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Governor

ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Assessment of Qualification for Treatment under the Arizona Natural and Exceptional Events Policy for the High Particulate (PM₁₀) Concentration Events in the Yuma Area on May 21, 2007

Background

The Arizona Department of Environmental Quality (ADEQ) issues Dust Control Action Forecasts for the Yuma and Phoenix areas as part of the Natural Events Action Plan for these areas. On Sunday May 20, 2007, in response to an approaching intense but dry mid-latitude trough, ADEQ air quality forecasters issued the Yuma and Vicinity Dust Control Action Forecast which called for a moderate risk of wind-blown dust in the Yuma Area for Monday May 21st. The forecast called for breezy south-southeasterly winds associated with an upper level trough and surface low pressure system centered over southern Nevada. Sustained wind speeds of 10-20 mph were expected during the morning hours, increasing to 15-25 mph out of the south during the afternoon and evening. This potential wind-blown dust event equated to a moderate risk of exceeding the PM₁₀ National Ambient Air Quality Standards (NAAQS) in the Yuma area. The forecasts/advisories satisfy the requirement in 40 CFR 51.920(a)(1).

During the early morning of May 21st, a broad upper level trough was in place throughout the western U.S. with two shortwaves rotating around the base of the larger trough. One of these shortwaves was located over New Mexico, Texas, and Colorado, while the second contained an axis through Nevada and southeastern California, extending all the way south to Baja, Mexico. Meanwhile, a surface low pressure system was centered over southern Nevada with a fairly tight north / south oriented pressure gradient in place. As the day progressed, this surface low pressure system strengthened from 1008 mb in the early morning to 1000 mb by late afternoon on the 21st. As this low pressure

strengthened, the surface pressure gradient increased, leading to strong southerly winds which lasted for much of the day. While much of the state experienced moderate to strong winds on the 21st, the Yuma area and other locations along the Colorado River Valley likely experienced enhanced winds due to the upstream flow which is funneled through the Colorado River Valley. Locations that typically see higher winds speeds, such as Imperial Valley and El Centro in California, saw significantly lighter winds on the 21st. Meanwhile, Blythe, located upstream in the Colorado River Valley, saw wind speeds similar to those recorded in Yuma. Reduced visibilities were also reported in Blythe due to the strong winds and blowing dust (see attachment). All appropriate state implementation plan (SIP) control measures were in place during the event demonstrating, per 40 CFR 50.1(j), that the event “is not reasonably controllable or preventable.”

Strong winds were observed throughout the Yuma area on May 21st, 2007. The initialization of the wind-blown dust event is evident in the Yuma clear-air mode radar images as well as the Arizona Meteorological Network (AzMET) and National Weather Service (NWS) monitors (Fig. 1). The significant wind event in Southwest Arizona brought elevated ambient concentrations of PM₁₀ to the Yuma area that exceeded the NAAQS at the Yuma Courthouse monitor operated by ADEQ. The fact that ambient concentrations exceed the NAAQS satisfies the criteria in 40 CFR 50.1(j) that the event “affects air quality.”

The following are the key PM₁₀ monitor readings for the monitors examined in this report:

Monitor (Operator/Type)	AQS ID*	24-hr Avg PM ₁₀	1-hr Max PM ₁₀	Max Time	Flag**
YUMA AREA					
Yuma Courthouse (ADEQ/BAM)	04-027-0004*	161	499	1000	A or RJ
Mexico Supersite (ADEQ/BAM)	80-026-8012*	118	245	1000	None

* EPA Air Quality System Identification Number

** 24-hr PM₁₀ concentration influenced by natural or exceptional event to be flagged.

Type Abbreviations: BAM – Beta-Attenuation Mass Monitor (Continuous monitor)

TEOM – Tapered Element Oscillating Microbalance Monitor (Continuous)

The preliminary findings from this analysis were presented at a stakeholders meeting on November 13, 2007, and were made available for public review during a comment period that ended November 30, 2007. During that time, no comments were received from the public. ADEQ presented and discussed this final demonstration at a stakeholder

meeting on May 28, 2008. ADEQ has finalized this demonstration, which was made available for public comment from August 11, 2008 through September 10, 2008. Any comments that were received were forwarded to EPA with this demonstration pursuant to 40 CFR 51.14(c)(3)(i).

