Salada in Mexico. While all air quality monitors measured elevated concentrations consistent with the shift of airflow, the Calexico monitor was significantly affected by emissions from Mexico. This is coincident with elevated wind speeds and gusts at Sunrise-Ocotillo, Seeley, El Centro NAF, Imperial County Airport, and Laguna Salada, Mexico that were upwind from Calexico (**Figure 2-4**). **Figure 2-7** depicts the shift back to a general west airflow and the coincident lower level of concentrations below 100 µg/m^3.

FIGURE 2-5
HYSPLIT MODEL IMPERIAL COUNTY SITES SEPTEMBER 21, 2017 0100 PST

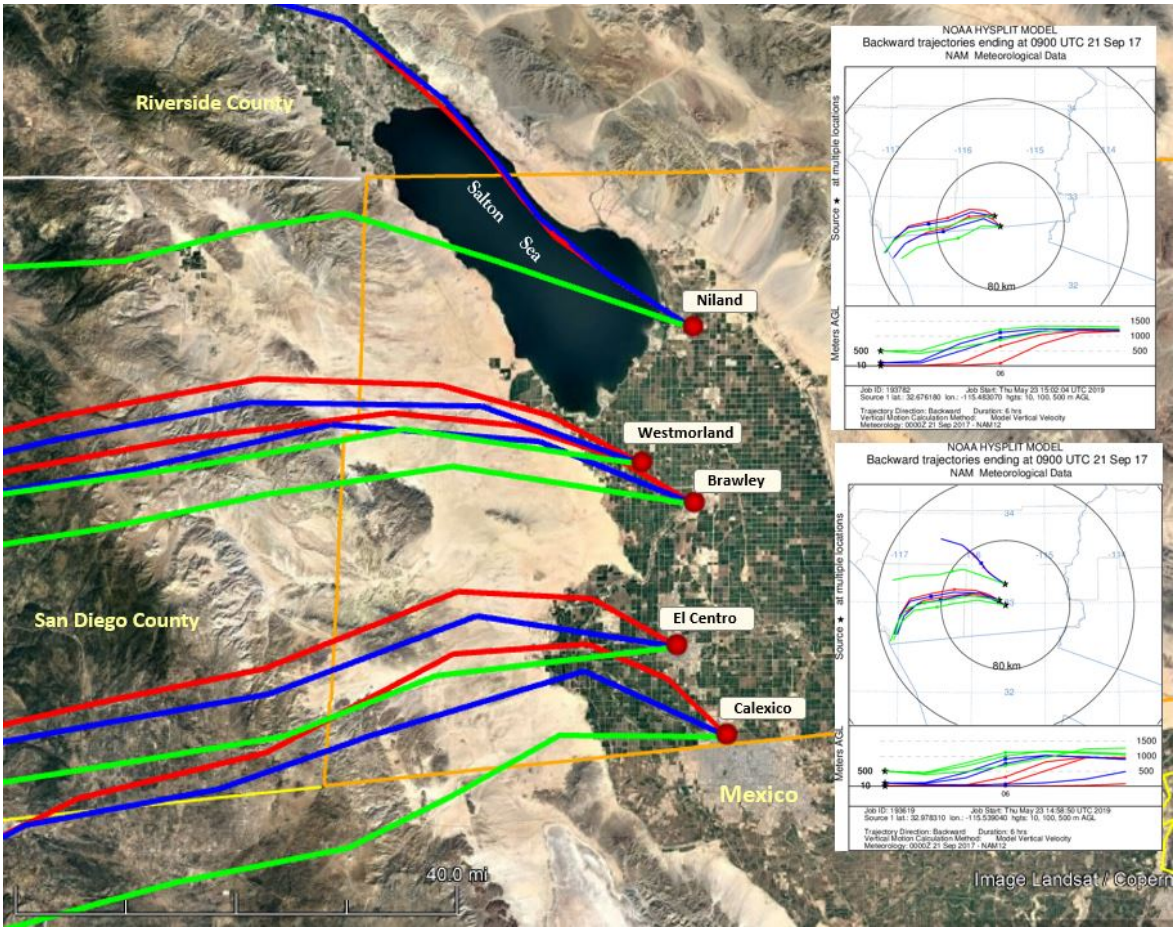


Fig 2-5: A 6-hour back-trajectory ending at 0100 PST for all monitors in Imperial County. Note the While Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

FIGURE 2-6
HYSPLIT MODEL ALL SITES SEPTEMBER 21, 2017 1200 PST

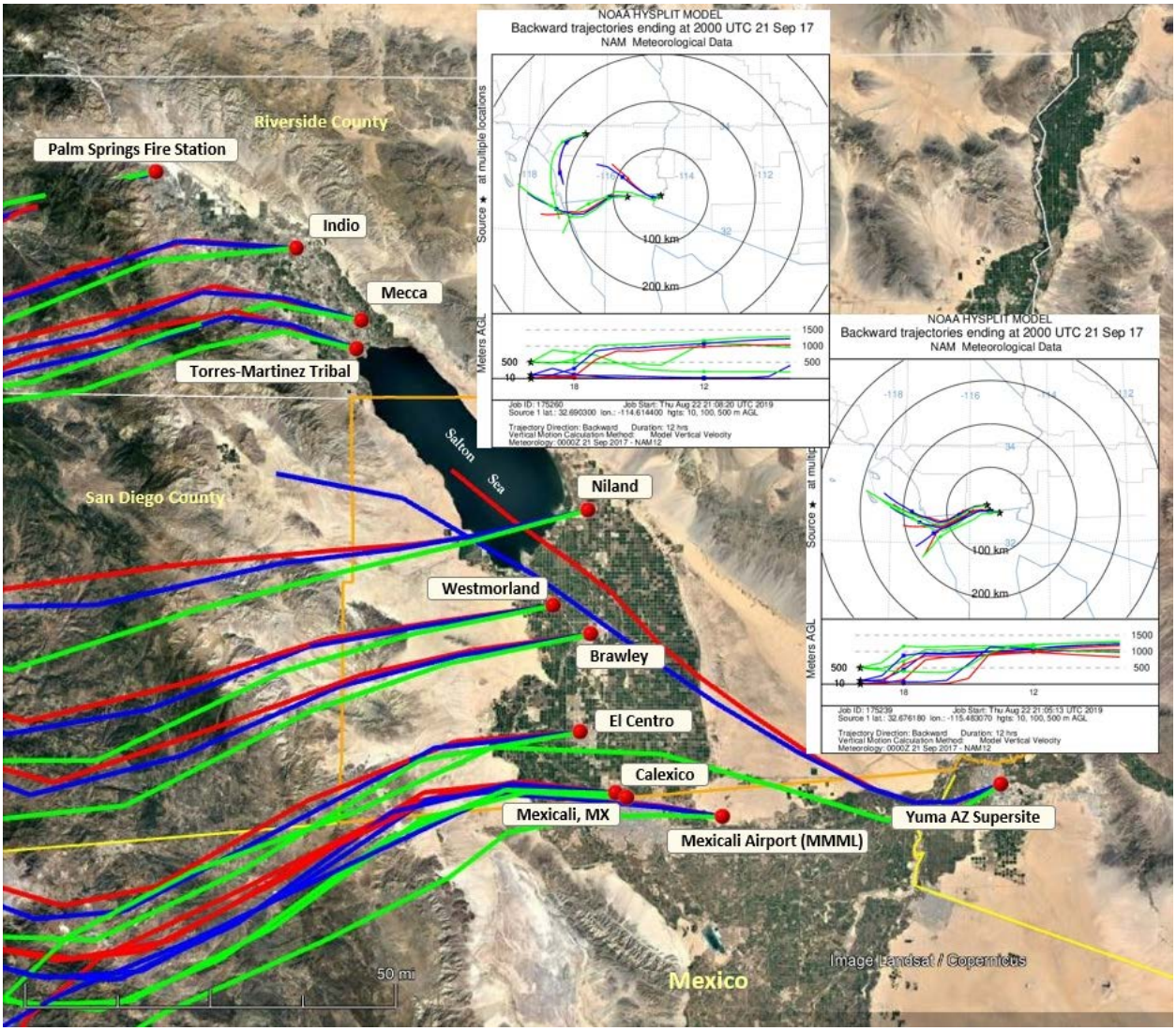


Fig 2-6: A 12-hour back-trajectory ending at 1200 PST for all sites identified in **Table 2-1** and including Mexicali and the Mexicali Airport. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

