# IMPERIAL COUNTY
# AIR POLLUTION CONTROL DISTRICT

Armchair Hiker San Diego: https://mountain-man-60.blogspot.com/p/anza-borrego.html

# February 11, 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 Calexico monitor in Calexico, California on February 11, 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<br>TITLE 40 CFR §50.14(c)(3)(iv) CHECKLIST<br>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. 25 |
| 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. 35 |
| 4 | A demonstration that the event was both not reasonably controllable and not reasonably preventable | Pg. 38 |
| 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. 45 |

[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<br>PROCEDURAL CHECKLIST<br>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 February 11, 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 February 9, 2018 the ICAPCD published a weekend advisory concerning the potential for elevated concentrations of particulate matter caused by strong offshore winds with the strongest winds occurring Sunday, February 11, 2018 following an active shortwave. The notice advised the public that by mid-day Sunday, February 11, 2018 offshore winds would begin to decrease however a new shortwave following a cutoff low just off the coast would affect the region on Monday. **Appendix C** contains copies of notices pertinent to the February 11, 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 February 11, 2018, a naturally occurring event elevated particulate matter within San Diego, Riverside and Imperial Counties, causing an exceedance at the Calexico monitor (06-025-0005). 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 February 11, 2018. After review, CARB submitted the INPEE, for the February 11, 2018 event in July of 2019. The submitted request included a brief description of the meteorological conditions for February 11, 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 February 11, 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 concentration of 172 $\mu g/m^3$ measured by the Calexico monitor on February 11, 2018.

**(B)** Concurrently with the Public Review period for the February 11, 2018 exceptional event, the ICAPCD is formally submitting to CARB for remittance to USEPA the Draft February 11, 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**

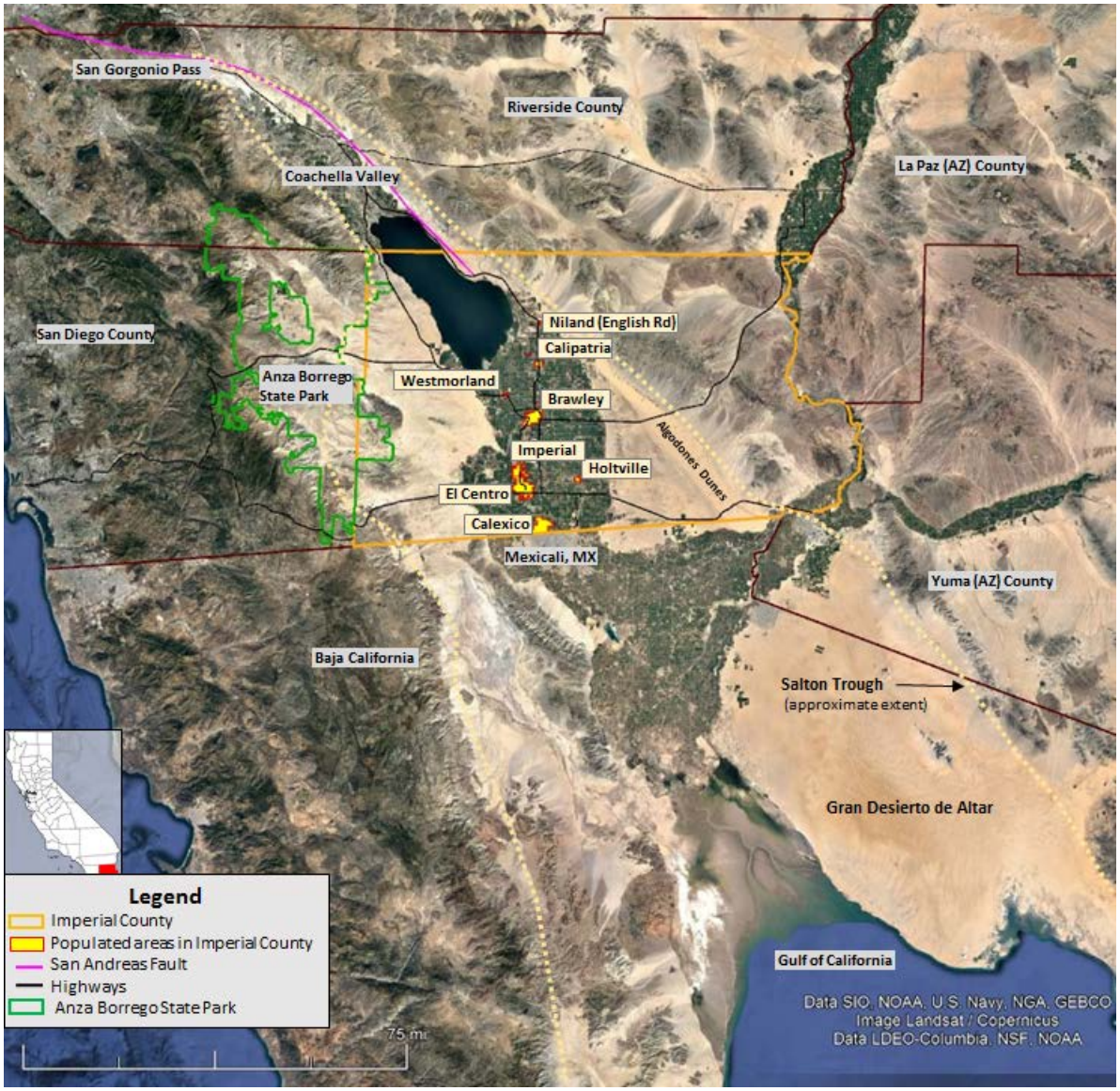



**Fig 1-1**: Imperial County a Southern California border region, within far southeast California bordering Arizona and Mexico has a small economically diverse region with a population of 174,528

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 monitor

## II.1 Description of the event causing the exceedance

Days before the February 11, 2018 both National Weather Service (NWS) office were tracking a low-pressure shortwave and trailing dry cold front that was moving into the interior West. Both NWS offices forecasted that the energy from the shortwave would boost winds throughout the region Saturday afternoon through the evening.[4] During the evening hours of Saturday, February 10, 2018 winds shifted offshore (northeast) and strengthened behind the shortwave.[5] That enhanced the post frontal pressure gradient developing stronger winds throughout western Arizona and Southeastern California during the evening hours of Saturday, February 10, 2018 into the morning hours of Sunday, February 11, 2018.[6]

Along with the low-pressure shortwave a dry cold front, oriented east to west began exiting the Great Basin entering southern Nevada and far northern Arizona on Saturday, February 10, 2018.[7] As the front pushed southward very strong northerly winds occurred into the morning hours of Sunday, February 11, 2018. As the low-pressure shortwave moved southwestward into southern California, the dry cold front pushed down through the Lower Colorado River Valley remaining stagnant and eventually diminishing.[8] Winds reduced for a brief time during the mid-day hours of February 11, 2018 only to increase as another deep but compact upper level low off the coast of southern British Columbia moved into northern California.[9] This system was followed by a second shortwave trough affecting the region during the evening hours of February 11, 2018 through Monday, February 12, 2018.[10] The introduction of the new system sufficiently affected wind speeds and direction to allow some southwesterly influence during the evening hours of February 11, 2018.[11] As the winds increase within the San Diego Mountains and deserts winds within Imperial County remained lower. However, the suspended dust from the morning winds allowed for the deposition of dust onto the Calexico monitor. As the winds shifted from a northerly direction to a southwest direction, suspended dust shifted back and forth

[4] National Weather Service, Area Forecast Discussion, Feb. 9, 2018, San Diego office, 236am PST
[5] National Weather Service, Area Forecast Discussion, Feb. 9, 2018 to Feb., 10, 2018, San Diego office,1209pm PST & 845pm PST
[6] National Weather Service, Area Forecast Discussion, Feb. 9, 2018, Phoenix office, 0300am MST & 305pm MST
[7] National Weather Service, Area Forecast Discussion, Feb. 10, 2018, Phoenix office, 945pm MST
[8] National Weather Service, Area Forecast Discussion, Feb. 11, 2018, Phoenix office, 304am MST
[9] National Weather Service, Area Forecast Discussion, Feb. 11, 2018, Phoenix office 304am MST
[10] *Id.*
[11] National Weather Service, Area Forecast Discussion, Feb. 11, 2018, San Diego office, 311am PST & 807am PST; Phoenix office 304am MST

from Calexico and Mexico, allowing for measured elevated concentrations during the evening hours of February 11, 2018.[12]

In anticipation of the strong gusty northerly winds, the Phoenix NWS office issued four (4) Urgent Weather Messages advising the public of advisory level north winds 20 to 30 mph with gust to 45 mph. In fact, both NWS office began amending their aviation reports, starting February 10, 2018, identifying the gusty northeast to east winds with surface gusts above 34 mph.[13] Overall, the wind event that occurred on February 11, 2018 was affected by two systems. The first, a low-pressure shortwave with a trailing dry cold front that generated gusty northerly winds during the morning hours of February 11, 2018. The second system, described as a deep but compact upper level low, quickly moved south reaching northern California during the evening hours, of February 11, 2018 allowing for some southwesterly influence into the region affecting southeastern California.[14] **Appendix A** contains all pertinent NWS notices.

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

On February 11, 2018, the air monitors in Imperial, Riverside and Yuma counties measured elevated concentrations of particulate matter when two different systems affected winds. The first system, a forecasted low-pressure shortwave with a trailing dry cold front brought strong northeasterly winds during the morning hours of February 11, 2018. Although the wind speeds reduced as the system diminished during the mid-day hours, shifting wind patterns influenced by a second system produced moderate gusty westerly winds during the evening hours across southeastern California. The first system with an associated dry cold front generated emissions from within the open natural desert areas within Riverside County and Arizona during the morning hours of February 11, 2018. During the evening hours, of February 11, 2018, a second system generated emissions from within the natural open mountains and desert areas within northern Mexico, specifically across Mexicali and the Laguna Salada. Although winds lowered during the evening hours, suspended particulates continued within the extreme southeastern region, including Imperial County, northern Mexico and Yuma Arizona. The shift between systems caused a stagnant and slow shifting of suspended particulates between Mexico and Imperial County as lower winds allowed for deposition of particulates onto the Calexico monitor. These windblown dust emissions were transported to all the regional air quality monitors. Only the most southern monitors were significantly affected by the evening emissions causing an exceedance of the $PM_{10}$ NAAQS at the Calexico monitor (**Table 2-**

[12] National Weather Service, Area Forecast Discussion, Feb. 11, 2018, San Diego office, 123pm PST
[13] National Weather Service, Urgent Weather Message, Feb. 10, 2018 to Feb., 11, 2017, Phoenix office, 340am MST; 123pm MST; 158am MST; 800am MST
[14] National Weather Service, Area Forecast Discussion, Feb. 11, 2018, Phoenix office, 304am MST

**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 the Laguna Salada in Mexico, and the site furthest north is the Needles Airport (KEED) near the Nevada border