NORTHWEST PHOENIX							
Hr	T(F)	RH	Rn	Spd	Max	Dir	
1	79	20	0	5	14	SW	
2	75	24	0	1	4	S	
3	68	33	0	0	2	N	
4	63	36	0	0	2	NW	
5	62	38	0	1	4	NW	
6	59	44	0	0	2	NW	
7	64	45	0	1	3	NW	
8	78	29	0	1	3	NE	
9	80	23	0	2	7	E	
10	82	20	0	4	10	S	
11	84	17	0	5	11	S	
12	85	16	0	4	10	S	
1	87	14	0	5	11	S	
2	89	13	0	5	11	S	
3	91	11	0	7	14	SW	
4	91	11	0	6	12	SW	
5	91	11	0	7	13	SW	
6	91	12	0	7	12	SW	
7	88	15	0	7	13	SW	
8	85	16	0	9	15	SW	
9	82	19	0	6	13	SW	
10	80	25	0	6	10	SW	
11	78	25	0	7	13	SW	
12	43	65	0	3	7	E	

SOUTHEAST PHOENIX							
Hr	T(F)	RH	Rn	Spd	Max	Dir	
1	68	34	0	3	6	SE	
2	65	38	0	4	6	SE	
3	64	44	0	4	6	SE	
4	64	47	0	3	4	SE	
5	63	52	0	3	4	SE	
6	61	60	0	1	3	S	
7	65	50	0	2	4	S	
8	74	35	0	3	5	SE	
9	79	29	0	5	14	SW	
10	82	24	0	7	15	S	
11	84	19	0	6	13	SW	
12	85	17	0	5	15	SW	
1	87	14	0	7	15	SW	
2	89	12	0	7	17	SW	
3	90	11	0	7	17	SW	
4	91	11	0	7	17	SW	
5	90	10	0	10	18	SW	
6	89	12	0	7	17	SW	
7	87	11	0	8	14	SW	
8	84	14	0	7	15	SW	
9	81	20	0	6	14	W	
10	80	28	0	7	17	W	
11	78	34	0	6	11	SW	
12	75	28	0	7	16	SW	

NWS-Yuma MCAS							
Hr	T(F)	VR	Dust	Spd	Gust	Dir	
1	74	10		13	13	S	
2	73	10		13	13	SE	
3	73	10		15	15	SE	
4	72	10		16	16	SE	
5	71	10		15	15	SE	
6	71	10		16	22	SE	
7	72	10		20	28	SE	
8	75	7		25	31	SE	
9	78	7		17	26	S	
10	81	8		18	18	S	
11	85	6		22	22	S	
12	87	5	BLDU	21	30	S	
1	90	7		18	18	S	
2	91	7		23	31	S	
3	90	9		20	28	S	
4	92	10		20	20	S	
5	89	7		21	28	SE	
6	87	8		18	18	S	
7	83	8		23	28	S	
8	79	10		16	16	S	
9	77	10		13	13	S	
10	75	10		14	14	S	
11	74	10		18	25	SE	
12	73	10		18	28	SE	

Event Contrib. Analysis			
Hourly PM ₁₀ Conc. (µg/m ³)			
MONITORS:	Hr	1	2
1-YUMA-CH	1	22	44
2-MEX-SS	2	19	32
	3	24	43
	4	29	40
	5	29	37
	6	30	44
	7	37	59
	8	118	96
	9	310	171
	10	301	176
	11	499	245
	12	401	216
	1	376	172
	2	293	154
	3	241	212
	4	204	152
	5	191	134
	6	204	138
	7	237	209
	8	119	173
	9	79	112
	10	52	78
	11	39	49
	12	28	47

24-Hr. Avg PM₁₀ with W/O: 5, 6, 30, 44, 29, 37, 59, 118, 310, 301, 499, 401, 376, 293, 241, 204, 191, 204, 237, 119, 79, 52, 39, 28

Monitor: 161, 48, 56, 118, 56, 310, 171, 301, 176, 499, 245, 401, 216

> NAAQS < NAAQS
Pink=Event Contrib.