FIGURE 2-7
HYSPLIT MODEL ALL SITES SEPTEMBER 21, 2017 2000 PST

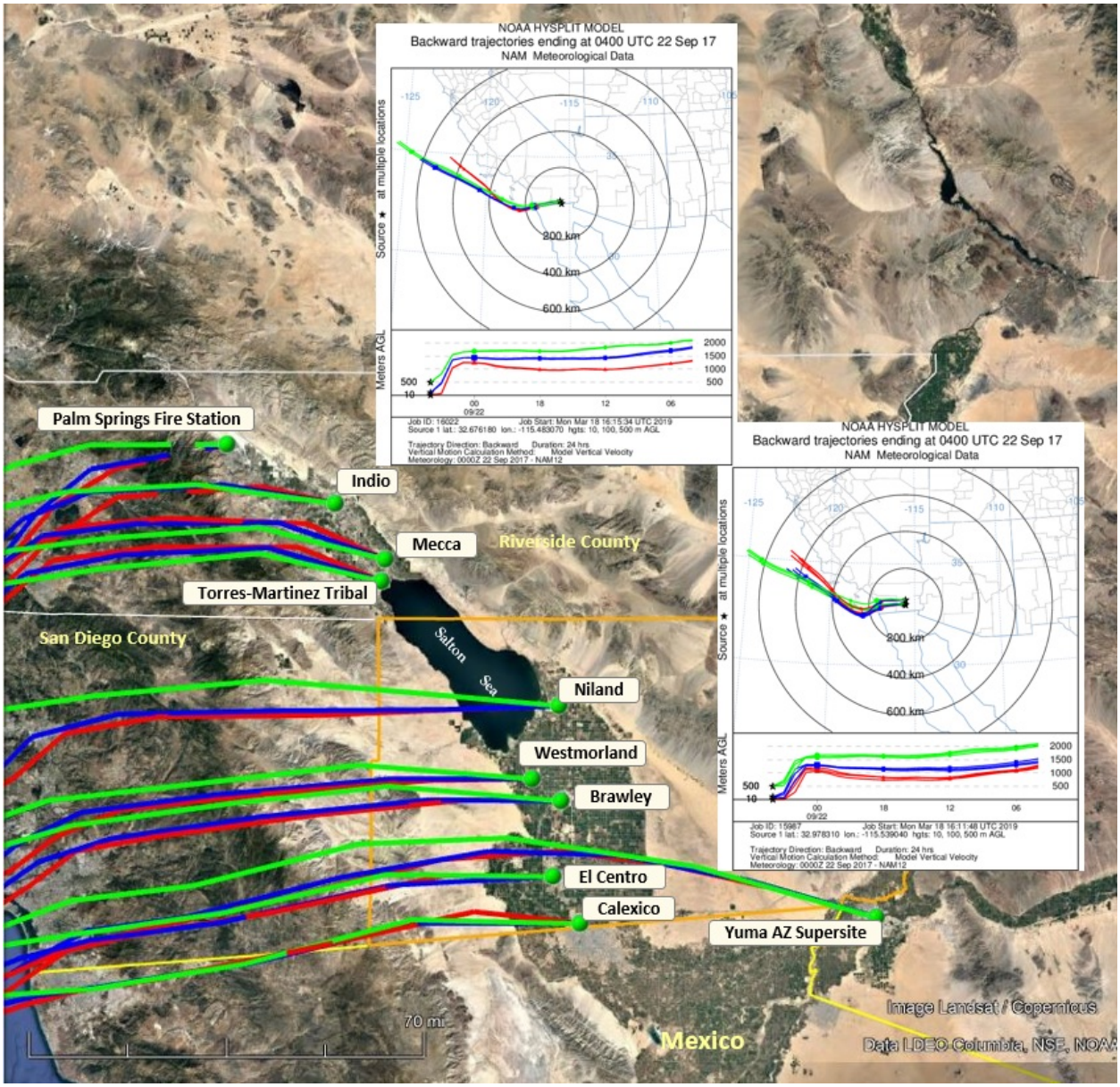


Fig 2-7: A 24-hour back-trajectory ending at 2000 PST for all sites. Note the surface level airflow is now due west as opposed to the earlier trajectories. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

As strong gusty westerly winds blew over open natural mountains and desert areas west of Imperial County, fugitive windblown dust primarily affected all air quality monitors throughout the region, specifically the Calexico monitor. As the NWS offices realized that winds would increase to advisory level, nine (9) Urgent Weather Messages were issued advising of wind speeds in excess of 25 mph and gusts above 40 mph. Imperial County

Airport (KIPL) and the El Centro Naval Air Facility (NAF) (KNJK) measured winds or gusts above 25 mph, KIPL measured peak winds at 30 mph and peak gusts of 40 mph. KNJK measured peak winds of 40 mph and peak gusts of 48 mph. Meteorological monitors upwind from Calexico at Mountain Springs Grade, Sunrise-Ocotillo, Seeley, and Laguna Salada (Mexico) all measured winds and/or gusts in excess of 25 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 unseasonably deep trough moved through the region with an associated frontal system. Strong afternoon and evening gusty westerly winds ahead of the front affected southern California and western Arizona. The system was largely moisture starved according to the NWS. Because of this, windblown dust from outlaying naturally open mountain and desert areas located to the west of Imperial County blew into Imperial County and causing an exceedance at the Calexico monitor.

As early as September 18, 2017 the San Diego NWS office described the approaching trough and the resulting strong and gusty westerly winds over and through the San Diego County Mountains and deserts.[11] Forecasts on Tuesday, September 19, 2017 continued to point to windy conditions across southeastern California due to a tightening pressure gradient in response to a deepening low over Utah.[12] By September 20, 2017 the NWS realized advisory level winds, resulting from the amplification of a longwave trough moving over the Western US Thursday and Friday.[13] Forecasted gusts through the San Diego Mountain passes and adjacent desert slopes were expected to exceed 50 mph.

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.[14] Elevated strong afternoon and evening gusty westerly winds generated and transported windblown dust from outlaying open natural mountains and deserts into Imperial County causing air quality to degrade. 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, both NWS office, in San Diego and Phoenix, issued Urgent Weather Messages advising of advisory level winds affecting the San Diego Mountains, desert slopes and all of Imperial County (**Appendix A**).

At 1900 PST NOAA's Satellite Smoke Text Product identified a "batch of thin density blowing dust" during the afternoon across the desert region of southeastern California (**Appendix C**).