# 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PS FIRE STATION | 20180210 | 12 | 13 | 17 | 20 | 21 | 15 | 14 | 18 | 24 | 30 | 26 | 21 | 49 | 48 | 32 | 41 | 43 | 49 | 42 | 32 | 31 | 41 | 80 | 99 | 99 | 34 |
| | **20180211** | 117 | 146 | 156 | 160 | 143 | 117 | 108 | 78 | 54 | 50 | 46 | 45 | 47 | 46 | 42 | 42 | 48 | 53 | 54 | 57 | 83 | 71 | 62 | 55 | **160** | 78 |
| | 20180212 | 58 | 61 | 55 | 53 | 49 | 43 | 42 | 41 | 41 | 39 | 29 | 27 | 30 | 28 | 26 | 21 | 19 | 17 | 19 | 14 | 11 | 11 | 7 | 8 | 61 | 31 |
| INDIO | 20180210 | 34 | 23 | 33 | 31 | 29 | 28 | 38 | 37 | 33 | 21 | 20 | 19 | 49 | 41 | 43 | 50 | 83 | 152 | 152 | 111 | 45 | 38 | 59 | 84 | 152 | 52 |
| | **20180211** | 161 | 407 | 182 | 161 | 154 | 146 | 128 | 128 | 106 | 77 | 57 | 55 | 59 | 100 | 55 | 62 | 61 | 65 | 77 | 68 | 64 | 67 | 88 | 67 | **407** | 108 |
| | 20180212 | 61 | 55 | 46 | 48 | 47 | 45 | 48 | 70 | 48 | 33 | 25 | 63 | 158 | 166 | 187 | 72 | 38 | 28 | 24 | 23 | 19 | 16 | 16 | 11 | 187 | 56 |
| MECCA | 20180210 | 39 | 30 | 28 | 24 | 30 | 19 | 39 | 87 | 35 | 18 | 20 | 13 | 10 | 18 | 39 | 57 | 53 | 95 | 91 | 168 | 86 | 61 | 53 | 155 | 168 | 52 |
| | **20180211** | 1158 | 1128 | 391 | 217 | 146 | 150 | 129 | 121 | 106 | 95 | 64 | 75 | 57 | 72 | 55 | 60 | 72 | 83 | 60 | 59 | 71 | 74 | 80 | 82 | **1158** | 191 |
| | 20180212 | 54 | 59 | 49 | 50 | 37 | 40 | 52 | 54 | 31 | 20 | 14 | 39 | 44 | 86 | 283 | 270 | 78 | 52 | 41 | 34 | 26 | 25 | 13 | 14 | 283 | 61 |
| TORRES MARTINEZ | 20180210 | 15 | 13 | 18 | 14 | 17 | 28 | 46 | 66 | 34 | 17 | 15 | 21 | 15 | 29 | 40 | 83 | 77 | 34 | 93 | 71 | 57 | 82 | 121 | 91 | 121 | 45 |
| | **20180211** | 820 | 963 | 448 | 168 | 158 | 164 | 128 | 127 | 122 | 100 | 74 | 64 | 85 | 56 | 52 | 51 | 57 | 91 | 53 | 54 | 58 | 64 | 70 | 70 | **963** | 170 |
| | 20180212 | 70 | 62 | 53 | 55 | 53 | 43 | 57 | 54 | 48 | 26 | 36 | 425 | 1242 | 2283 | 2542 | 1420 | 203 | 149 | 40 | 92 | 53 | 29 | 15 | 11 | 2542 | 377 |
| NILAND | 20180210 | 40 | 31 | 30 | 20 | 24 | 26 | 23 | 23 | 15 | 30 | 20 | 29 | 32 | 40 | 37 | 32 | 21 | 16 | 14 | 21 | 58 | 64 | 60 | 378 | 378 | 45 |
| | **20180211** | 365 | 326 | 313 | 353 | 170 | 155 | 123 | 103 | 91 | 89 | 69 | 71 | 62 | 65 | 65 | 65 | 60 | 63 | 69 | 116 | 83 | 71 | 64 | 62 | **365** | 128 |
| | 20180212 | 51 | 34 | 35 | 32 | 61 | 97 | 98 | 78 | 75 | 130 | 51 | 20 | 53 | 54 | 173 | 83 | 59 | 66 | 29 | 21 | 25 | 16 | 13 | 9 | 173 | 56 |
| WESTMORLAND | 20180210 | 23 | 31 | 43 | 29 | 22 | 13 | 10 | 28 | 35 | 30 | 36 | 35 | 28 | 33 | 39 | 18 | 31 | 29 | 51 | 61 | 40 | 45 | 53 | 284 | 284 | 43 |
| | **20180211** | 479 | 309 | 253 | 234 | 268 | 141 | 114 | 124 | 116 | 91 | 103 | 65 | 64 | 74 | 70 | 65 | 70 | 67 | 66 | 72 | 70 | 51 | 46 | 28 | **479** | 126 |
| | 20180212 | 18 | 40 | 43 | 26 | 11 | 88 | 93 | 50 | 284 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 284 | 27 |
| BRAWLEY | 20180210 | 49 | 43 | 30 | 23 | 13 | 16 | 15 | 28 | 31 | 42 | 48 | 33 | 33 | 29 | 49 | 37 | 54 | 66 | 63 | 37 | 42 | 46 | 56 | 97 | 97 | 40 |
| | **20180211** | 825 | 400 | 269 | 282 | 302 | 158 | 112 | 109 | 115 | 99 | 86 | 66 | 69 | 64 | 70 | 71 | 66 | 92 | 85 | 83 | 75 | 103 | 27 | 27 | **825** | 152 |
| | 20180212 | 30 | 64 | 69 | 56 | 94 | 97 | 97 | 102 | 92 | 133 | 144 | 73 | 96 | 204 | 334 | 184 | 123 | 123 | 62 | 231 | 281 | 109 | 65 | 11 | 334 | 119 |
| EL CENTRO | 20180210 | 35 | 87 | 41 | 24 | 21 | 20 | 24 | 30 | 46 | 46 | 54 | 34 | 38 | 76 | 103 | 101 | 96 | 70 | 46 | 43 | 31 | 29 | 20 | 34 | 103 | 47 |
| | **20180211** | 116 | 504 | 282 | 264 | 239 | 253 | 223 | 192 | 160 | 131 | 109 | 93 | 80 | 75 | 74 | 80 | 77 | 80 | 91 | 109 | 104 | 92 | 67 | 56 | **504** | 147 |
| | 20180212 | 91 | 112 | 114 | 129 | 112 | 109 | 153 | 136 | | 50 | 43 | 31 | 26 | 89 | 118 | 100 | 69 | 34 | 32 | 25 | 21 | 22 | 19 | 17 | 153 | 71 |
| CALEXICO | 20180210 | 210 | 101 | 64 | 32 | 20 | 28 | 30 | 41 | 49 | 61 | 56 | 46 | 50 | 63 | 61 | 65 | 71 | 78 | 88 | 161 | 35 | 24 | 24 | 27 | 210 | 61 |
| | **20180211** | 42 | 602 | 295 | 260 | 262 | 274 | 249 | 196 | 169 | 134 | 116 | 92 | 86 | 71 | 55 | 59 | 56 | 66 | 111 | 100 | 155 | 237 | 224 | 228 | **602** | 172 |
| | 20180212 | 251 | 250 | 191 | 158 | 122 | 97 | 114 | 146 | 154 | 128 | 83 | 37 | 23 | 47 | 137 | 203 | 164 | 50 | 34 | 27 | 26 | 19 | 21 | 24 | 251 | 104 |
| YUMA SUPERSITE (PST) | 20180210 | 11 | 9 | 14 | 52 | 124 | 44 | 119 | 124 | 23 | 33 | 30 | 31 | 24 | 19 | 17 | 18 | 33 | 35 | 30 | 23 | 23 | 30 | 33 | 30 | 124 | 38 |
| | **20180211** | 33 | 749 | 545 | 571 | 274 | 201 | 167 | 188 | 172 | 150 | 97 | 83 | 74 | 68 | 59 | 57 | 58 | 74 | 75 | 80 | 113 | 127 | 124 | 128 | **749** | 177 |
| | 20180212 | 102 | 83 | 103 | 96 | 86 | 94 | 78 | 52 | 42 | 41 | 41 | 39 | 57 | | 72 | 36 | 29 | 128 | 63 | 44 | 31 | 28 | 23 | 47 | 128 | 61 |
| YUMA SUPERSITE (MST) | 20180209 | 53 | 20 | 22 | 19 | 22 | 67 | 84 | 180 | 91 | 121 | 48 | 64 | 24 | 29 | 18 | 18 | 12 | 16 | 67 | 77 | 85 | 84 | 35 | 9 | 180 | 52 |
| | 20180210 | 12 | 11 | 9 | 14 | 52 | 124 | 44 | 119 | 124 | 23 | 33 | 30 | 31 | 24 | 19 | 17 | 18 | 33 | 35 | 30 | 23 | 23 | 30 | 33 | 124 | 37 |
| | **20180211** | 30 | 33 | 749 | 545 | 571 | 274 | 201 | 167 | 188 | 172 | 150 | 97 | 83 | 74 | 68 | 59 | 57 | 58 | 74 | 75 | 80 | 113 | 127 | 124 | **749** | 173 |
| | 20180212 | 128 | 102 | 83 | 103 | 96 | 86 | 94 | 78 | 52 | 42 | 41 | 41 | 39 | 57 | | 72 | 36 | 29 | 128 | 63 | 44 | 31 | 28 | 23 | 128 | 65 |
| | 20180213 | 47 | 50 | 45 | 36 | 29 | 24 | 33 | 92 | 62 | 85 | 64 | 28 | 51 | 24 | 30 | 24 | 20 | 28 | 38 | 45 | 56 | 58 | 52 | 47 | 92 | 44 |

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**

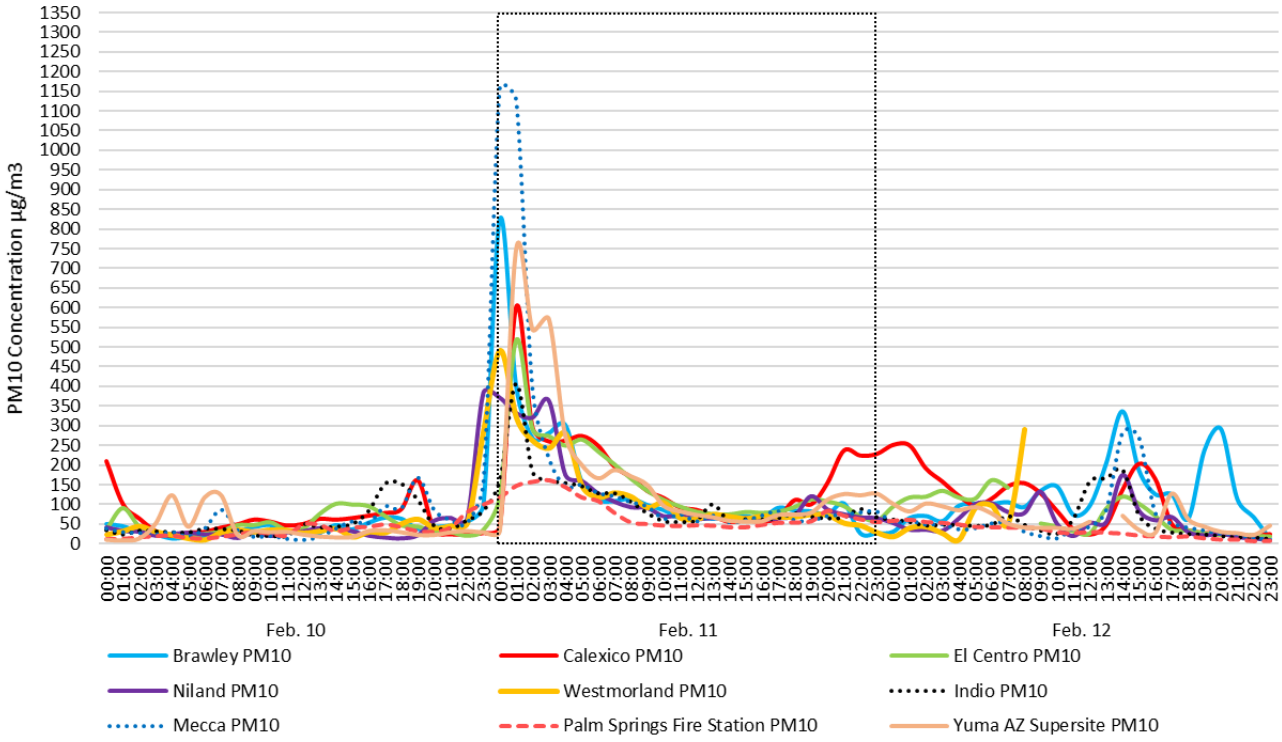



**Fig 2-2**: is a three-day graphical representation of the $PM_{10}$ concentrations measured at the sites identified in **Table 2-1**. Note sites located to the east or to the south measured higher 24-hour averaged concentrations compared to sites located to the west

Wind speed, wind direction and the airflow patterns combined all help explain how windblown emissions resulting from the strong NNE Santa Ana winds followed by the gusty WSW affected the Calexico monitor on Friday, February 11, 2018.

As mentioned above, both NWS office, San Diego and Phoenix, kept track of a shortwave low pressure and associated dry cold front. The system increased the pressure gradient and produce strong northeasterly winds within southeastern California by Sunday, February 11, 2018. As mentioned above, four (4) Urgent Weather Messages were issued by the NWS office in Phoenix advising of advisory level northerly winds within Riverside, Arizona 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 eastern Riverside and San Bernardino counties that were directly upwind measured wind speeds at or above 25 mph along with wind gusts at or above 25 mph, all coincident with measured elevated concentrations.

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

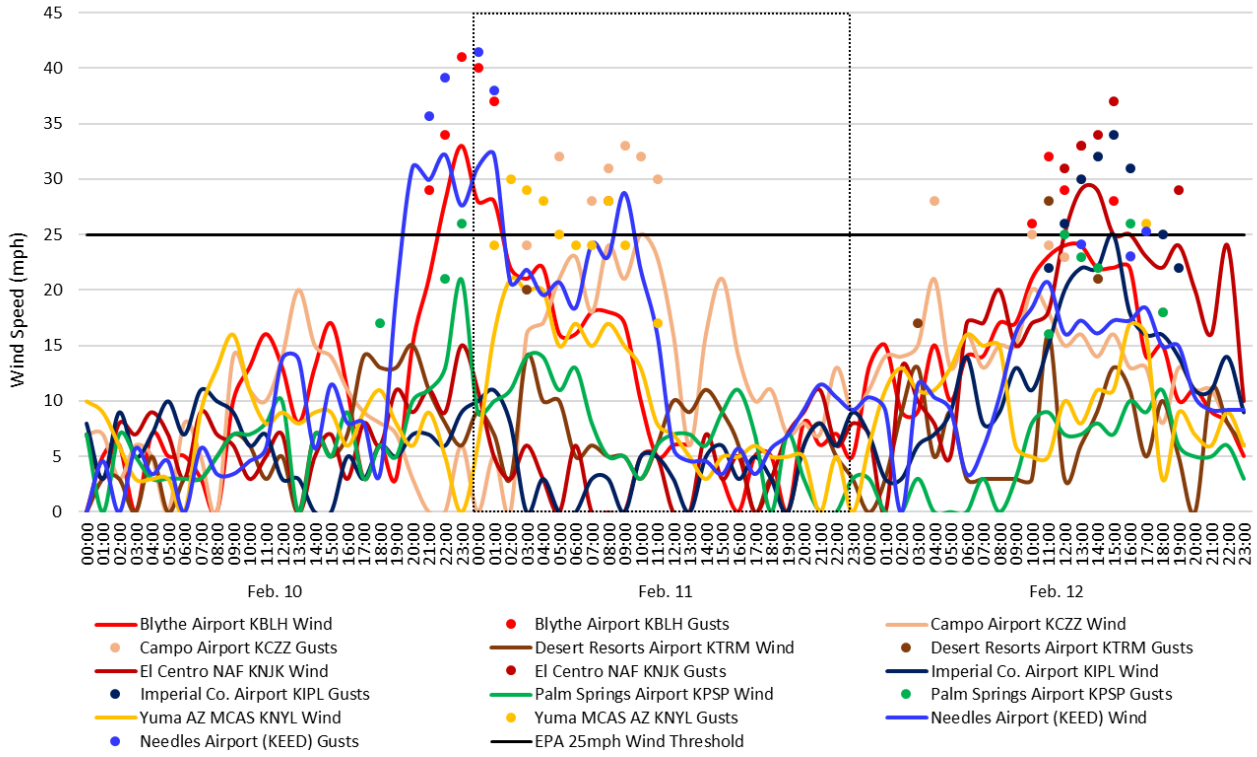



**Fig 2-3**: is a three-day graphical representation of the measured wind speed and wind gust (if available) from local and neighboring airports. Note that the northerly airports at Blythe and Needles measured strong winds and gusts, while airports further south in Imperial County measured much more modest winds. 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 GUST UPSTREAM SITES**

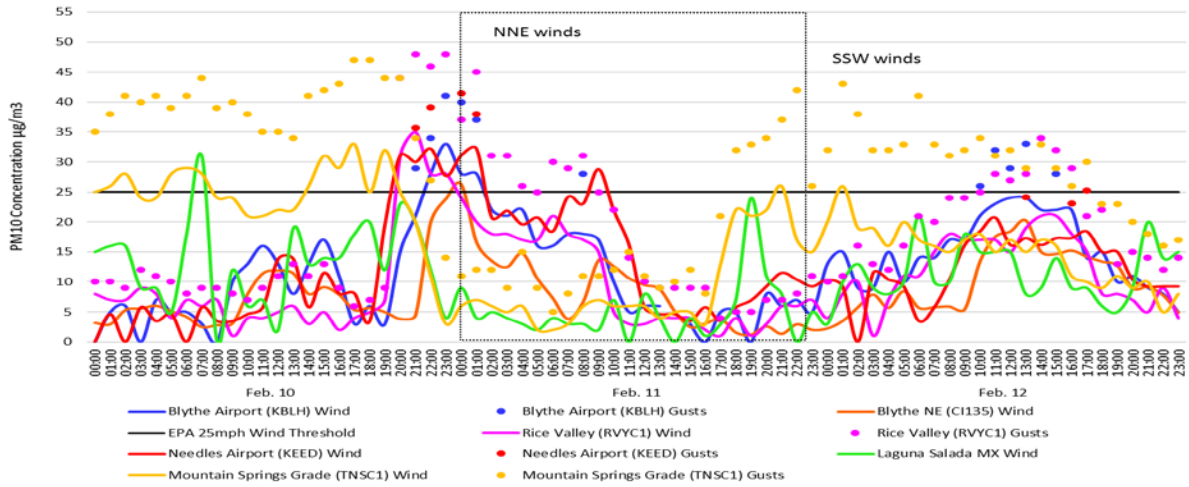



**Fig 2-4**: is a three-day graphical representation of the measured wind speed and wind gust (if available) from sites located upwind from the Calexico monitor. The break between the two systems is evident as the winds speeds quickly diminish. All data derived from the University of Utah's Meso West https://mesowest.utah.edu/index.html

The National Oceanic and Atmospheric Administration (NOAA) Laboratory HYSPLIT back-trajectory HYSPLIT models[15] provide supporting evidence of the northeasterly airflow within Imperial County on February 11, 2018 during the morning hours and the westerly airflow during the evening hours. As an all-day event, the HYSPLIT back-trajectory models in **Figures 2-5 through 2-13** depict the airflow during the morning (0100 PST), mid-morning (1000 PST), late afternoon (1800 PST) through the evening (2300 PST) and dawn hours (0200 PST) on February 12, 2018 to help illustrate the break between the two systems, along with the shift of airflow from a northeasterly direction, to a westerly direction.