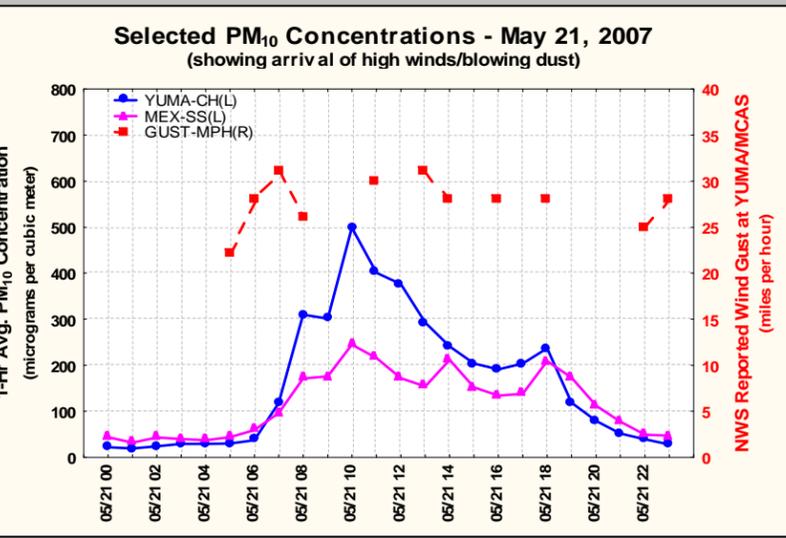
Conclusion: As shown above, the PM₁₀ concentration would have been below the NAAQS "BUT FOR" the event (hours highlighted in pink).



Figure 1. Key Data for Event of May 21, 2007

MISC DATA	KEY	PM10 PLOT
CEN. AZ WINDS	SO AZ WINDS	SAT IMAGES
WINDS	WINDS	YUMA MAP & FORECAST

SUMMARY OF EVENT
Yuma experienced southeast winds with southern gusts of 30 mph between 7:00 a.m. and noon. The area experienced reduced visibility beginning at 7:00 a.m. and blowing dust in the 11:00 a.m. hour. Visibility dropped to 5 statute miles by noon.



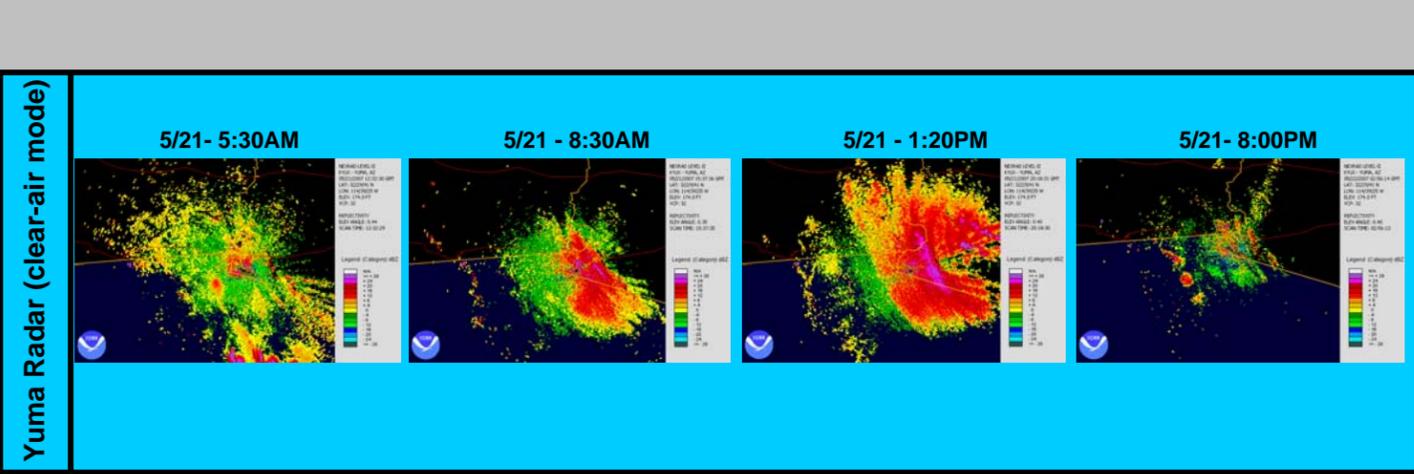
PARKER							
Hr	T(F)	RH	Rn	Spd	Max	Dir	
1	67	46	0	7	11	S	
2	65	51	0	6	7	S	
3	66	47	0	7	12	S	
4	64	51	0	5	10	S	
5	67	44	0	5	11	S	
6	65	49	0	4	7	S	
7	68	50	0	4	7	S	
8	76	38	0	6	9	S	
9	79	34	0	7	9	S	
10	83	28	0	7	11	S	
11	85	27	0	9	14	S	
12	88	23	0	12	20	SW	
1	90	21	0	16	22	SW	
2	91	22	0	15	21	SW	
3	93	22	0	15	22	SW	
4	93	20	0	16	22	SW	
5	93	17	0	16	20	SW	
6	91	20	0	14	18	SW	
7	88	23	0	10	15	SW	
8	82	30	0	7	11	SW	
9	76	36	0	7	13	SW	
10	78	33	0	10	15	SW	
11	76	35	0	10	15	SW	
12	74	39	0	11	16	S	