[11] National Weather Service, Area Forecast Discussions, Sep., 18, 2017, San Diego office, 357am PDT; 917am PDT; 154pm PDT; and 844pm PDT
[12] National Weather Service, Area Forecast Discussions, Sep., 19, 2017, Phoenix office, 257am MST; and 123pm MST;
[13] National Weather Service, Area Forecast Discussion, Sep., 19, 2017, San Diego office, 931am PDT
[14] 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 3-2 below provides an illustration of some of the meteorological conditions, as described above and demonstrated in the HYSPLITS, on September 21, 2017, which affected air quality in Imperial County causing an exceedance at the Calexico monitor. Although the air monitors in Brawley and Westmorland had 24-hour averages well above 100 µg/m^3 the Calexico monitor was significantly affected by emissions from Mexico, specifically within the Laguana Salada. As windblown dust emissions, generated within the natural open mountains within San Diego and Mexico blew into Imperial County and Mexico, outlaying natural open deserts combined emissions affecting the Calexico monitor. It would be unreasonable to believe the emissions stopped at the international border so a very reasonable assumption could be made that Mexicali was similarly affected. Overall, air quality in Imperial and Mexicali were significantly affected by the strong gusty westerly winds.

FIGURE 3-1
RAMP-UP ANALYSIS AS DISCUSSED FOR SEPTEMBER 21, 2017

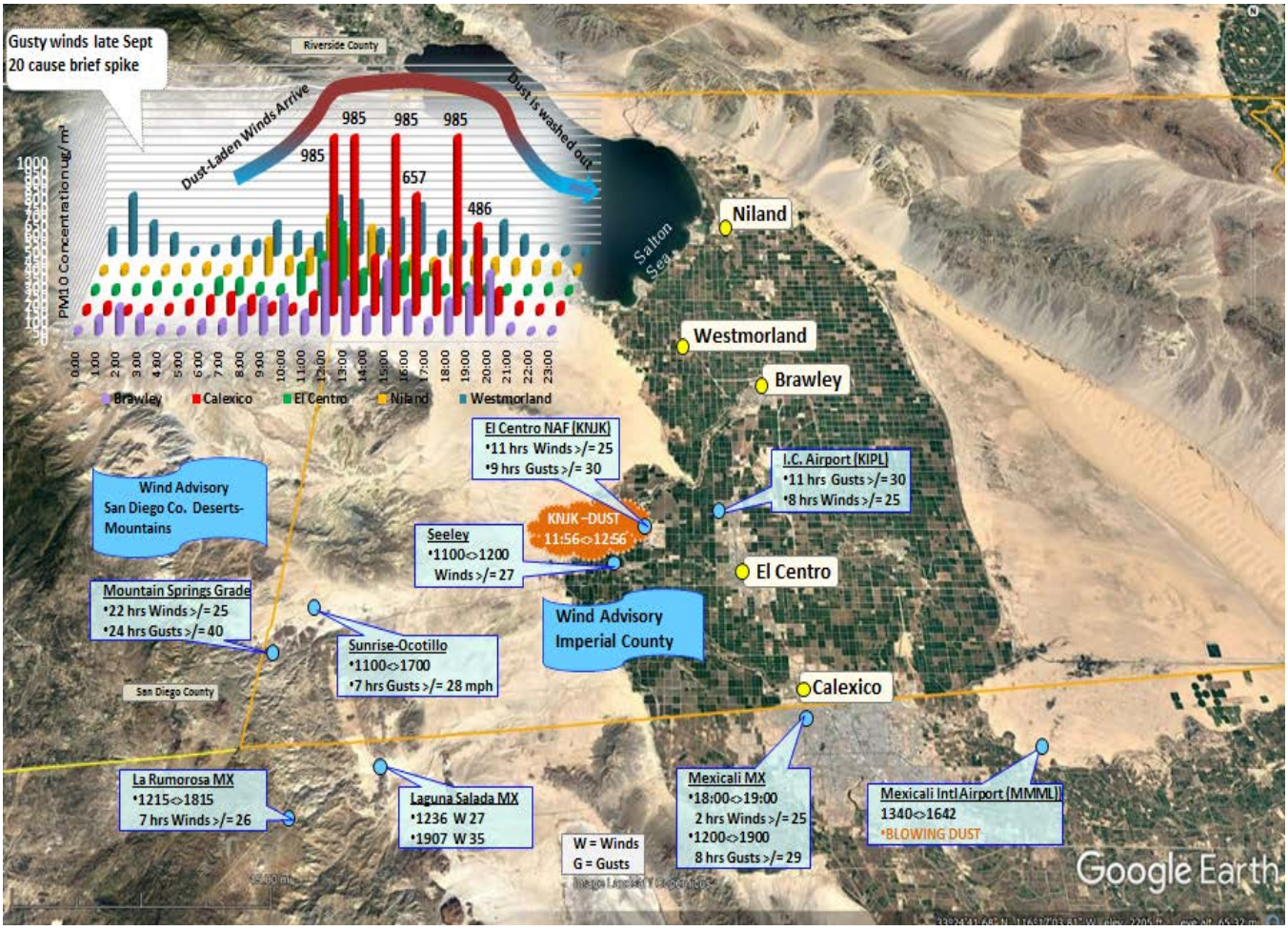


Fig 3-1: Upwind locations west and slightly WNW of Calexico measured strong winds and gusts coincident with elevated hourly PM_{10} concentrations at Calexico during the 1200 PST hour. Air quality data is from the EPA's AQS data bank. Google Earth base map

An indicator of the affect to air quality can be discerned from the level of visibility at any given time and day. While the ICAPCD air monitoring stations do not measure levels of visibility the local and surrounding airports do.[15]

The Imperial County Airport (KIPL), the El Centro Naval Air Facility (KNJK) and the Mexicali Mexico Airport (MMML) 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 and 3-2** provide information regarding the reduced visibility in Imperial and Mexicali 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, **Tables 3-1 and 3-2** provide a temporal relationship of wind speeds, wind direction, wind gusts (if available), and PM_{10} concentrations at all the air quality monitors in Imperial County. Together, the data provides the supporting relationship between the elevated winds and reduced visibility.

According to the compiled information found in **Figure 3-2**, visibility reduced at three of the major airports, the El Centro NAF (KNJK), the Imperial County Airport (KIPL) and the Mexicali Mexico Airport (MMML) during the afternoon hours of September 21, 2017 coincident with the elevated hourly concentrations at the air quality monitors in Imperial County and in particular at the Calexico monitor.