**Figures 2-5 and 2-6** depict the airflow from a northeasterly direction coincident with elevated concentrations above 100 µg/m$^3$ at all air quality monitors in Imperial County. **Figures 2-7 through 2-13** help illustrate the late afternoon to evening airflow as the second system enters northern California affecting airflow in Imperial County from a northeasterly flow to a westerly flow. By the early morning hours of February 12, 2018, westerly airflow dominates.

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

The measured winds at the Laguna Salada (24 mph) and the Mountain Springs Grade (26 mph) sites (**Table 3-2**) do appear east of the HYSPLITS, but we recognize that there is a lack of met data in the area and HYSPLITS are not exact paths. In any event, these HYSPLITS do indicate transport over the Laguna Salada providing for the possibility of re-entrained dust and additional medium/high winds in the evening looks like the best argument for $PM_{10}$ high wind.

**FIGURE 2-5**
**HYSPLIT MODEL All SITES FEBRUARY 11, 2018 0100 PST**

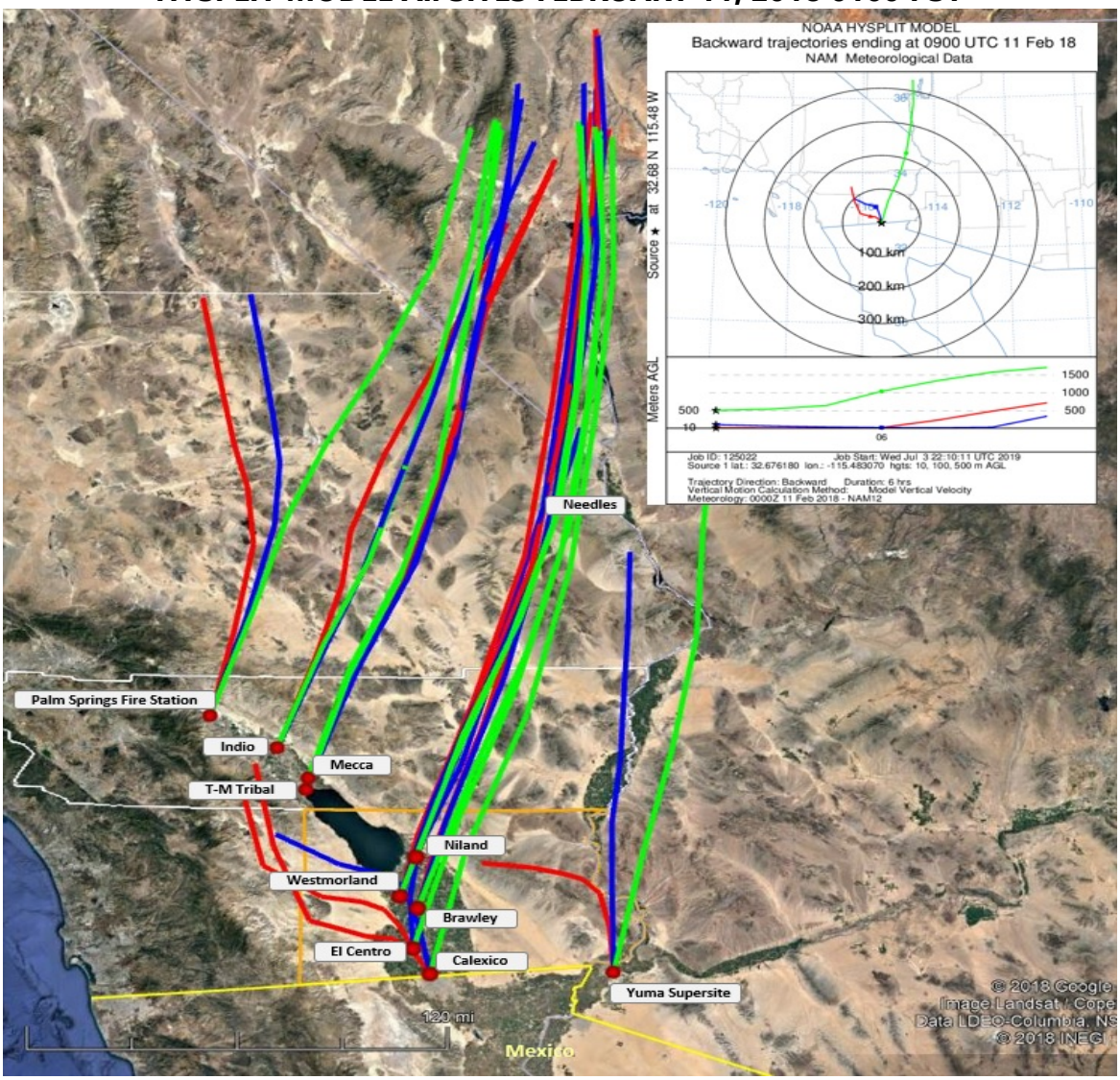



**Fig 2-5**: A 6-hour back-trajectory HYSPLIT ending at 0100 PST for all sites identified in **Table 2-1**. Note that airflow at all levels has shifted NNE, although a few monitors still show 10-meter airflow (red trajectories) shifting from the west to the north. The inset graphic depicts the airflow to the Calexico monitor. 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 FEBRUARY 11, 2018 1000 PST**

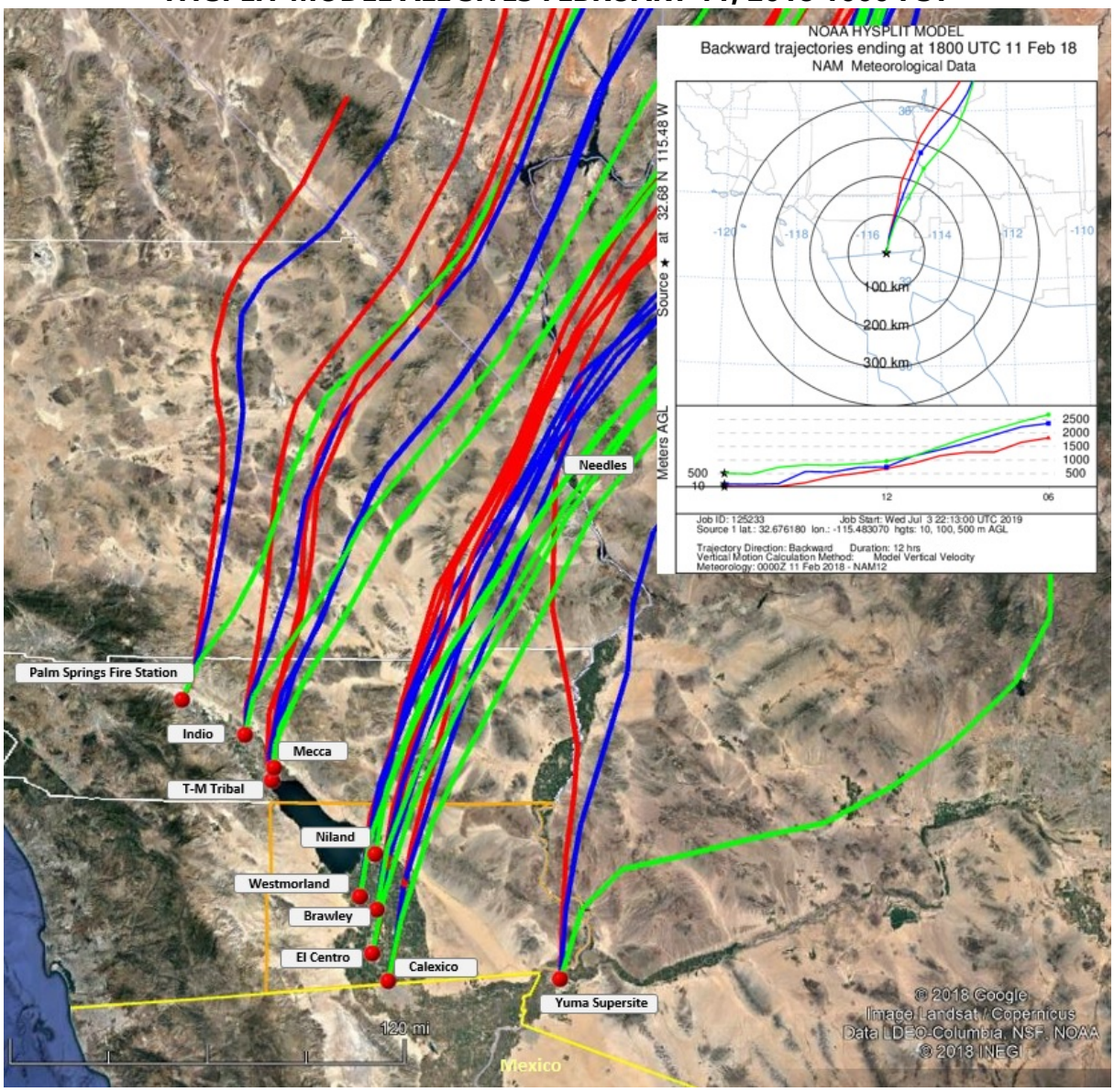



**Fig 2-6**: A 12-hour back-trajectory HYSPLIT ending at 1000 PST for all sites. Note that the airflow is now solidly NNE at all monitors except at the Yuma site. The inset graphic depicts the airflow to the Calexico monitor. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue 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 FEBRUARY 11, 2018 1800 PST**

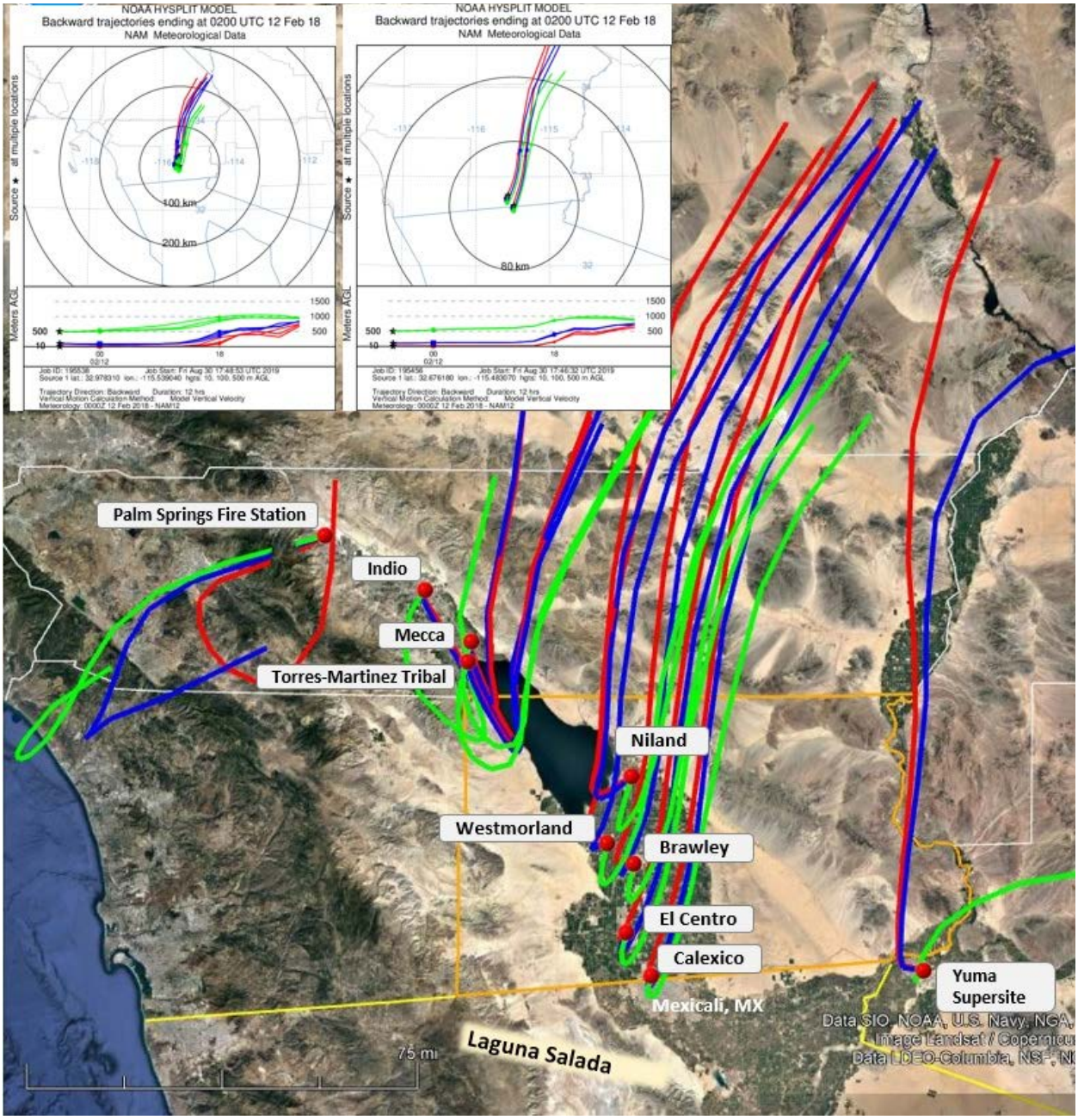



**Fig 2-7**: A 12-hour back-trajectory HYSPLIT ending at 1800 PST for all sites. Airflow is now shifting from NNE to SSW. Note the beginning of the southerly flow into Mexicali, Mexico at the Calexico monitor. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow 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 2-8**
**HYSPLIT MODEL ALL SITES FEBRUARY 11, 2018 1900 PST**