BUCKEYE							
Hr	T(F)	RH	Rn	Spd	Max	Dir	
1	70	33	0	2	4	W	
2	68	34	0	2	5	NE	
3	67	31	0	3	6	N	
4	65	35	0	4	6	NE	
5	65	39	0	2	5	NE	
6	63	44	0	2	4	E	
7	67	44	0	2	5	E	
8	77	30	0	2	7	SE	
9	80	26	0	2	6	E	
10	82	24	0	2	6	W	
11	83	19	0	4	9	SW	
12	85	17	0	6	11	SW	
1	87	15	0	4	11	SW	
2	89	13	0	6	13	S	
3	91	13	0	7	18	SW	
4	91	14	0	8	15	SW	
5	91	15	0	9	17	SW	
6	89	18	0	10	16	SW	
7	85	21	0	11	17	SW	
8	81	24	0	8	14	SW	
9	77	31	0	6	14	SW	
10	75	34	0	8	15	SW	
11	71	40	0	6	15	W	
12	71	33	0	5	7	N	

MARICOPA							
Hr	T(F)	RH	Rn	Spd	Max	Dir	
1	72	27	0	4	7	S	
2	71	29	0	3	5	S	
3	71	30	0	3	7	SE	
4	69	32	0	3	5	SE	
5	68	36	0	2	5	SE	
6	67	40	0	4	6	SE	
7	71	39	0	4	7	S	
8	75	33	0	7	16	S	
9	80	24	0	15	22	S	
10	83	18	0	13	23	S	
11	85	16	0	8	16	SW	
12	87	12	0	8	17	SW	
1	90	10	0	6	15	SW	
2	92	8	0	7	15	SW	
3	93	9	0	9	22	SW	
4	94	9	0	11	19	SW	
5	93	10	0	11	19	SW	
6	92	11	0	11	16	SW	
7	89	13	0	9	17	SW	
8	85	19	0	8	13	SW	
9	81	25	0	8	14	SW	
10	80	31	0	11	18	SW	
11	78	32	0	10	18	SW	
12	75	30	0	10	16	S	

Historical Distribution					
5-Yr. Dist. of Values (µg/m ³)					
MONITORS:	Column Index	Yr - All Data (5-Yrs)			
1-YUMA-CH	Yr	Sea	Sea		
2-MEX-SS	Yr	Sea	Sea		
	Mon 1	Mon 2			
	Yr	Sea	Yr	Sea	
	0.5%	12	9	29	21
	1.0%	14	14	35	26
	2.5%	16	16	46	38
	5%	19	19	54	48
	10%	23	22	62	58
	25%	31	29	79	74
	50%	42	40	104	96
	75%	57	51	149	127
	90%	77	76	206	180
	95%	96	109	247	211
	97.5%	127	182	290	256
	99.0%	186	210	318	331
	99.5%	211	212	351	376
	max	349	349	446	446
	Flagged Value	161	N/A		