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

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

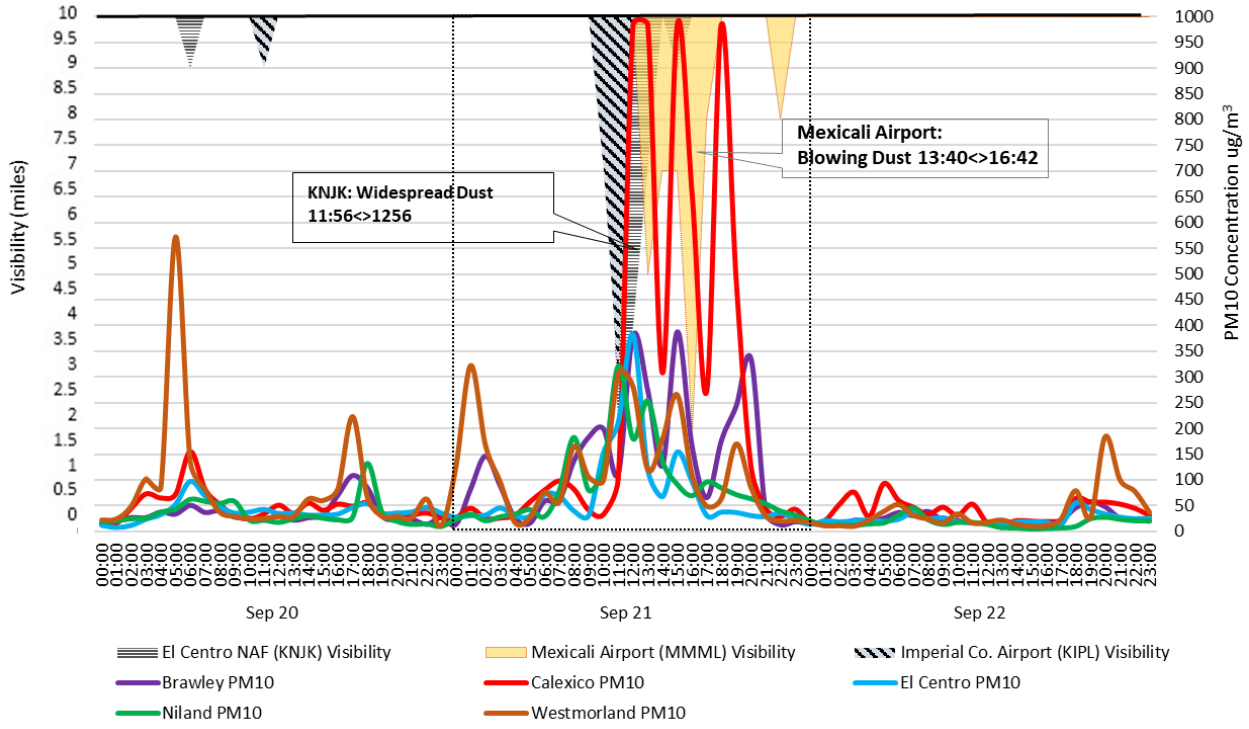


Fig 3-2: is a graphical representation of the compiled data from the Imperial County Airport (KIPL), the El Centro NAF (KNJK) and the Mexicali Mexico Airport (MMML). Reported reduced visibility is coincident with elevated winds and hourly levels of concentrations at air quality monitors. Visibility data from the NCEI's QCLCD data bank

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

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

TABLE 3-1
WIND SPEEDS AND PM_{10} CONCENTRATIONS SEPTEMBER 21, 2017

LA RUMOROSA, MX (IBAJACAL21)			LAGUNA SALADA, MX (IBCLARUM2)			MEXICALI, MX (MXCB1)				MEXICALI MX AIRPORT (MMML)				CALEXICO			
HOUR	W/S	W/D	HOUR	W/S	W/D	HOUR	W/S	W/G	W/D	HOUR	W/S	W/D	Obs.	HOUR	W/S	W/D	PM_{10} ($\mu g/m^3$)
0014	**25**	360	0005	24	225	0000	4	**5**	319	0040				0000	1	325	27
0114	17	210	0105	16	210	0100	2	**4**	53	0140				0100	1	244	45
0214	18	360	0205	22	225	0200	2	**3**	234	0240				0200	0	39	25
0314	10	225	0305	15	225	0300	3	**4**	16	0340				0300	0	190	26
0414	18	360	0405	11	270	0400	2	**3**	321	0440				0400	0	21	31
0514	19	360	0505	10	270	0500	2	**5**	39	0540	0			0500	1	105	57
0614	21	360	0605	12	270	0600	4	**6**	105	0649	0			0600	1	90	80
0744	**25**	270	0705	5	225	0700	2	**3**	136	0747	7	330		0700	1	17	98
0845	22	360	0806	5	225	0800	5	**9**	335	0845	10	350		0800	3	301	82
0930	**25**	360	0936	21	210	0900	3	**5**	317	0942	6	310		0900	2	271	41
1000	21	270	1021	15	225	1000	3	**5**	326	1049	5	320		1000	1	280	33
1100	24	270	1121	14	225	1100	2	**4**	332	1150	7	340		1100	6	297	**103**
1215	**26**	270	1236	**27**	210	1200	21	**31**	293	1248	12	290		1200	16	286	**985**
1315	**28**	270	1336	24	210	1340	22	**32**	291	1340	17	280	**BLDU**	1300	17	286	**985**
1400	**36**	360	1421	19	210	1420	22	**30**	292	1440	23	300	**BLDU**	1400	16	288	**308**
1515	**29**	360	1506	13	210	1500	24	**35**	290	1545	23	300	**BLDU**	1500	19	287	**985**
1630	**33**	360	1621	21	225	1630	24	**35**	286	1642	24	280	**BLDU**	1600	19	280	**657**
1745	**33**	360	1721	20	225	1700	20	**29**	282	1741	20	300		1700	17	291	**274**
1815	**31**	270	1837	22	210	1800	**25**	**35**	295	1821	12	290		1800	20	293	**985**
1901	23	270	1907	**35**	225	1900	**26**	**36**	295	1953	14	280		1900	17	302	**486**
2001	20	270	2007	**26**	210	2000	21	**28**	300	2050	14	310		2000	16	300	**125**
2116	**27**	270	2107	24	240	2100	22	**31**	293	2148	15	300		2100	13	303	44
2201	**30**	360	2237	**25**	240	2200	13	**21**	277	2251	21	300		2200	11	308	29
2301	24	360	2307	**25**	240	2300	15	**20**	344	2341	18	280		2300	11	326	43

Wind Data for LaRumorosa and Laguna Salada from the Weather Underground. Wind data for Mexicali Airport (MMML) and for Mexicali MX (MXCB1) from the University of Utah's MesoWest system. Calexico air quality data from the EPA's AQS repository. Wind speeds = mph; Direction = degrees. BLDU = blowing dust. DU = widespread dust. Due to the different times that wind data and air quality data is sampled at various sites, the hour given represents the hour in which the measurement was taken

TABLE 3-2
WIND SPEEDS AND PM_{10} CONCENTRATIONS SEPTEMBER 21, 2017

	MOUNTAIN SPRINGS GRADE (TNSC1)			SUNRISE-OCOTILLO (IMPSD)			IMPERIAL COUNTY AIRPORT (KIPL)			SEELEY		EL CENTRO NAF (KNJK)				BRLY	CX	EC	NLND	WSTMLD
HOUR	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/D	W/S	W/G	W/D	Obs.	PM_{10} (µg/m^3)				
0050	27	46	211	4	10	122	8		280	6	283	10		250		13	27	27	23	126
0150	32	47	209	4	9	253	15	18	280	4	233	15		260		82	45	30	33	320
0250	34	48	221	19	28	230	6		290	5	282	17		260		145	25	31	20	166
0350	35	46	213	13	21	239	7		290	6	283	14		260		87	26	45	28	95
0450	36	48	213	6	10	196	7		300	5	233	6		280		25	31	30	32	17
0550	36	47	211	7	12	196	5		310	8	271	10		280		15	57	29	41	26
0650	36	50	213	7	14	213	3		350	10	280	13		270		58	80	71	28	75
0750	39	52	206	7	16	239	0		0	15	297	21		270		60	98	69	79	57
0850	35	49	211	6	14	344	7	18	210	15	296	26	30	280		139	82	40	185	167
0950	29	47	207	12	28	253	17		260	13	289	28		270		187	41	31	80	107
1050	27	42	212	16	29	251	22		270	21	289	24		280		204	33	157	124	101
1150	24	42	227	20	34	266	29	40	280	27	287	40	46	280	DU	115	103	218	328	313
1250	28	44	225	18	31	264	28	39	270	29	286	38	48	270	DU	390	985	393	184	288
1350	26	48	234	20	33	269	29	37	270	24	283	32		250		281	985	122	259	123
1450	25	45	237	17	28	255	25	32	270	23	285	29		260		131	308	69	139	184
1550	29	41	238	23	39	273	30	38	270	24	288	36		250		395	985	157	93	270
1650	27	44	236	19	33	268	29	38	260	21	277	31	36	250		167	657	98	70	110
1750	21	40	221	18	31	267	22	34	260	21	282	30	40	260		65	274	30	97	49
1850	23	40	237	16	27	261	20	30	260	20	282	28	37	270		177	985	37	84	64
1950	25	39	236	17	29	259	28	36	260	18	302	24	31	260		243	486	36	71	169
2050	25	43	227	16	26	264	26	36	270	16	323	33	41	270		332	125	30	63	84
2150	37	49	218	18	30	294	20	33	280	13	312	24	31	270		36	44	28	53	30
2250	37	56	208	17	27	275	20		280	16	310	22	29	290		12	29	35	39	20
2350	38	66	207	12	23	250	18	25	280	13	298	20		290		18	43	22	31	21