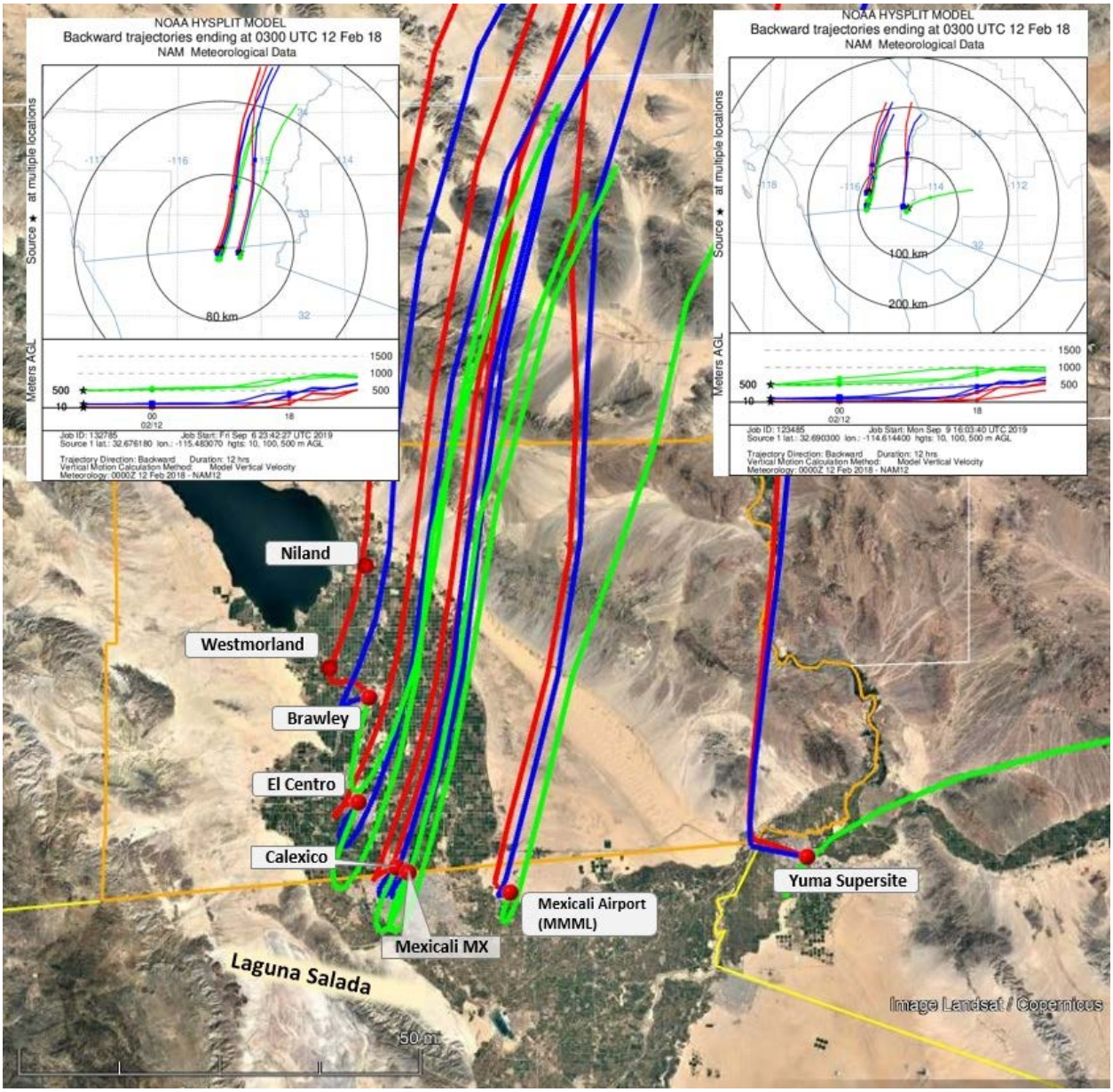



**Fig 2-8**: A 12-hour back-trajectory HYSPLIT ending at 1900 PST for sites located in Imperial County, Yuma and Mexicali, Mexico. Airflow continues to shift to the southwest. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

**FIGURE 2-9**
**HYSPLIT MODEL ALL SITES FEBRUARY 11, 2018 2000 PST**

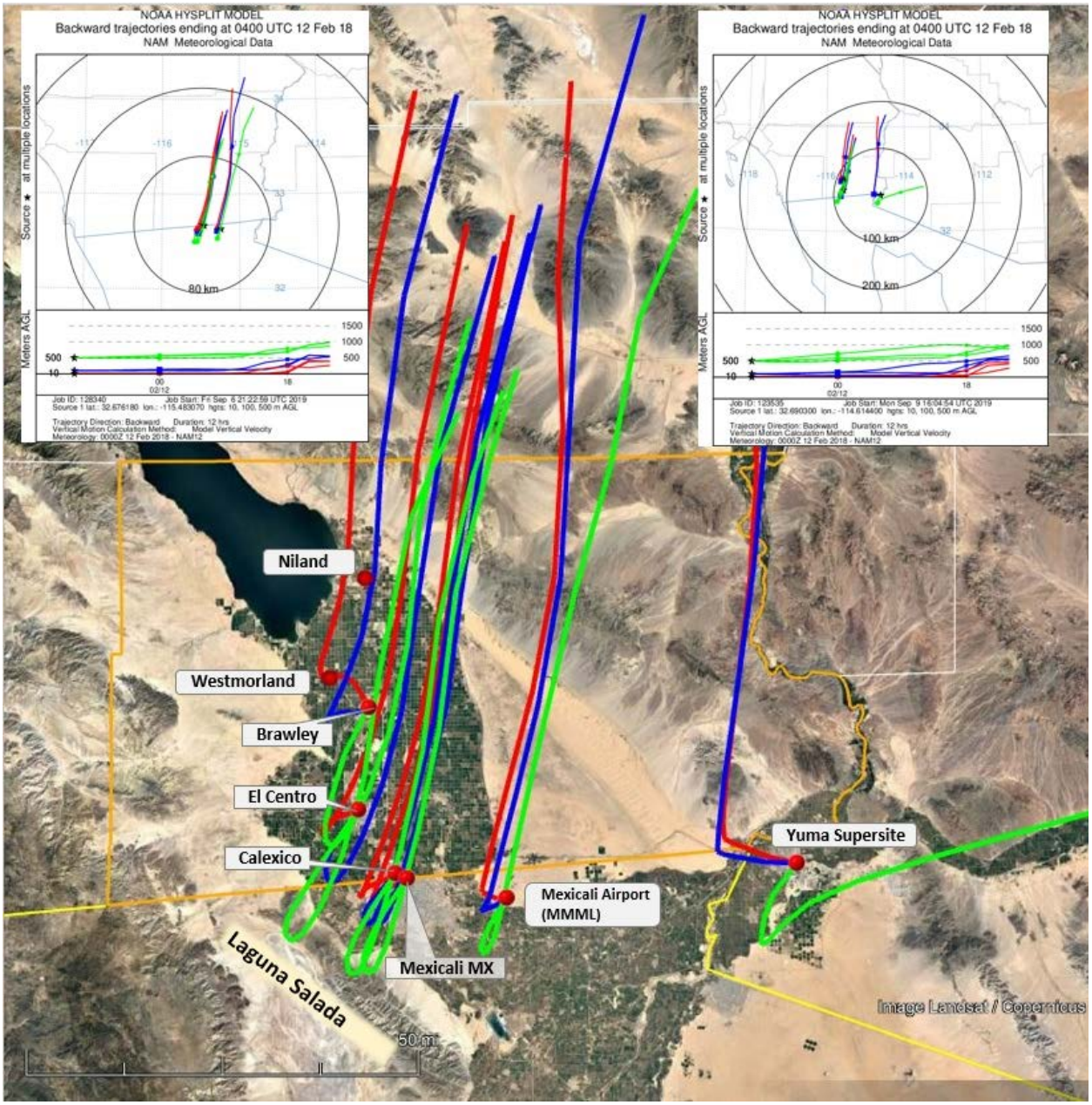



**Fig 2-9**: A 12-hour back-trajectory HYSPLIT ending at 2000 PST for sites located in Imperial County, Yuma and Mexicali, Mexico. Airflow continues to shift to the southwest. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

**FIGURE 2-10**
**HYSPLIT MODEL ALL SITES FEBRUARY 11, 2018 2100 PST**

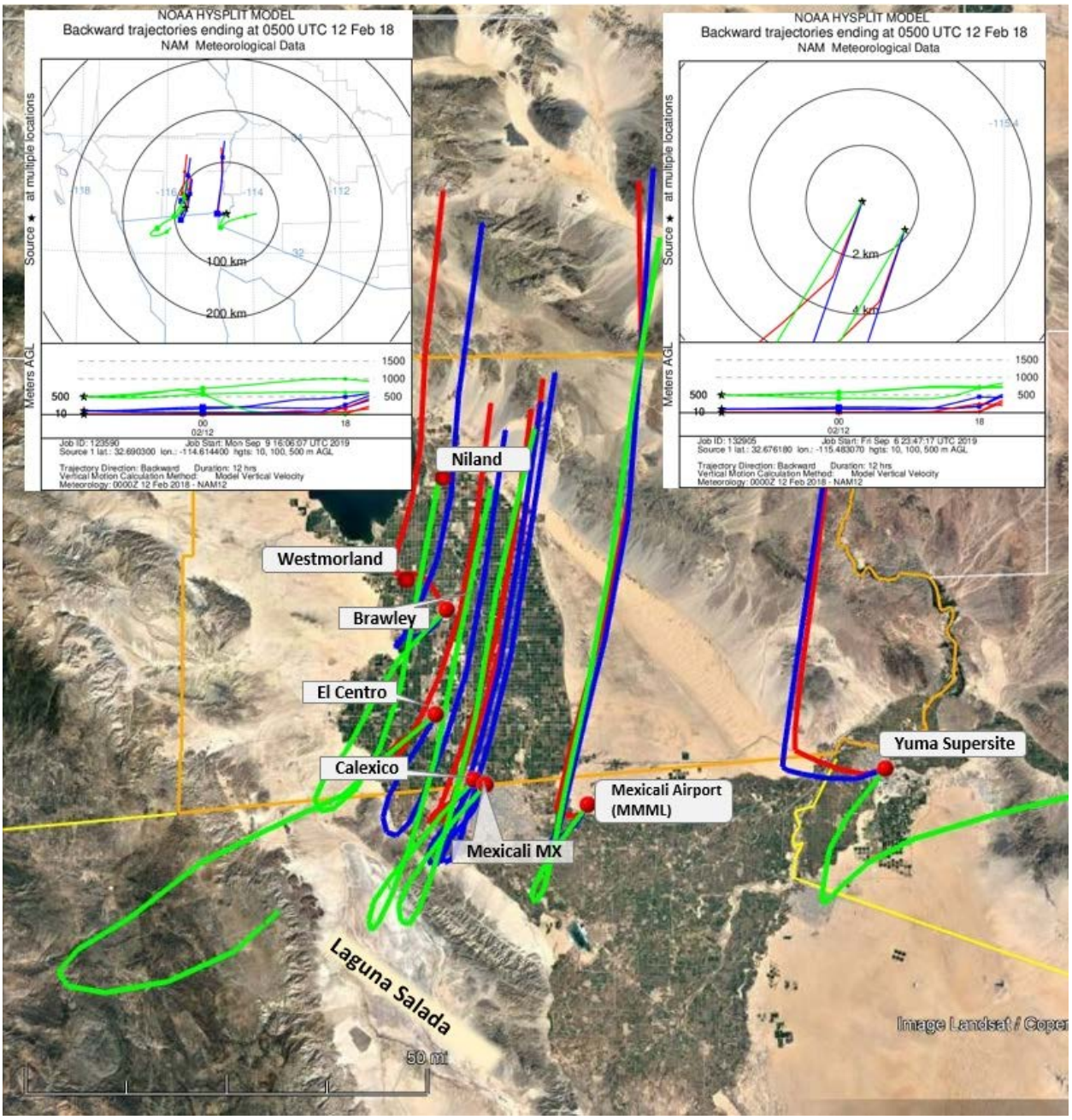



**Fig 2-10**: A 12-hour back-trajectory HYSPLIT ending at 2100 PST for sites located in Imperial County, Yuma and Mexicali, Mexico. Airflow continues to shift to the southwest. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

**FIGURE 2-11**
**HYSPLIT MODEL ALL SITES FEBRUARY 11, 2018 2200 PST**

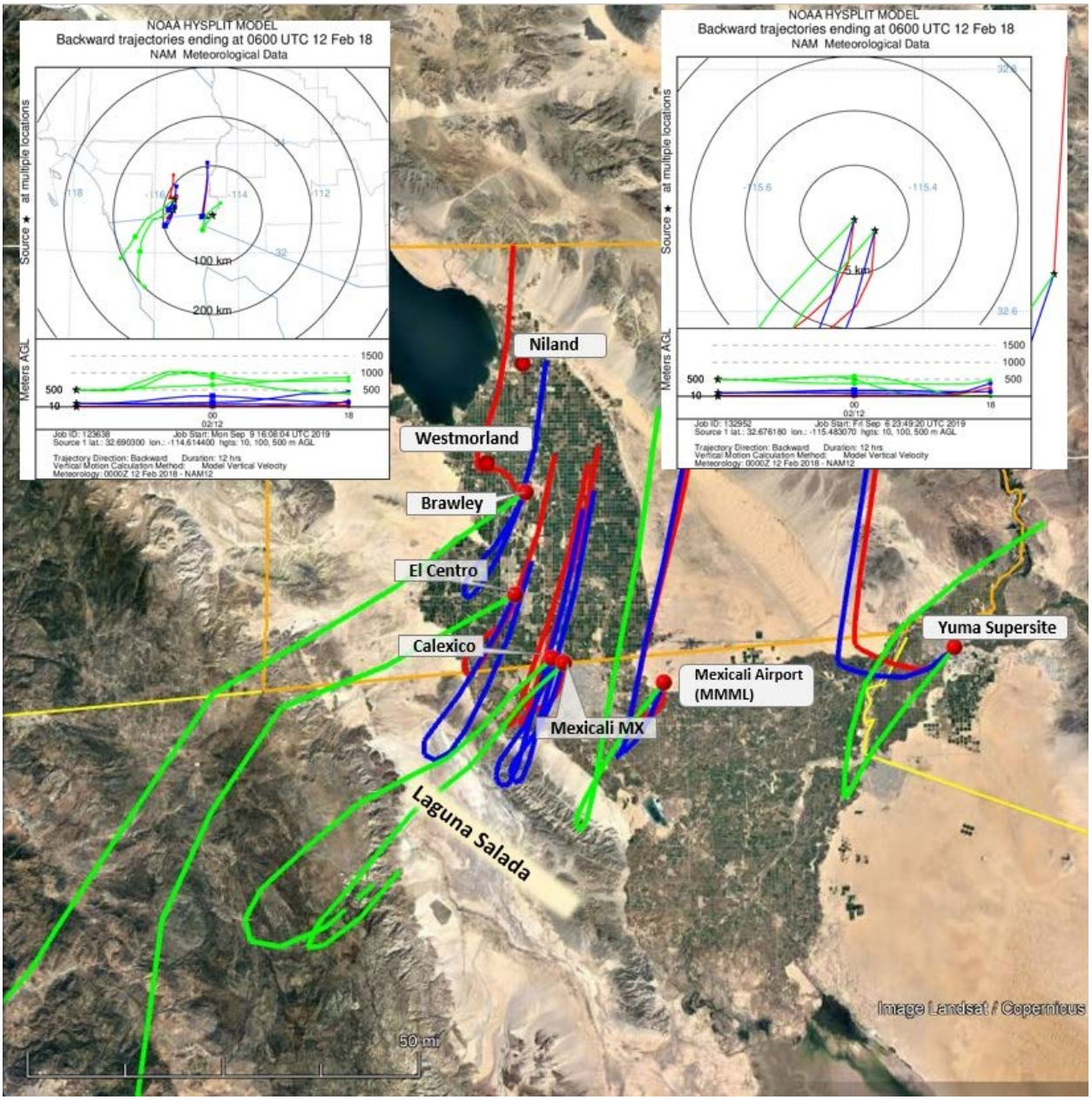



**Fig 2-11**: A 12-hour back-trajectory HYSPLIT ending at 2200 PST for sites located in Imperial County, Yuma and Mexicali, Mexico. Airflow continues to shift to the southwest. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