Conclusion: Flagged Value is exceptional in nature (eg. greater than 95% of all data)



YUMA							
Hr	T(F)	RH	Rn	Spd	Max	Dir	
1	69	41	0	1	2	NE	
2	67	49	0	1	3	NE	
3	65	56	0	1	3	NE	
4	65	65	0	1	3	NE	
5	65	75	0	2	6	E	
6	67	77	0	4	8	SE	
7	69	70	0	6	14	SE	
8	73	61	0	9	15	SE	
9	76	54	0	11	17	SE	
10	80	49	0	14	20	S	
11	82	45	0	13	20	S	
12	84	36	0	13	22	S	
1	86	30					

Assessment under the Technical Criteria Document (TCD)

1. Properly qualify and validate the air quality measurement to be flagged. As this was not a filter sampling date (1-in-6 run day), only data from the continuous analyzers were examined. The air quality monitoring data were reviewed by the agency responsible for operation of the monitor. All hourly PM₁₀ readings from the Yuma Courthouse and Mexico Supersite were valid for May 21st. Audits of the analyzers revealed operations were within acceptable tolerance. No local sources were reported as significantly contributing to the air quality episode.

2. Review suspected contributing sources. The NWS and AzMET surface data for Arizona, along with the clear-air mode radar images from Yuma, provide a good explanation of the meteorological conditions that were in place on May 21st. Strong, southerly, up-river winds were occurring in the Yuma area due to a tight pressure gradient in place caused by a surface low pressure system over southern Nevada and an associated shortwave trough. As the low pressure system intensified, winds began to increase in southwestern Arizona. Due to these windy conditions, loose and unstable soils were easily picked up and transported across the region. The southerly flow and blowing dust can be seen in the radar images in Figure 1. The greatest radar returns were located just east of Yuma, while areas to the southwest of Yuma experienced lighter returns. These radar returns are consistent with the PM₁₀ concentrations measured at the Yuma Courthouse and the Mexico Supersite, with the Mexico Supersite measuring lower concentrations of PM₁₀. The timing of these radar data is also consistent with the high winds and elevated levels of PM₁₀. Finally, reduced visibilities reported at the Yuma Marine Corps Air Station (MCAS) were coincident with elevated PM₁₀ concentrations measured at Yuma Courthouse and Mexico Supersite.

3. Examine all air quality monitoring information. Data from all monitors in the network were reviewed. Monitors from the affected areas are summarized in the table in the Background section of this assessment. Pursuant to 40 CFR 50.14(c)(3)(iii)(C), the "Historical Distribution" Table in Figure 1 has been included to demonstrate that the event is associated with a measured concentration in excess of normal historical fluctuations, including background (i.e., concentrations greater than the 95th percentile). Monitors with readings greater than that of the NAAQS on May 21st, 2007, which should be flagged, include Yuma Courthouse.

4. Examine the meteorological conditions before and during the event. The AzMET meteorological data are

summarized in Figure 1. The wind data are highlighted yellow if the max wind speed in the hour exceeds 15 mph and orange if it exceeds 25 mph. Yuma experienced hourly max wind speeds greater than 15 mph for nearly the entire day, with a number of hours recording max wind speeds greater than 25 mph at the Yuma MCAS. As can be seen in Figure 1, wind speeds at Yuma Valley were slightly lower than those at the MCAS, but remained strong from sunrise until sundown. This timing corresponds to the onset of elevated PM₁₀ concentrations recorded at the Yuma Courthouse monitoring site. Strong winds continued for much of the day on May 21st, and this accounted for the long duration of the elevated PM₁₀ event.