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

As mentioned above there were nine (9) Urgent Weather Messages issued by the NWS offices in San Diego and Phoenix, combined. The Urgent Weather Messages contained wind advisories describing the strong gusty westerly winds blowing over the San Diego Mountains, through the desert slopes and onto the desert floor of Imperial County. As the approaching deep trough moved into the region, prefrontal winds increased across southeastern California and affected different regional air monitors in Riverside County, Imperial County and Arizona (**Table 2-1**).

The ICAPCD monitors air quality for each of its stations and issues web-based Air Quality Indices in response to changes in air quality.[17] As transported windblown dust entered Imperial County due to increasing winds caused by the weather system, air quality for the Calexico area rapidly degraded to unhealthy levels. **Figure 3-4** illustrates the level of air quality degradation, from the transport of windblown dust carried into Imperial Count as the trough travelled south affecting Southern California. Overall, the strong afternoon gusty westerly winds associated with the moving trough affected air quality in Imperial County.

FIGURE 3-3
IMPERIAL VALLEY AIR QUALITY INDEX FOR CALEXICO SEPTEMBER 21, 2017

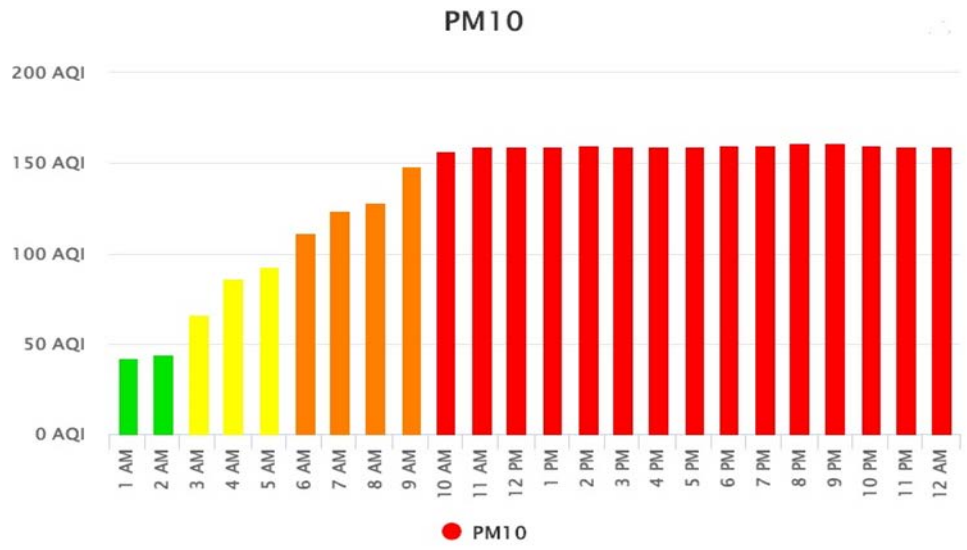


Fig 3-5: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Green" or Good level to a "Red" or Unhealthy level

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

III.1 Summary of Forecasts and Warnings

Area Forecast Discussions issued by the NWS offices in Phoenix and San Diego described the amplification of a broad longwave trough over the Western US by the reinforcement by a pair of shortwave troughs.[18] Both NWS offices issued several Area Forecast Discussions anticipating gusty westerly winds through the region. However, it wasn't until September 20, 2017 that the NWS offices realized the magnitude of the winds and between the both offices issued nine (9) separate Urgent Weather Messages in anticipate of advisory level winds within the San Diego Mountains, adjacent deserts and Imperial County.[19] **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 upstream from the Calexico monitor. Data analysis indicates that on September 21, 2017 different sites measured wind speeds at or above 25 mph.

[18] National Weather Service, Area Forecast Discussion, Sep., 18, 2017, San Diego office, 154pm PDT

[19] National Weather Service, Area Forecast Discussion, Sep., 20, 2017, San Diego office, 218am PDT and 938am PDT

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

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

Figures 4-1 and 4-2 show the time series of available FRM and BAM 24-hr PM_{10} concentrations at the Calexico monitor for the period of January 1, 2010 through September 21, 2017. The compiled data set below includes non-regulatory data prior to 2013. As a consequence, continuous monitoring data (hourly concentrations) prior to 2013 were not reported into the US EPA Air Quality System (AQS).[20] 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 September 21, 2017, as measured by the Calexico monitor, was used to establish the historical and seasonal variability over time.[21] All figures illustrate that the exceedance, which occurred on September 21, 2017, was outside the normal historical concentrations when compared to event and non-event days. Air quality data for all graphs obtained through the EPA's AQS data bank.

[20] 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.

[21] FRM sampling ended December 2016.

FIGURE 4-1
CALEXICO HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO SEPTEMBER 21, 2017