**FIGURE 2-12**
**HYSPLIT MODEL ALL SITES FEBRUARY 11, 2018 2300 PST**

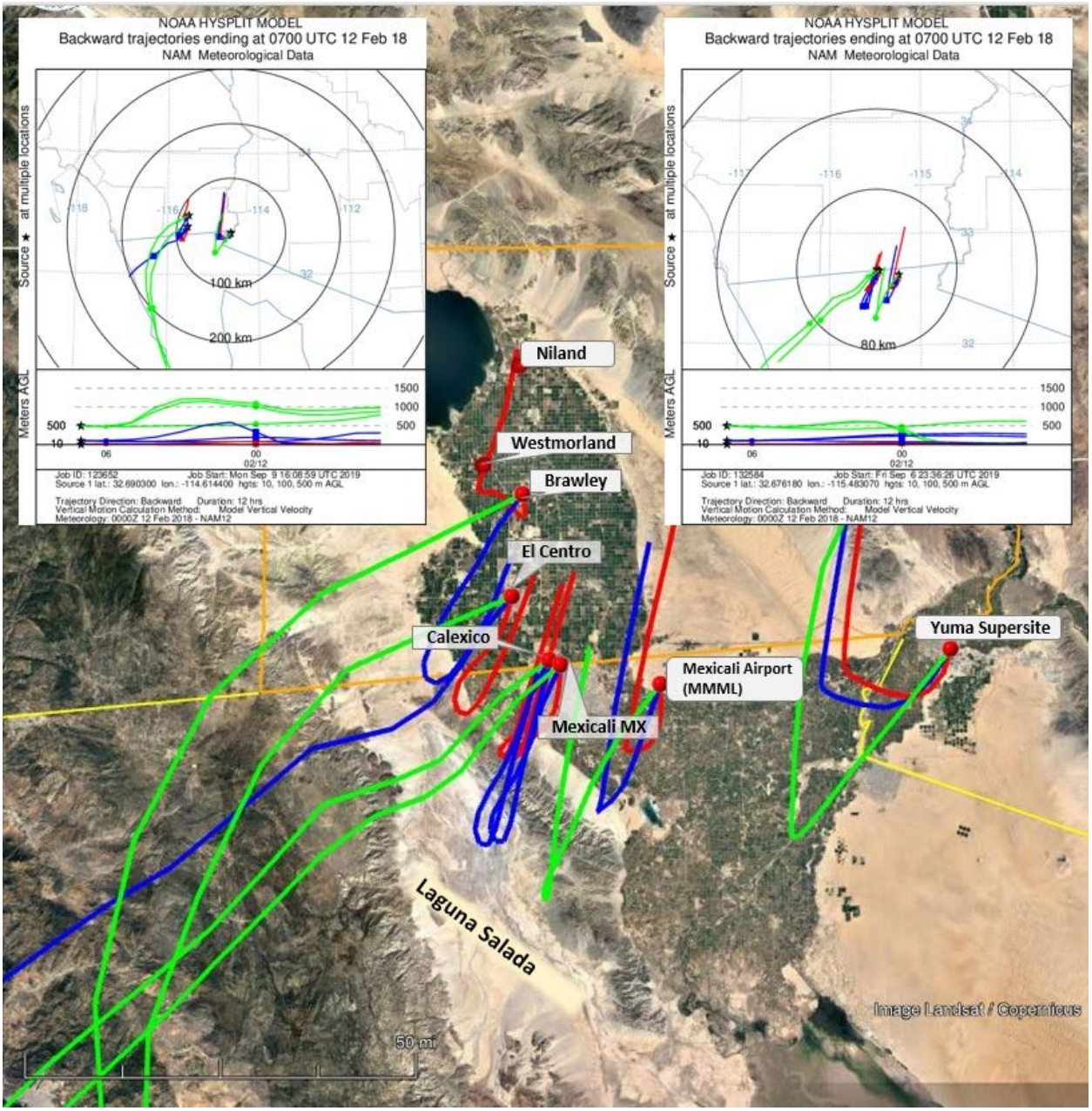



**Fig 2-12**: A 12-hour back-trajectory ending at 2300 PST for sites located in Imperial County, Yuma and Mexicali, Mexico. Shift of airflow is much more west, and southwest. Top inset northern Imperial County monitors. Bottom inset southern Imperial County monitors plus Yuma. Red trajectory indicates 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 2-13**
**HYSPLIT MODEL ALL SITES FEBRUARY 12, 2018 0200 PST**

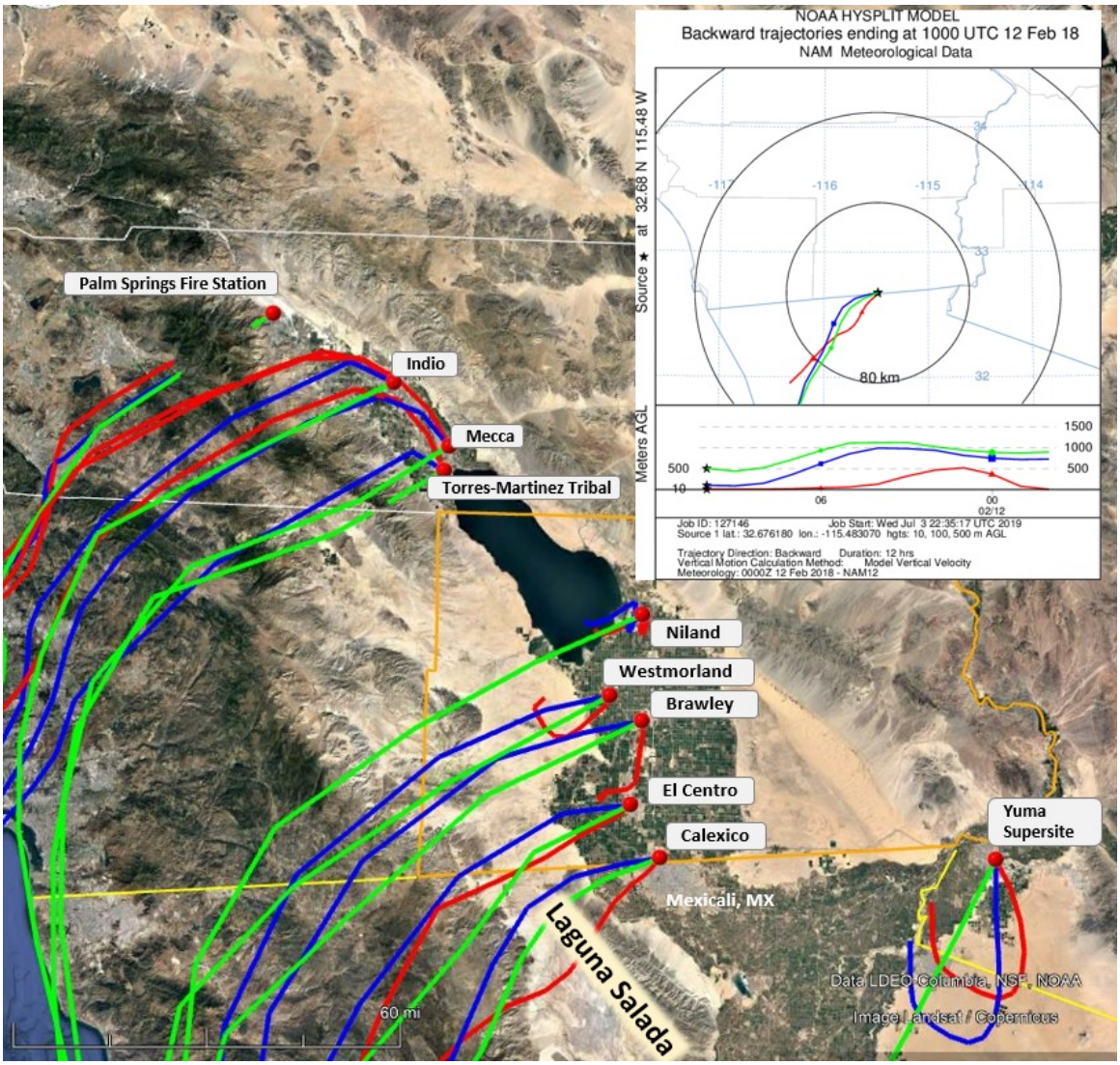



**Fig 2-13**: A 12-hour back-trajectory ending at 0200 PST on February 12, 2018 for all sites. Airflow is predominantly west. The inset graphic depicts the airflow to the Calexico monitor. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates 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 north northeast winds blew over open natural desert areas northeast of Imperial County during the morning hours, followed by gusty west southwest winds during the late afternoon to evening hours, fugitive windblown dust significantly affected all air quality monitors within Imperial County. Although neither Imperial County Airport (KIPL) nor the El Centro Naval Air Facility (KNJK) measured winds above 25 mph, the Needles Airport (KEED) and Blythe Airport (KBLH) both measured winds and gusts above 25 mph during the evening hours of February 10, 2018 through the early morning hours of February 11, 2018. Both of these airports are upwind from 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, the February 11, 2018 event was affected by two weather systems. The first, a low-pressure shortwave with a trailing dry cold front moved into the interior West generating winds throughout the region Saturday afternoon through the evening.[16] As the shortwave moved southeast over the Great Basin sending the winds back offshore creating northerly winds, the dry cold front which was oriented east to west began exiting the Great Basin and entered southern Nevada and far northern Arizona on Saturday, February 10, 2018.[17] As the front pushed southward very strong northerly winds blew from Riverside County and Arizona into Imperial County during the morning hours of Sunday, February 11, 2018. As the low-pressure shortwave moved further southwestward into southern California, the dry cold front pushed down through the Lower Colorado River Valley remaining stagnant and eventually diminishing.[18]

As the cold front diminished winds similarly diminished, however a second shortwave trough quickly moved south reaching northern California during the evening hours, of February 11, 2018 allowing for some southwesterly influence. By the afternoon of February 11, 2018, gusty southwesterly winds, blowing within the San Diego Mountains, were slowly pushing the departing morning system and the northerly airflow slowly changed to a southwest airflow between the 1800 to 2300 hours.[19] This caused currently suspended dust emissions from the morning event to swish back and forth between the Mexico and the United States border. Both the Calexico monitor and the Yuma monitor experienced the same effect and measured relatively the same hourly concentrations above 100 µg/m$^3$. A comparison of the $PM_{10}$ and $PM_{2.5}$ concentrations, that were available for February 10, 2018 through February 12, 2018 demonstrate a parallel indicating the level of suspended particulates present in the atmosphere (**Figure 3-1**). Compare these emissions to a day when cultural celebrations occur in Mexico, where fireworks and other fuel burning activities dominate the City of Mexicali (**Figure 3-2**). It is not uncommon in Mexico during seasonal cultural holiday celebrations for there to be a significant amount of burning. These cultural holiday celebrations occur in and around December 25$^{th}$ and January 1$^{st}$ (New Year's) each year. Comparing emissions resulting from the celebratory day for the New Year to the emissions from the wind event on February 11, 2018, one can see a significant difference in pattern and concentrations. In addition, no known burning either in Mexico or the United States was reported on February 11, 2018.

[16] National Weather Service, Area Forecast Discussion, Feb. 9, 2018, San Diego office, 236am PST
[17] National Weather Service, Area Forecast Discussion, Feb. 10, 2018, San Diego office, 110pm PST & Phoenix office, 945pm MST
[18] National Weather Service, Area Forecast Discussion, Feb. 11, 2018, Phoenix office, 304am MST
[19] National Weather Service, Area Forecast Discussion, Feb. 11, 2018, San Diego office, 123pm PST

In anticipation of the strong gusty northerly winds, the Phoenix NWS office issued four (4) Urgent Weather Messages advising the public of advisory level north winds 20 to 30 mph with gust to 45 mph along with blowing dust. In fact, not only did both NWS office amend their aviation reports to reflect the gusty northeast to east winds but the Phoenix NWS office discussed the potential for blowing dust within it Area Forecast Discussions as early as February 9, 2018.[20]

While elevated wind speeds play a significant and important role in the transportation of dust, gust plays an equally significant role in deposition of particulates onto a monitor and the overall affect onto ambient air.[21] As winds and gusts increased on February 11, 2018 and transported windblown dust from open natural desert areas within Riverside County and Arizona, 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 for the degradation of air quality to a moderate or unhealthy level. In addition, the NWS service issued Area Forecast Discussions and Urgent Weather Messages advising of the potential of advisory level winds and blowing dust.

**FIGURE 3-1**
**$PM_{10}$ AND $PM_{2.5}$ CONCENTRATION COMPARISON**

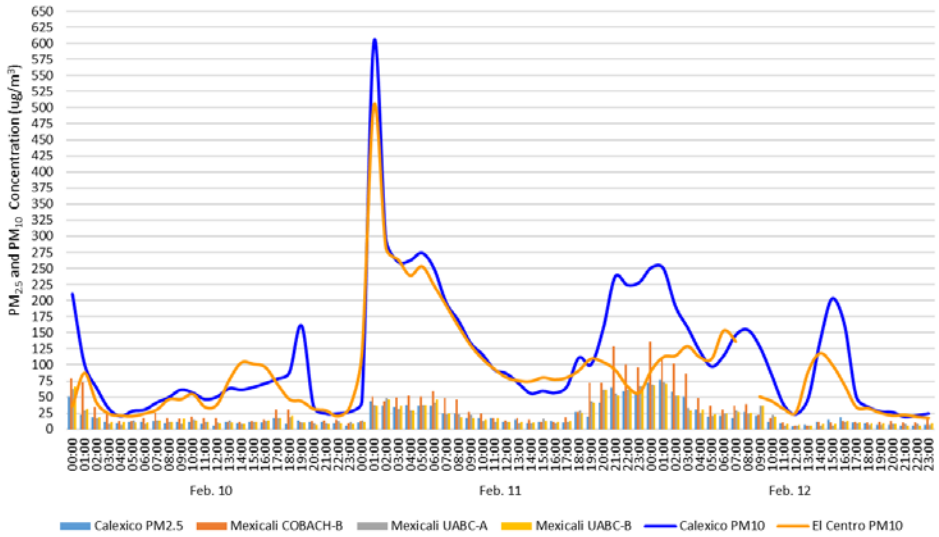



**Fig 3-1**: is a three-day graphical comparison of $PM_{10}$ and $PM_{2.5}$ for sites located in Imperial County, and Mexicali. Note sites located to the east or to the south measured higher 24-hour averaged concentrations compared to sites located to the west

[20] National Weather Service, Urgent Weather Message, Feb. 10, 2018 to Feb. 11, 2017, Phoenix office, 340am MST; 123pm MST; 158am MST; 800am MST

[21] 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**
**$PM_{10}$ AND $PM_{2.5}$ CONCENTRATION COMPARISON NON WIND EVENT**

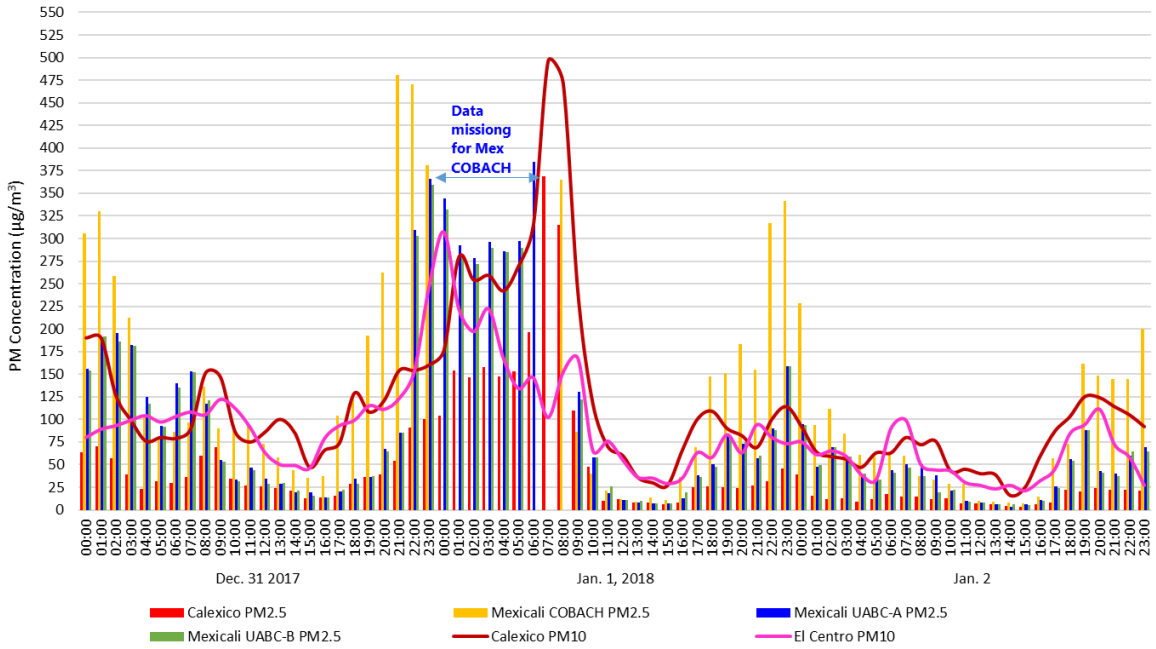



**Fig 3-2**: is a three-day graphical comparison of $PM_{10}$ and $PM_{2.5}$ for sites located in Imperial County, and Mexicali during a stagnant day when Mexicali celebrates the New Year. Note $PM_{2.5}$ is significantly higher than $PM_{10}$ during the hours when celebrations would have culminated brining in the New Year.