5. Perform a qualitative attribution to emission source(s). All evidence indicates the elevated PM₁₀ concentrations in the Yuma area can be attributed to soil emissions that were transported over a broad region. No source-specific emission allocation is possible based on the data available for analysis. The hourly concentration data do not show any significant source other than the wind-blown dust event occurring on May 21st. Observational reports of reduced visibility and blowing dust from trained officials in Yuma and Blythe are further proof that the elevated PM₁₀ concentrations were attributed to soil emissions. These reports, in addition to the visual evidence seen in the radar images in Figure 1, are evidence that elevated PM₁₀ concentrations in Yuma can be attributed to soil emissions.

6. Estimation of Contribution from Source or Event. The primary source appears to be wind-blown dust over southwestern Arizona for which there is not an effective or efficient method to estimate the relative contributions from specific sources. The demonstration analysis contained in this report establishes the linkage between the measurements to be flagged and the event, thus satisfying the requirement in 40 CFR 50.14(c)(3)(iii)(B). Pursuant to 40 CFR 50.14(c)(3)(iii)(D), the "Event Contrib. Analysis" Table in Figure 1 has been included to demonstrate that there would have been no exceedance or violation but for the event (i.e., the contribution during the event overwhelmed the 24-hour average).

7. Determination that a Natural or Exceptional Event Contributed To an Exceedance. Based on this analysis, the event satisfies the requirement in 40 CFR 50.1(j) that the elevated concentrations at the Yuma Courthouse monitoring site were attributed to a natural event.

Conclusion

Long-range transport of dust from soils. The region wide elevated PM₁₀ event on May 21st, 2007 in Yuma was the result of the transport of dust and soils from high winds that suspended natural soils and soils from areas where Best Available Control Measures are in place and should be

flagged for air quality planning purposes. The "high wind" flag (A or RJ) should be applied to the monitor readings indicated in the table at the beginning of this report, as the monitor would have been below the NAAQS but for the contribution of the event.



**YUMA AND VICINITY
DUST CONTROL ACTION FORECAST
ISSUED SUNDAY, MAY 20, 2007**

Three-day weather outlook:

A large trough of low pressure will bully its way into the western U.S., dropping afternoon desert temperatures into the mid to upper 90s through much of next week. Winds will become more southwesterly this week with the strongest winds expected on Monday afternoon. No rain is expected through at least next Sunday. The risk of wind-blown dust in Yuma will be “Moderate” on Monday, decreasing to “Low” by Tuesday.

	<u>WINDS</u>	<u>WIND BLOWN DUST RISK</u>
Day #1: Mon 05/21/2007	Southeast 10-20 mph are expected early, becoming south 15-25 mph by the afternoon hours.	MODERATE
Day #2: Tue 05/22/2007	South winds 10-20 mph are expected much of the day.	LOW
Day #3: Wed 05/23/2007	South winds 5-15 mph are likely early, becoming southwest 10-20 mph by the afternoon.	LOW

PM-10 & PM-2.5 (PARTICLES)

Description – The term “particulate matter” (PM) includes both solid particles and liquid droplets found in air. Many manmade and natural sources emit PM directly or emit other pollutants that react in the atmosphere to form PM. Particles less than 10 micrometers in diameter tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter are referred to as “fine” particles and are responsible for many visibility degradations (brown cloud). Particles with diameters between 2.5 and 10 micrometers are referred to as “coarse”.

Sources – Fine = All types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Coarse = crushing or grinding operations and dust from paved or unpaved roads.

Potential health impacts – PM can increase susceptibility to respiratory infections and can aggravate existing respiratory diseases, such as asthma and chronic bronchitis.

Units of measurement – Micrograms per cubic meter (ug/m3)

Averaging interval – 24 hours (midnight to midnight).

Reduction tips – Stabilize loose soils, minimize travel on dirt roads, utilize tarps on haul trucks, limit use of leaf-blowers, and on high-wind days reduce outdoor activities.