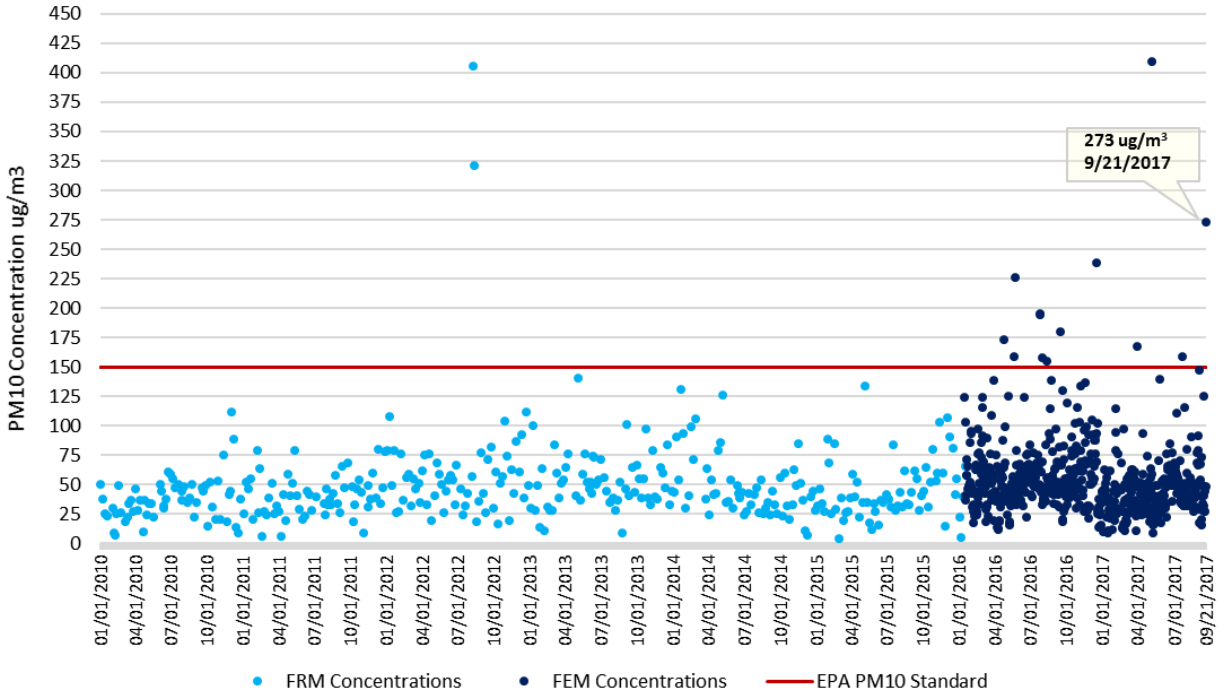
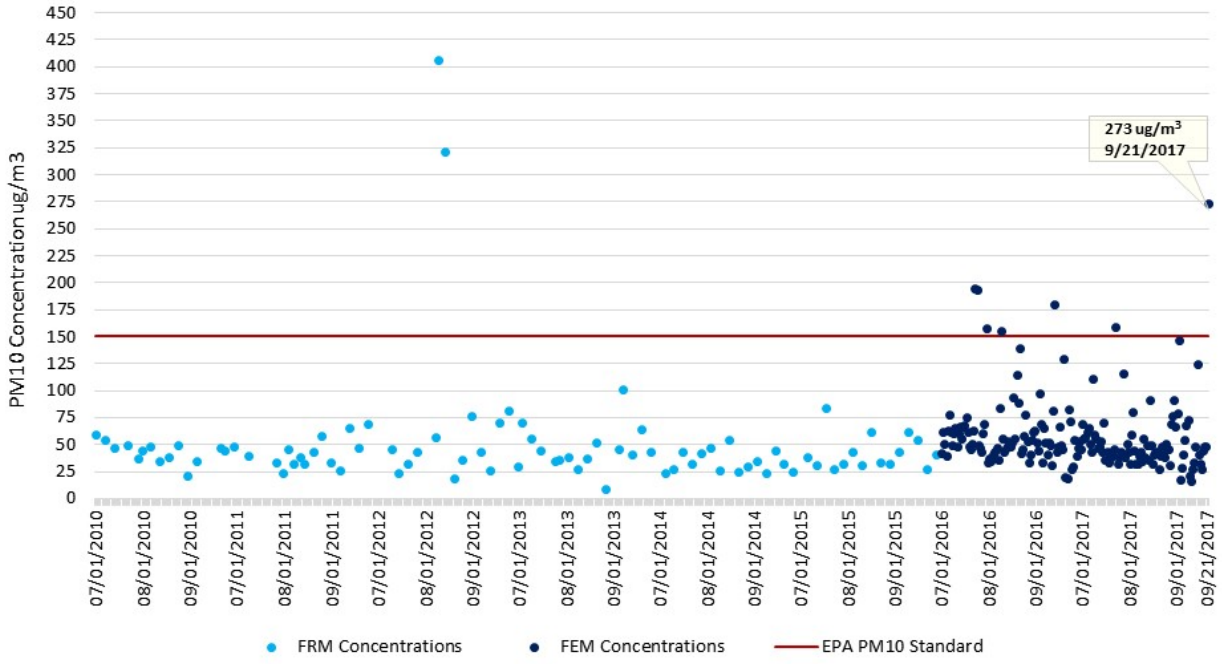


Fig 4-1: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 273 µg/m^3 on September 21, 2017 by the Calexico monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-1,** for Calexico included 1,030 sampling days (January 1, 2010 through September 21, 2017). Of the 1,030 sampling days the Calexico monitor measured 15 exceedance days which translates into an occurrence rate less than 2%. Historically, there was one (1) exceedance day measured during the first quarter, four (4) exceedance days measured during the second quarter, nine (9) exceedance days measured during the third quarter; and one (1) exceedance day measured during the fourth quarter.

FIGURE 4-2
CALEXICO SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***JULY 1, 2010 TO SEPTEMBER 21, 2017**



***Quarterly: July 1, 2010 to September 30, 2016 and July 1, 2017 to September 21, 2017**
Fig 4-2: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 273 µg/m^3 on September 27, 2017 by the Calexico monitor was outside the seasonal concentrations when compared to similar event days and non-event days

Figure 4-2 illustrates the seasonal fluctuations over a period of 282 sampling days, 264 credible samples and nine (9) exceedance days. This translates to less than a 3.5% seasonal exceedance occurrence rate.

Examining the historical and seasonal time series concentrations as they relate to the September 21, 2017 measured exceedance, the exceedance measured on September 21, 2017 is clearly outside the normal concentration levels when comparing to similar event days and non-event days.

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

The analysis above, under the Clear Causal Relationship, indicates that the primary sources affecting air quality in Imperial County originated within the natural open areas of the San Diego and Mexico Mountains and the natural open deserts to the west and southwest of Imperial County. The origination of these emissions from these areas affected Calexico and Mexicali significantly on September 21, 2017. Since Imperial County does not have jurisdiction over emissions emanating from Mexico or San Diego County, it is not reasonably controllable or preventable by Imperial County.

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

Inhalable particulate matter (PM_{10}) contributes to effects that are harmful to human health and the environment, including premature mortality, aggravation of respiratory and cardiovascular disease, decreased lung function, visibility impairment, and damage to vegetation and ecosystems. Upon enactment of the 1990 Clean Air Act (CAA) amendments, Imperial County was classified as moderate nonattainment for the PM_{10} NAAQS under CAA sections 107(d)(4)(B) and 188(a). By November 15, 1991, such areas were required to develop and submit State Implementation Plan (SIP) revisions providing for, among other things, implementation of reasonably available control measures (RACM).

Partly to address the RACM requirement, ICAPCD adopted local Regulation VIII rules to control PM_{10} from sources of fugitive dust on October 10, 1994, and revised them on November 25, 1996. USEPA did not act on these versions of the rules with respect to the federally enforceable SIP.

On August 11, 2004, USEPA reclassified Imperial County as a serious nonattainment area for PM_{10}. As a result, CAA section 189(b)(1)(B) required all BACM to be implemented in

the area within four years of the effective date of the reclassification, i.e., by September 10, 2008.

On November 8, 2005, partly to address the BACM requirement, ICAPCD revised the Regulation VIII rules to strengthen fugitive dust requirements. On July 8, 2010, USEPA finalized a limited approval of the 2005 version of Regulation VIII, finding that the seven Regulation VIII rules largely fulfilled the relevant CAA requirements. Simultaneously, USEPA also finalized a limited disapproval of several of the rules, identifying specific deficiencies that needed to be addressed to fully demonstrate compliance with CAA requirements regarding BACM and enforceability.

In September 2010, ICAPCD and the California Department of Parks and Recreation (DPR) filed petitions with the Ninth Circuit Federal Court of Appeals for review of USEPA's limited disapproval of the rules. After hearing oral argument on February 15, 2012, the Ninth Circuit directed the parties to consider mediation before rendering a decision on the litigation. On July 27, 2012, ICAPCD, DPR and USEPA reached agreement on a resolution to the dispute, which included a set of specific revisions to Regulation VIII. The October 16, 2012 adopted revision reflects the specific revisions to Regulation VIII, which USEPA approved on April 22, 2013. Since 2006, ICAPCD had implemented regulatory measures to control emissions from fugitive dust sources and open burning in Imperial County.