**Figure 3-3** below provides illustrations of morning meteorological conditions, as described above and demonstrated in the HYSPLITs, for February 11, 2018, which affected air quality in Imperial County causing an exceedance at the Calexico monitor.

**FIGURE 3-3**
**VISUAL RAMP-UP ANALYSIS AS DISCUSSED FOR FEBRUARY 11, 2018**

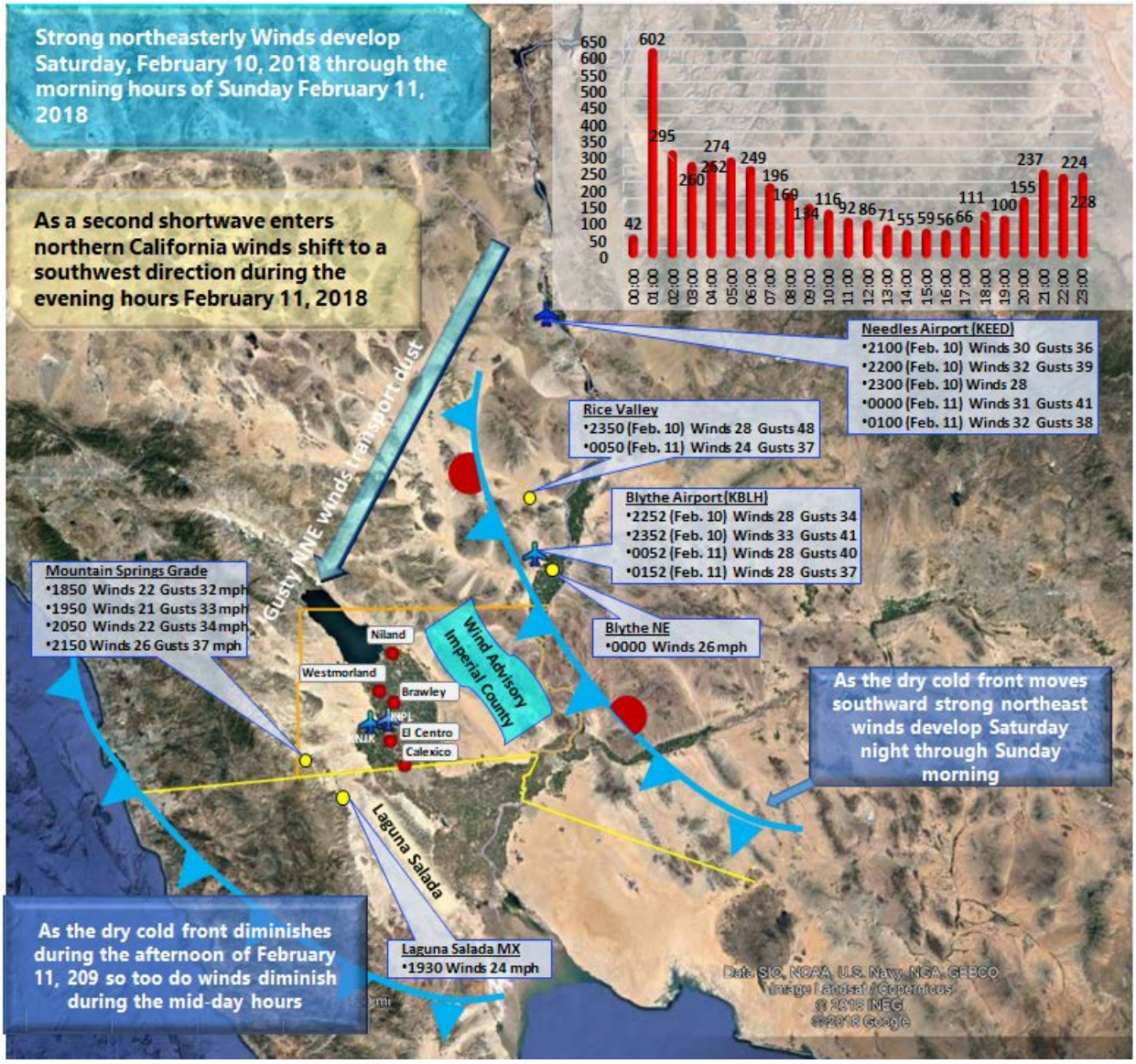



**Fig 3-3**: On February 11, 2019, Imperial County was affected by two systems one during morning the hours and the other during the evening hours. The combined effect of these winds caused an exceedance at the Calexico monitor. Google Earth base map

An indicator of the affect to air quality can be discerned from the level of visibility at any given time and day. While the ICAPCD air monitoring stations do not measure levels of visibility the local and surrounding airports do.[22] The Blythe Airport (KBLH), the El Centro

[22] 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

NAF (KNJK), the Jaqueline Cochran-Desert Resorts Airport (KTRM), and the Imperial County Airport (KIPL), all reported reduced visibility coincident with wind speeds, wind gusts and hourly concentrations of particulates at all air quality monitors. Although some airports, KNJK, KTRM, and KIPL measured winds below 25 mph blowing dust allowed for reduced visibility.[23] **Figure 3-4** and **Tables 3-1 through 3-4** provide information regarding the reduced visibility in Imperial County and the relation to hourly concentrations at local air monitors.

While **Figure 3-4** is a graphical representation of the reduced visibility within Imperial County and surrounding areas, **Tables 3-1 through 3-4** provide a temporal relationship of wind speeds, wind direction, wind gusts (if available), and $PM_{10}$ concentrations at the Calexico 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 3-4,** visibility at four of the major airports, the Blythe Airport (KBLH), El Centro NAF (KNJK), Janet Cochran-Desert Resorts Airport (KTRM), and Imperial County Airport (KIPL), reduced during the morning hours of February 11, 2018 coincident with elevated hourly concentrations at the air quality monitors in Imperial County.

sensor is critical and large areas should provide multiple sensors to provide a representative observation; http://www.nws.noaa.gov/asos/vsby.htm

[23] National Oceanic and Atmospheric Administration, Satellite and Information Service, National Environmental Satellite, Data and Information Service (NESDIS), 2018 Satellite Smoke Text Product, Sat., Feb. 10, 2019, https://www.ssd.noaa.gov/PS/FIRE/DATA/SMOKE/2018/2018B110420.html

**FIGURE 3-4**
**72-HOUR TIME SERIES $PM_{10}$ CONCENTRATIONS AND VISIBILITY**

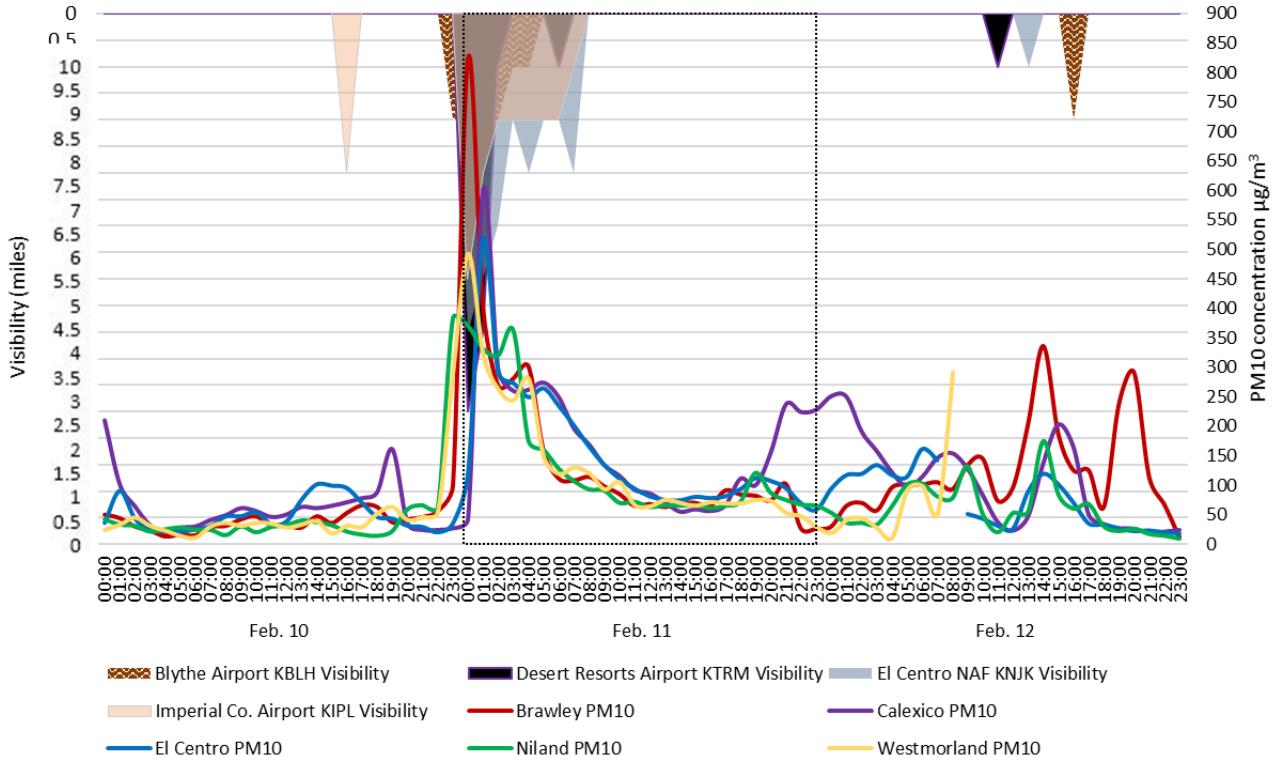



**Fig 3-4:** is a graphical representation of the compiled data from the Blythe Airport (KBLH), the Imperial County Airport (KIPL), the El Centro NAF (KNJK) and the Jaqueline-Cochran-Desert Resorts Airport (KTRM). Reported reduced visibility is coincident with elevated winds and hourly levels of concentrations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

Because the EPA accepts a high wind threshold for sustained winds of 25 mph in California and 12 other states[24] the **Tables 3-1 through 3-4** 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. Blue hours indicates February 10, 2018 hours.

[24] "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 FEBRUARY 11, 2018

| | NEEDLES AIRPORT (KEED) | | | RICE VALLEY (RVYC1) | | | BLYTHE NE (CI135) | | BLYTHE AIRPORT (KBLH) | | | WSTMD | BRLY | NLD | EC | CX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | W/S | W/G | W/D | W/S | W/G | W/D | W/S | W/D | W/S | W/G | W/D | PM10 (ug/m$^3$) | | | | |
| 2000 | 31 | | N | 31 | 44 | N | 4 | S | 15 | | NNW | 40 | 42 | 58 | 31 | 35 |
| 2100 | 30 | 36 | N | 35 | 48 | N | 4 | N | 21 | 29 | N | 45 | 46 | 64 | 29 | 24 |
| 2200 | 32 | 39 | N | 28 | 46 | NNE | 20 | NNE | 28 | 34 | NNW | 53 | 56 | 60 | 20 | 24 |
| 2300 | 28 | | N | 28 | 48 | N | 24 | NNE | 33 | 41 | N | 284 | 97 | 378 | 34 | 27 |
| 0000 | 31 | 41 | NNE | 24 | 37 | N | 26 | NNE | 28 | 40 | NNW | 479 | 825 | 365 | 116 | 42 |
| 0100 | 32 | 38 | N | 20 | 45 | N | 17 | N | 28 | 37 | N | 309 | 400 | 326 | 504 | 602 |
| 0200 | 21 | | N | 18 | 31 | N | 13 | N | 22 | | N | 253 | 269 | 313 | 282 | 295 |
| 0300 | 22 | | N | 18 | 31 | NNE | 12 | N | 21 | | N | 234 | 282 | 353 | 264 | 260 |
| 0400 | 20 | | N | 17 | 26 | N | 15 | N | 22 | | N | 268 | 302 | 170 | 239 | 262 |
| 0500 | 21 | | N | 17 | 25 | N | 10 | N | 16 | | NNW | 141 | 158 | 155 | 253 | 274 |
| 0600 | 18 | | N | 21 | 30 | N | 7 | N | 16 | | NNW | 114 | 112 | 123 | 223 | 249 |
| 0700 | 24 | | N | 18 | 29 | N | 4 | W | 18 | | N | 124 | 109 | 103 | 192 | 196 |
| 0800 | 23 | | N | 17 | 31 | N | 7 | NE | 18 | 28 | NNW | 116 | 115 | 91 | 160 | 169 |
| 0900 | 29 | | N | 15 | 25 | N | 14 | NNE | 17 | | N | 91 | 99 | 89 | 131 | 134 |
| 1000 | 22 | | N | 5 | 22 | NNW | 13 | NNE | 10 | | N | 103 | 86 | 69 | 109 | 116 |
| 1100 | 16 | | NNE | 3 | 14 | WNW | 11 | NNE | 5 | | NNW | 65 | 66 | 71 | 93 | 92 |
| 1200 | 6 | | NNE | 3 | 10 | NE | 9 | NE | 6 | | N | 64 | 69 | 62 | 80 | 86 |
| 1300 | 5 | | NNW | 4 | 9 | S | 9 | NE | 6 | | VRB | 74 | 64 | 65 | 75 | 71 |
| 1400 | 5 | | NNE | 4 | 9 | SW | 5 | NE | | | | 70 | 70 | 65 | 74 | 55 |
| 1500 | 3 | | NNE | 4 | 9 | SW | 2 | N | 3 | | SE | 65 | 71 | 65 | 80 | 59 |
| 1600 | 6 | | E | 2 | 9 | S | 3 | W | 0 | | N | 70 | 66 | 60 | 77 | 56 |
| 1700 | 3 | | E | 1 | 4 | N | 4 | W | 5 | | SSW | 67 | 92 | 63 | 80 | 66 |
| 1800 | 6 | | NW | 4 | 5 | E | 2 | S | 5 | | S | 66 | 85 | 69 | 91 | 111 |
| 1900 | 7 | | WSW | 1 | 5 | SE | 1 | S | 0 | | N | 72 | 83 | 116 | 109 | 100 |
| 2000 | 9 | | SW | 3 | 7 | ESE | 3 | SSE | 8 | | S | 70 | 75 | 83 | 104 | 155 |
| 2100 | 12 | | SW | 6 | 7 | NNE | 1 | NW | 6 | | SW | 51 | 103 | 71 | 92 | 237 |
| 2200 | 10 | | WSW | 6 | 8 | NE | 3 | W | 7 | | S | 46 | 27 | 64 | 67 | 224 |
| 2300 | 9 | | SSW | 7 | 11 | SSE | 2 | WNW | 5 | | SSE | 28 | 27 | 62 | 56 | 228 |

Wind data for Rice Valley (RCVC1) and Blythe NE (CI135) from the University of Utah's MesoWest system. Wind data for KBLH and KEED from the NCEI's QCLCD system. Wind speeds = mph; Direction = degrees. Blythe NE does not measure wind gusts. 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. **Blue** indicates hours of February 10, 2018.