FIGURE 5-1
REGULATION VIII GRAPHIC TIMELINE DEVELOPMENT

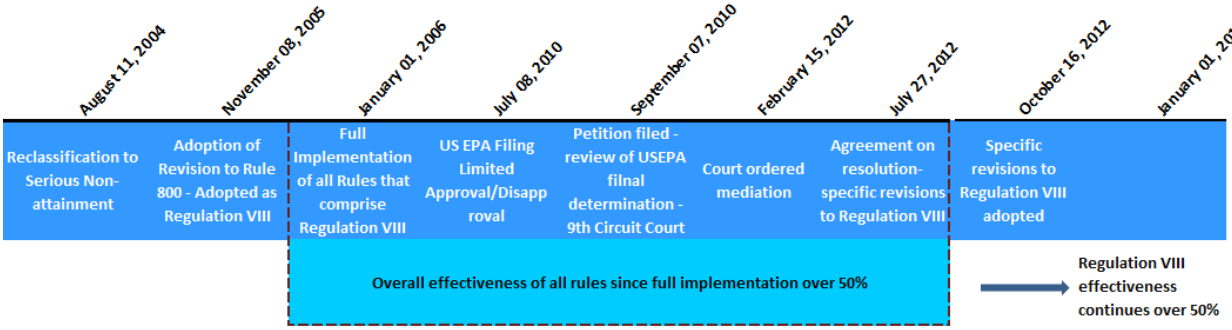


Fig 5-1: Regulation VIII Graphic Timeline

V.1 Wind Observations

As previously discussed, wind data analysis indicates that on September 21, 2017 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 September 21, 2017 event, wind speeds were above the 25 mph threshold, overcoming the BACM in place.

V.2 Review of Source Permitted Inspections and Public Complaints

A query of the ICAPCD permit database was compiled and reviewed for active permitted sources throughout Imperial County and specifically around Calexico during the September 21, 2017 PM_{10} exceedance. Both permitted and non-permitted sources are required to comply with Regulation VIII requirements that address fugitive dust emissions. The identified permitted sources are Aggregate Products, Inc., US Gypsum Quarry, Imperial Aggregates (Val-Rock, Inc., and Granite Construction), US Gypsum Plaster City, Clean Harbors (Laidlaw Environmental Services), Bullfrog Farms (Dairy), Burrtec Waste Industries, Border Patrol Inspection station, Centinela State Prison, various communications towers not listed and various agricultural operations. Non-permitted sources include the wind farm known as Ocotillo Express, and a solar facility known as CSolar IV West. Finally, the desert regions are under the jurisdiction of the Bureau of Land Management and the California Department of Parks (Including Anza Borrego State Park and Ocotillo Wells).

An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM_{10} emissions. While there were no complaints filed on September 21, 2017, officially declared as a No Burn Day, related to agricultural burning or waste burning there was a single fugitive dust complaint filed from Winterhaven, almost 50 miles due east of Calexico near the CA-AZ border. The complaint related to agricultural field disking, however, after investigating there was insufficient evidence to determine any non-compliance. In any event, the site of the disking is located within the far eastern border of Imperial County and could not have affected concentrations at any of the air quality monitors in Imperial County, in particular the Calexico monitor.

FIGURE 5-2
PERMITTED SOURCES

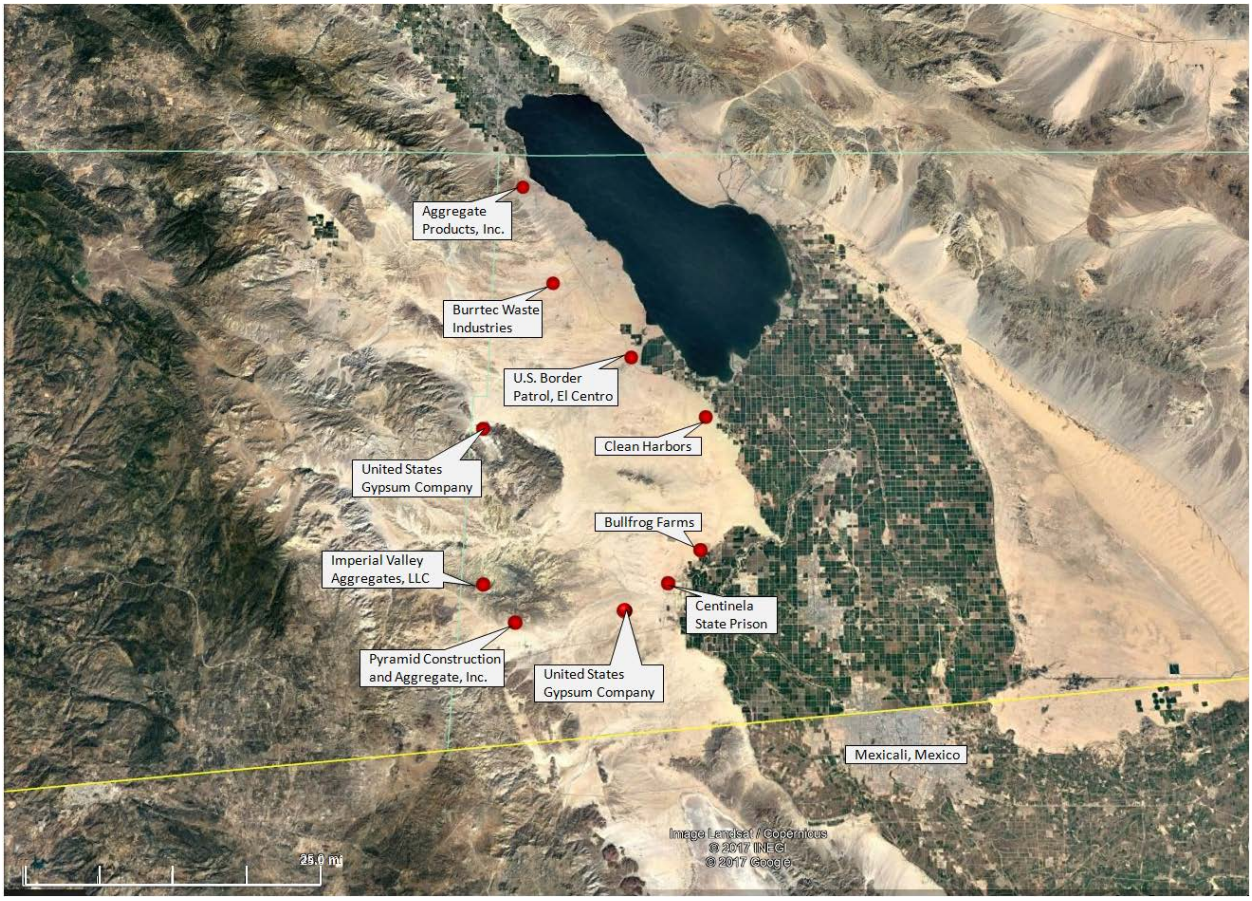


Fig 5-2: The above map identifies those permitted sources located west, northwest and southwest of the Calexico monitor. The green line to the north denotes the political division between Imperial and Riverside counties. The yellow line below denotes the international border between the United States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