**TABLE 3-2**
**WIND SPEEDS AND $PM_{10}$ CONCENTRATIONS AT FEBRUARY 11, 2018**

| | IMPERIAL COUNTY AIRPORT (KIPL) | | EL CENTRO NAF (KNJK) | | MOUNTAIN SPRINGS GRADE (TNSC1) | | | LAGUNA SALADA, MX (IBCLARUM2) | | CX | EC | NLD | BRLY | WSTMD |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HOUR | W/S | W/D | W/S | W/D | W/S | W/G | W/D | W/S | W/D | PM10 (ug/m³) | | | | |
| 2000 | 7 | W | 9 | WSW | 25 | 44 | SSW | 23 | SW | 35 | 31 | 58 | 42 | 40 |
| 2100 | 7 | WNW | 11 | W | 20 | 34 | SW | 20 | SSW | 24 | 29 | 64 | 46 | 45 |
| 2200 | 6 | NW | 9 | NNW | 11 | 27 | S | 12 | SW | 24 | 20 | 60 | 56 | 53 |
| 2300 | 9 | NW | 15 | N | 3 | 14 | NE | 4 | SW | 27 | 34 | 378 | 97 | 284 |
| 0000 | 10 | NNE | 11 | N | 6 | 11 | ENE | 9 | N | 42 | 116 | 365 | 825 | 479 |
| 0100 | 11 | NE | 5 | NNW | 7 | 12 | NE | 4 | ENE | 602 | 504 | 326 | 400 | 309 |
| 0200 | 8 | NNE | 3 | W | 6 | 12 | ENE | 5 | ESE | 295 | 282 | 313 | 269 | 253 |
| 0300 | 0 | N | 6 | NW | 5 | 9 | NE | 4 | W | 260 | 264 | 353 | 282 | 234 |
| 0400 | 3 | SW | 3 | N | 6 | 15 | ENE | 3 | WNW | 262 | 239 | 170 | 302 | 268 |
| 0500 | 0 | N | 0 | N | 2 | 9 | N | 2 | W | 274 | 253 | 155 | 158 | 141 |
| 0600 | 0 | N | 6 | NNW | 2 | 5 | ENE | 4 | W | 249 | 223 | 123 | 112 | 114 |
| 0700 | 3 | SW | 0 | N | 3 | 8 | NNE | 3 | W | 196 | 192 | 103 | 109 | 124 |
| 0800 | 3 | VRB | 0 | N | 6 | 11 | NNE | 3 | NW | 169 | 160 | 91 | 115 | 116 |
| 0900 | 0 | N | 0 | N | 7 | 11 | NNE | 2 | NNW | 134 | 131 | 89 | 99 | 91 |
| 1000 | 5 | ENE | 5 | VRB | 6 | 12 | N | 7 | NNW | 116 | 109 | 69 | 86 | 103 |
| 1100 | 5 | NE | 5 | N | 6 | 15 | N | 0 | NE | 92 | 93 | 71 | 66 | 65 |
| 1200 | 3 | VRB | 0 | N | 6 | 11 | NNW | 8 | NNE | 86 | 80 | 62 | 69 | 64 |
| 1300 | 0 | N | 0 | N | 4 | 9 | E | 4 | ESE | 71 | 75 | 65 | 64 | 74 |
| 1400 | 5 | W | 7 | S | 5 | 10 | ESE | 0 | ESE | 55 | 74 | 65 | 70 | 70 |
| 1500 | 6 | SSW | 3 | SSE | 5 | 12 | ENE | 4 | NE | 59 | 80 | 65 | 71 | 65 |
| 1600 | 3 | SSW | 5 | S | 3 | 8 | N | 1 | ENE | 56 | 77 | 60 | 66 | 70 |
| 1700 | 5 | W | 0 | N | 13 | 21 | WSW | 3 | ENE | 66 | 80 | 63 | 92 | 67 |
| **1800** | **3** | **SSW** | **3** | **SSW** | **22** | **32** | **WSW** | **7** | **ENE** | **111** | **91** | **69** | **85** | **66** |
| **1900** | **0** | **N** | **7** | **WSW** | **21** | **33** | **WSW** | **24** | **WSW** | **100** | **109** | **116** | **83** | **72** |
| **2000** | **6** | **SSW** | **9** | **WSW** | **22** | **34** | **SW** | **11** | **WSW** | **155** | **104** | **83** | **75** | **70** |
| **2100** | **8** | **S** | **11** | **W** | **26** | **37** | **SW** | **8** | **WSW** | **237** | **92** | **71** | **103** | **51** |
| **2200** | **6** | **SW** | **6** | **SW** | **17** | **42** | **SSW** | **0** | **West** | **224** | **67** | **64** | **27** | **46** |
| **2300** | **9** | **SW** | **8** | **S** | **15** | **26** | **SW** | **5** | **SSW** | **228** | **56** | **62** | **27** | **28** |

Wind data for KIPL and KNJK from the NCEI's QCLCD system. Wind data for Mountain Springs Grade (TNSC1) from the University of Utah's MesoWest system. Wind data for Laguna Salada from the Weather Underground. 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. **Blue** indicates hours of February 10, 2018.

As mentioned above, Area Forecast Discussions or Urgent Weather Messages containing Wind Advisories described the gusty northeasterly winds for the region extending from Riverside County and Arizona. As the first weather pattern, a low-pressure shortwave with an associated dry cold front passed through strong gusty northeasterly winds affected different regional air monitors in Riverside County, Imperial County and Arizona during the early morning hours of February 11, 2018. As the early morning cold front diminished winds similarly diminished until a second shortwave trough quickly moved south reaching northern California during the evening hours, of February 11, 2018 allowing for some southwesterly influence into the region affecting southeastern California (**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.[25] Because transported windblown dust entered Imperial County during the evening hours of Saturday, February 10, 2018 through the morning hours of Sunday, February 11, 2018, air quality within Imperial County degraded to unhealthy levels. Overall, the strong northeasterly winds affected air quality in Imperial County.

**FIGURE 3-5**
**IMPERIAL VALLEY AIR QUALITY INDEX FOR CALEXICO**
**FEBRUARY 11, 2018**

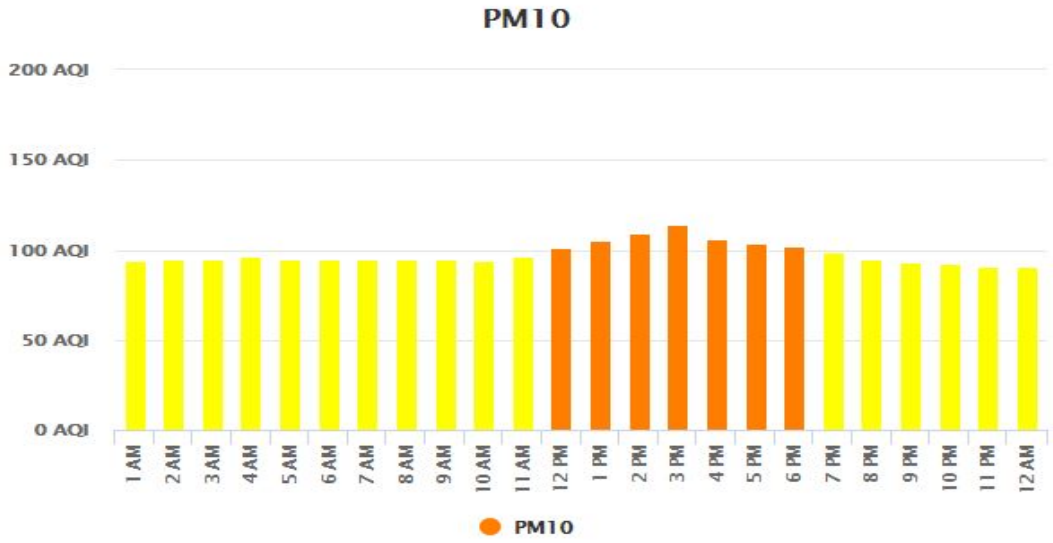



**Fig 3-5:** The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Yellow" or Moderate level to an "Orange" or Unhealthy for Sensitive Groups level

## III.1 Summary of Forecasts and Warnings

Both NWS offices in San Diego and Phoenix issued Area Forecast Discussions that informed the public regarding the impending effects of a low-pressure shortwave and associated dry cold front that was moving into the interior West by Saturday evening February 10, 2018. In addition, all long term area forecast discussions discussed the impending second shortwave from the north and its arrival by Sunday evening February 11, 2018. The first system, under Santa Ana conditions, brought strong northeasterly winds while the second system brought gusty southwesterly winds. The introduction of

[25] 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

the new system sufficiently affected wind speeds and direction to allow some southwesterly influence during the evening hours of February 11, 2018.[26] Both NWS offices began amending their aviation reports, starting February 10, 2018, identifying the gusty northeast to east winds with surface gusts above 34 mph.[27]

In addition to the Area Forecast Discussion, the NWS office in Phoenix issued four (4) Urgent Weather Messages advising the public of advisory level north winds 20 to 30 mph with gust to 45 mph. **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 San Bernardino County, 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 Imperial County monitors. Data analysis indicates that on February 11, 2018 different sites measured wind speeds at or above 25 mph.

[26] National Weather Service, Area Forecast Discussion, Feb. 11, 2018, San Diego office, 311am PST & 807am PST; Phoenix office 304am MST

[27] National Weather Service, Urgent Weather Message, Feb. 10, 2018 to Feb. 11, 2017, Phoenix office, 340am MST; 123pm MST; 158am MST; 800am 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 Calexico monitor for the period of January 1, 2010 through February 11, 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).[28] 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 February 11, 2018, as measured by the Calexico monitor, were used to establish the historical and seasonal variability over time.[29] All figures illustrate that the exceedance, which occurred on February 11, 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.

[28] 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.

[29] FRM sampling ended December 2016.

**FIGURE 4-1**
**CALEXICO HISTORICAL COMPARISON**
**FRM AND FEM $PM_{10}$ 24-HR AVG CONCENTRATIONS**
**JANUARY 1, 2010 TO FEBRUARY 11, 2018**

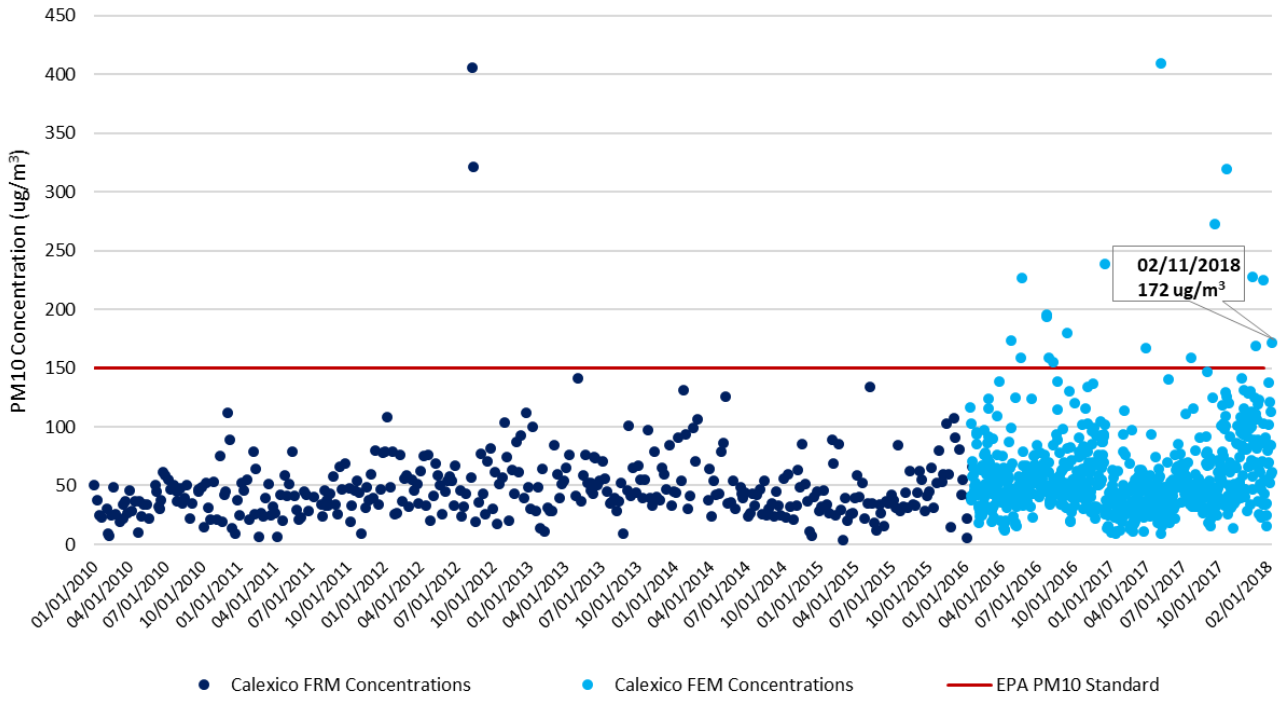
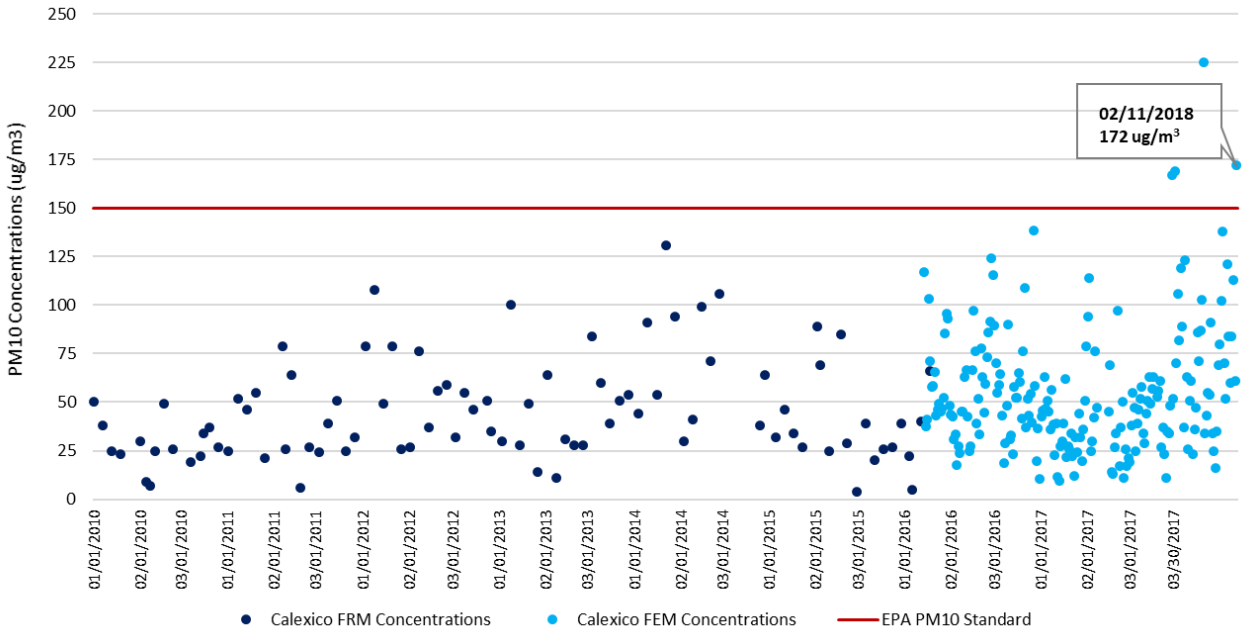



**Fig 4-1**: A comparison of $PM_{10}$ historical concentrations demonstrates that the measured concentration of 172 µg/$m^3$ on February 11, 2018 by the Calexico monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-1,** for Calexico included 1,175 sampling days (January 1, 2010 through February 11, 2018). Of the 1,175 sampling days the Calexico monitor measured 20 exceedance days which translates into an occurrence rate less than 2%. Historically, there were four (4) exceedance days measured during the first quarter, four (4) exceedance days measured during the second quarter, nine (9) exceedance days measured during the third quarter; and three (3) exceedance days measured during the fourth quarter.

**FIGURE 4-2**
**CALEXICO SEASONAL COMPARISON**
**FRM AND FEM $PM_{10}$ 24-HR AVG CONCENTRATIONS**
***JANUARY 1, 2010 TO FEBRUARY 11, 2018**




*** Quarterly: January 1, 2010 to December 31, 2017 and January 1, 2018 to February 11, 2018**
**Fig 4-2**: A comparison of $PM_{10}$ seasonal concentrations demonstrates that the measured concentration of 172 µg/$m^3$ on February 11, 2018 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 311 sampling days, 292 credible samples and four (4) exceedance days. This translates to less than a 1.5% seasonal exceedance occurrence rate.

Examining the historical and seasonal time series concentrations as they relate to the February 11, 2018 measured exceedance, the exceedance measured on February 11, 2018 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 deserts of the Riverside County, Arizona and Baja California, Mexico. The origination of these emissions from these areas affected all the air quality monitors on February 11, 2018. Since Imperial County does not have jurisdiction over emissions emanating from Riverside, Arizona or Mexico 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**

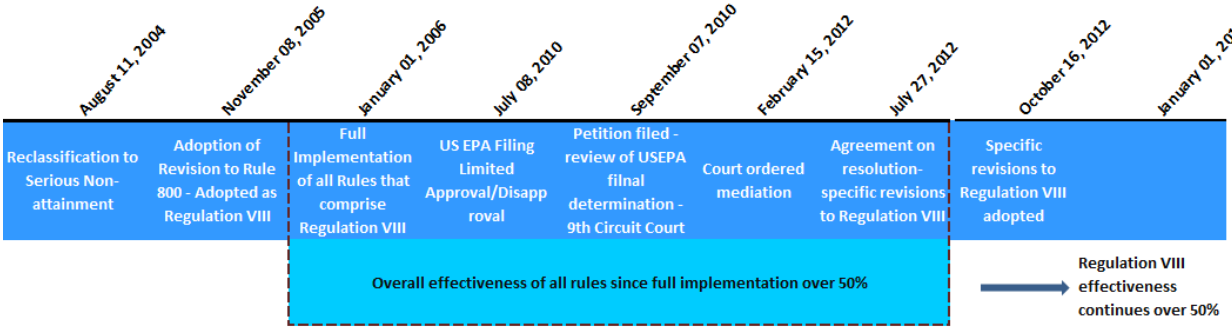



**Fig 5-1**: Regulation VIII Graphic Timeline

## 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 February 11, 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 February 11, 2018 event, wind speeds were above the 25 mph threshold, overcoming the BACM 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 Calexico during the February 11, 2018 $PM_{10}$ exceedance. Both permitted and non-permitted sources are required to comply with Regulation VIII requirements that address fugitive dust emissions. The identified permitted sources are Aggregate Products, Inc., US Gypsum Quarry, Imperial Aggregates (Val-Rock, Inc., and Granite Construction), US Gypsum Plaster City, Clean Harbors (Laidlaw Environmental Services), Bullfrog Farms (Dairy), Burrtec Waste Industries, Border Patrol Inspection station, Centinela State Prison, various communications towers not listed and various agricultural operations. Non-permitted sources include the wind farm known as Ocotillo Express, and a solar facility known as CSolar IV West. Finally, the desert regions are under the jurisdiction of the Bureau of Land Management and the California Department of Parks (Including Anza Borrego State Park and Ocotillo Wells).

An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based $PM_{10}$ emissions. There were no complaints filed on February 11, 2018, officially declared as No Burn Day, related to agricultural burning, waste burning or dust.

**FIGURE 5-2**
**PERMITTED SOURCES**

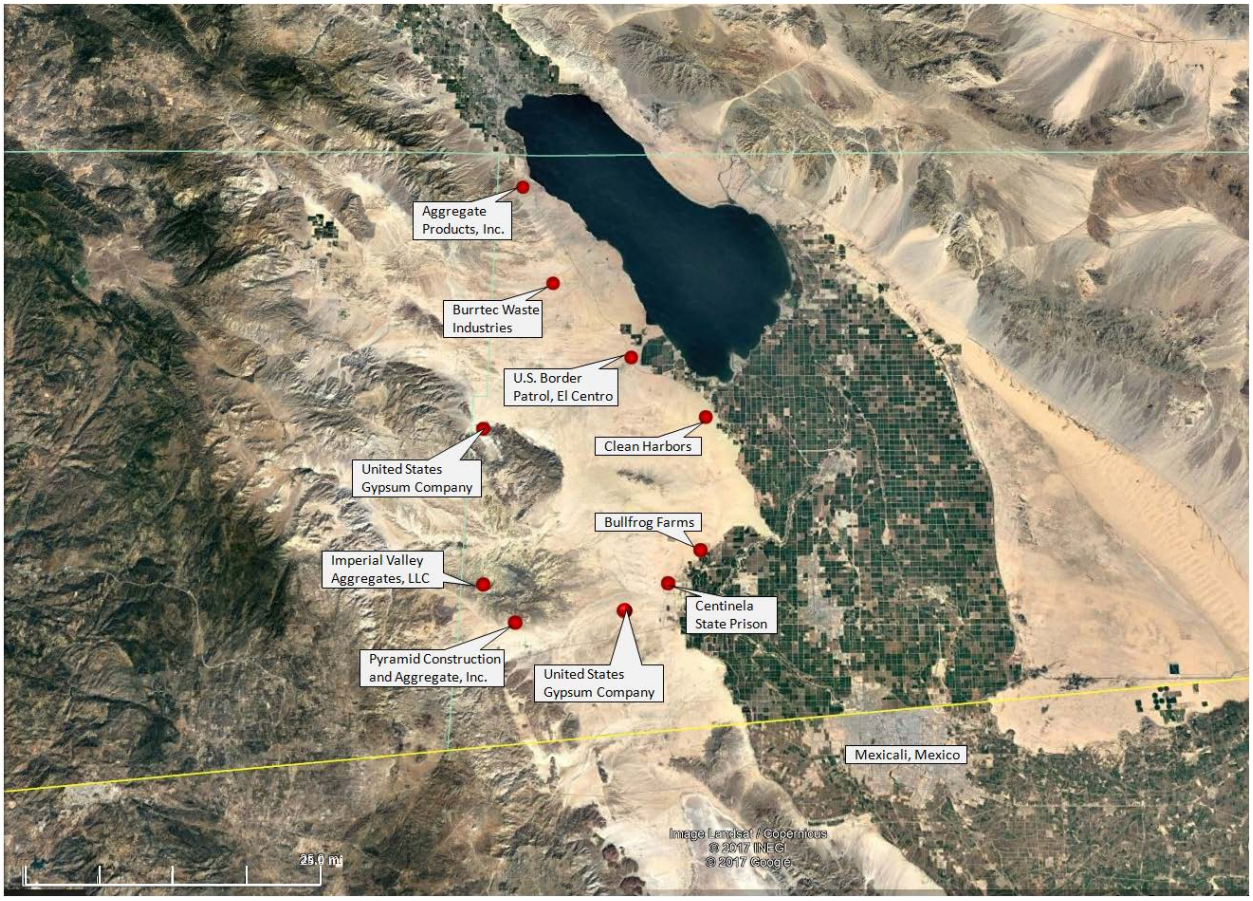



**Fig 5-2:** The above map identifies those permitted sources located west, northwest and southwest of the Calexico monitor. The green line to the north denotes the political division between Imperial and Riverside counties. The yellow line below denotes the international border between the United States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

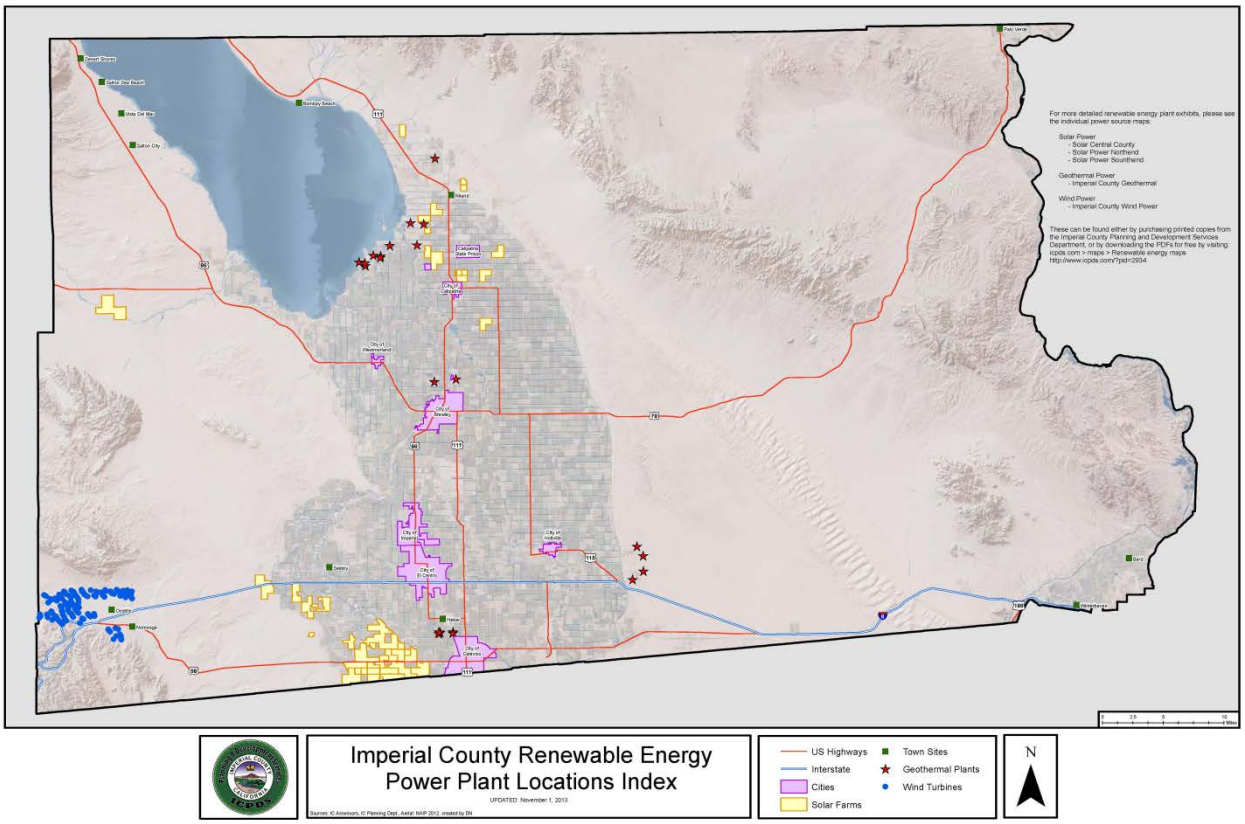



**Fig 5-3:** The above map identifies those power sources located west, northwest and southwest of the Calexico monitor. Blue indicate the Wind Turbines, Yellow are the solar farms and stars are geothermal plants

# 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, Santa Ana type events occur at higher elevations but on occasion the dynamics of strong northerly winds race across the high desert (Mojave Desert) where blow-sand is transported into Imperial County. The strong northeasterly winds during the morning hours of February 11, 2018 resulted from what the NWS identified as a low-pressure shortwave and associated dry cold front moving into the interior West by Saturday evening February 10, 2018. In addition, the southwesterly winds during the evening hours resulted from a second shortwave entering northern California Sunday evening February 11, 2018. The first system, under Santa Ana conditions, brought strong northeasterly winds while the second system brought gusty southwesterly winds. The introduction of the new system sufficiently affected wind speeds and direction to allow some southwesterly influence during the evening hours of February 11, 2018.[30] The 24 mph

The gusty northeasterly winds blew through the region and were of a magnitude that prompted the NWS offices in Phoenix to issue four (4) separate Urgent Weather Messages.

Strong gusty northeasterly winds blew over the open natural deserts within Riverside and Arizona, during the morning hours of February 11, 2018 onto the air quality monitors in Imperial County. As the system moved further southwest, winds reduced along with measured concentrations. However, as a second shortwave entered northern California during the evening hours of February 11, 2018 southwesterly winds transported windblown emissions from the Laguna Salada in Mexico onto the Calexico monitor. The combined effect of both systems increased emissions sufficiently with the Calexico areas so as to cause an exceedance of the NAAQS. Finally, the intensity of the gusty northeasterly winds was sufficient to overcome BACM in place, in Imperial County

## VI.1 Affects Air Quality

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

[30] National Weather Service, Area Forecast Discussion, Feb. 11, 2018, San Diego office, 311am PST & 807am PST; Phoenix office 304am MST

relationship between the monitored exceedance and the February 11, 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 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 natural open deserts of eastern Riverside County, Arizona and the Laguna Salada in northern 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 were caused by naturally occurring gusty northeasterly and southwesterly winds that transported windblown dust into Imperial County and other parts of southern California from areas located within the Sonoran Desert regions to the north, northeast and south, southwest of Imperial County. These facts provide strong evidence that the $PM_{10}$ exceedance at the Calexico monitor on February 11, 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 Calexico on February 11, 2018, was caused by the transport of windblown dust into Imperial County by gusty northeasterly and southwesterly winds associated with two shortwave lows' that entered California and moved 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 monitor in Imperial County demonstrates a consistency of

elevated gusty northeasterly and southwesterly winds with elevated concentrations of $PM_{10}$ on February 11, 2018. In addition, temporal analysis indicates that the elevated $PM_{10}$ concentrations and the gusty northeasterly and southwesterly 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 February 11, 2018.

### 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 gusty northeasterly winds associated with the low-pressure shortwave and dry cold front, and the southwesterly winds that preceded a second low pressure trough as it entered northern California. The information provides a clear causal relationship between the entrained windblown dust and the $PM_{10}$ exceedance measured at the Calexico monitor in Imperial County on February 11, 2018.

In particular, the clear causal relationship and not reasonably controllable or preventable sections provide evidence that northeasterly and southwesterly winds associated with the February 11, 2018 high wind dust event generated emissions from the natural open desert areas located as far Riverside County, Arizona and during the evening from as far south as 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.[31]

[31] 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.