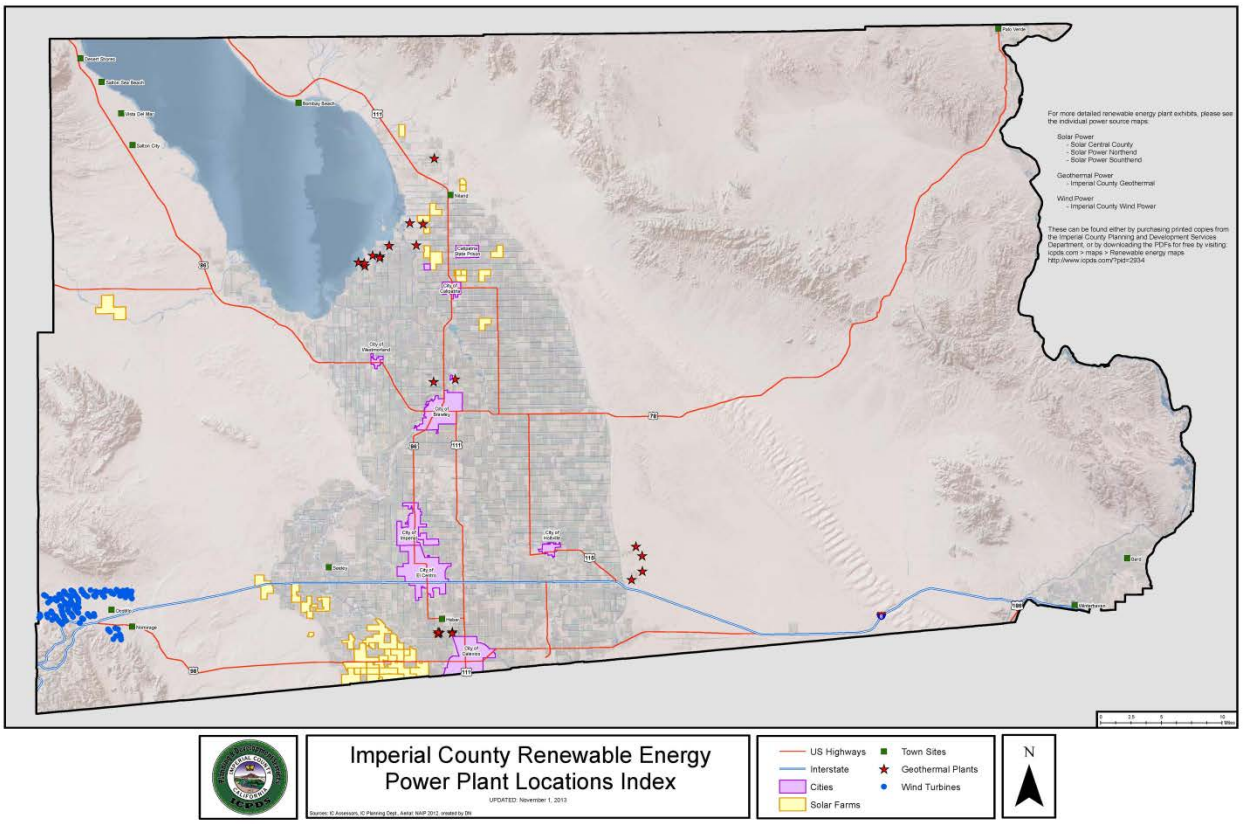


Fig 5-3: The above map identifies those power sources located west, northwest and southwest of the Calexico monitor. Blue indicate the Wind Turbines, Yellow are the solar farms and stars are geothermal plants

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

Typically, Pacific weather disturbances during this time of year will bring westerly winds into the region. The weather disturbance on Thursday, September 21, 2017 resulted when the amplification of a broad longwave trough over the Western US reinforced by a pair of shortwave troughs moved south into Southern California.[22] Strong gusty westerly winds blew through the region and were of a magnitude that prompted the NWS offices in San Diego and Phoenix to issue nine (9) separate Urgent Weather Messages.[23] Strong gusty westerly winds blew over and through the San Diego Mountains and the mountains located within Mexico, generating and transporting dust emissions down slopes onto the open natural desert floor west and southwest of Imperial County.

The exceedance measured at the Calexico monitor on September 21, 2017, was significantly higher in concentration than any of the other air quality monitors. Based on the trajectory analysis, visibility analysis and concentration analysis, strong gusty afternoon westerly winds blew over mountain and desert areas west of Imperial County, however, generated and transported emissions from within Mexicali, Mexico affected both Mexicali and Calexico accounting for the above average level of concentration at the Calexico monitor. Although winds remained elevated the following day, the shift of airflow during the evening, due west allowed for reduced transported emissions. As winds diminished during the late evening hours of September 21, 2017 through the following day likewise concentrations reduced.

Finally, the intensity of the gusty westerly winds was sufficient to overcome BACM in Imperial County.

VI.1 Affects Air Quality

The preamble to the revised EER states that an event is considered to have affected air quality if it can be demonstrated that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation. Given the information presented in this demonstration, particularly Section III, we can reasonably conclude that there exists a clear causal relationship between the monitored exceedance and the September 21, 2017 event, which changed or affected air quality in Imperial County.

[22] National Weather Service, Area Forecast Discussion, Sep., 18, 2017, San Diego office, 154pm PDT

[23] National Weather Service, Area Forecast Discussion, Sep., 20, 2017, San Diego office, 218am PDT and 938am PDT

VI.2 Not Reasonably Controllable or Preventable

In order for an event to be defined as an exceptional event under section 50.1(j) of 40 CFR Part 50 an event must be "not reasonably controllable or preventable." The revised preamble explains that the nRCP has two prongs, not reasonably preventable and not reasonably controllable. The nRCP is met for natural events where high wind events entrain dust from desert areas, whose sources are controlled by BACM, where human activity played little or no direct causal role. This demonstration provides evidence that the primary source areas of windblown dust transported into Imperial County came from the mountain and desert slopes within San Diego County and Mexico where Imperial County has no jurisdiction. In any event, despite BACM in place within Imperial County, high winds overwhelmed all BACM controls where human activity played little to no direct causal role. The PM_{10} exceedance measured at the Calexico 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 west of Imperial County. These facts provide strong evidence that the PM_{10} exceedance at Calexico on September 21, 2017, was not reasonably controllable or preventable.

VI.3 Natural Event

The revised preamble to the EER clarifies that a "Natural Event" (50.1(k) of 40 CFR Part 50) is an event with its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. Anthropogenic sources that are reasonably controlled are considered not to play a direct role in causing emissions. As discussed within this demonstration, the PM_{10} exceedance that occurred at Calexico on September 21, 2017, was caused by the transport of windblown dust into Imperial County by strong gusty westerly winds associated with an unseasonably deep trough that passed through the region. At the time of the event, anthropogenic sources, within Imperial County were reasonably controlled with BACM. The event therefore qualifies as a natural event.

VI.4 Clear Causal Relationship

The comparative analysis of different meteorological sites to PM_{10} concentrations measured at the Calexico and other monitors in Imperial County demonstrates a consistency and correlation of strong gusty westerly winds with elevated concentrations of PM_{10} on September 21, 2017. In addition, temporal analysis indicates that the elevated PM_{10} concentrations and the gusty westerly winds were an event that was widespread, regional and not preventable. Days before the high wind

event PM_{10} concentrations were well below the NAAQS. Overall, the demonstration provides evidence of the strong correlation between the natural event and the transported windblown dust to the exceedance on September 21, 2017.

VI.5 Concentration to Concentration Analysis

The historical annual and seasonal 24-hr average PM_{10} measured concentrations at the Calexico 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 cold front associated with the unseasonably deep trough as it passed through the southern region of California. The information provides a clear causal relationship between the entrained windblown dust and the PM_{10} exceedance measured at the Calexico monitor on September 21, 2017.

In particular, the clear causal relationship and not reasonably controllable or preventable sections provide evidence that high gusty westerly winds transported fugitive emissions from open natural Mountain and desert areas, located within the San Diego County, Mexico 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.[24]

[24] 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.