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(may be updated)
HOURLY OBSERVATIONS TABLE
YUMA MCAS (03145)
YUMA , AZ
(05/2007)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 213 ft. above sea level
Latitude: 32.650
Longitude: -114.617
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
21	0051	5	CLR	10.00		74	23.3	61	15.9	51	10.6	45	13	160		29.47			AA		29.70	
21	0151	5	CLR	10.00		73	22.8	62	16.5	54	12.2	52	13	150		29.46	6	000	AA		29.69	
21	0251	5	CLR	10.00		73	22.8	64	17.7	58	14.4	59	15	150		29.46			AA		29.69	
21	0351	5	CLR	10.00		72	22.2	65	18.1	60	15.6	66	16	150		29.46			AA		29.69	
21	0451	5	CLR	10.00		71	21.7	65	18.2	61	16.1	71	15	150		29.47	3	001	AA		29.70	
21	0551	5	CLR	10.00		71	21.7	64	17.6	59	15.0	66	16	150	22	29.47			AA		29.70	
21	0651	5	FEW200	10.00		72	22.2	63	17.2	57	13.9	59	20	140	28	29.49			AA		29.72	
21	0751	5	FEW200	7.00		75	23.9	65	18.1	58	14.4	56	25	150	31	29.49	2	008	AA		29.72	
21	0851	5	FEW200	7.00		78	25.6	66	19.0	59	15.0	52	17	160	26	29.51			AA		29.74	
21	0951	5	FEW200	8.00		81	27.2	68	20.1	61	16.1	51	18	160		29.51			AA		29.74	
21	1051	5	FEW200	6.00		85	29.4	67	19.1	55	12.8	36	22	160		29.50	0	003	AA		29.73	
21	1151	5	CLR	5.00	BLDU	87	30.6	65	18.2	50	10.0	28	21	160	30	29.49			AA		29.72	
21	1251	5	CLR	7.00		90	32.2	66	18.6	49	9.4	24	18	180		29.47			AA		29.70	
21	1351	5	CLR	7.00		91	32.8	65	18.3	47	8.3	22	23	160	31	29.45	8	019	AA		29.68	
21	1451	5	CLR	9.00		90	32.2	63	17.3	43	6.1	19	20	160	28	29.42			AA		29.65	
21	1551	5	CLR	10.00		92	33.3	64	17.6	43	6.1	18	20	170		29.41			AA		29.64	
21	1651	5	CLR	7.00		89	31.7	62	16.9	42	5.6	19	21	150	28	29.39	6	017	AA		29.62	
21	1751	5	CLR	8.00		87	30.6	63	17.3	46	7.8	24	18	180		29.38			AA		29.61	
21	1851	5	CLR	8.00		83	28.3	62	16.5	46	7.8	27	23	170	28	29.39			AA		29.62	
21	1951	5	CLR	10.00		79	26.1	62	16.4	49	9.4	35	16	160		29.41	3	007	AA		29.64	
21	2051	5	CLR	10.00		77	25.0	62	16.5	51	10.6	40	13	170		29.44			AA		29.67	
21	2151	5	CLR	10.00		75	23.9	62	16.4	52	11.1	45	14	160		29.44			AA		29.67	
21	2251	5	CLR	10.00		74	23.3	62	16.5	53	11.7	48	18	150	25	29.43	0	007	AA		29.66	
21	2351	5	CLR	10.00		73	22.8	62	16.5	54	12.2	52	18	140	28	29.44			AA		29.67	

Dynamically generated Tue Oct 30 10:05:28 EST 2007 via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
BLYTHE AIRPORT (23158)
BLYTHE , CA
(05/2007)**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: 395 ft. above sea level

Latitude: 33.619

Longitude: -114.717

Data Version: VER3

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
21	0053	12	CLR	10.00		76	24.4	56	13.6	39	3.9	26	8	180		29.27			29.67	AA		29.69
21	0153	12	CLR	10.00		74	23.3	57	13.7	42	5.6	32	13	180		29.27	5	000	29.67	AA		29.69
21	0253	12	CLR	10.00		74	23.3	58	14.4	45	7.2	36	15	190		29.27			29.67	AA		29.69
21	0353	12	CLR	10.00		72	22.2	59	15.0	49	9.4	44	7	170		29.27			29.67	AA		29.69
21	0453	12	CLR	10.00		72	22.2	59	15.0	49	9.4	44	8	180		29.28	5	000	29.68	AA		29.70
21	0553	12	CLR	10.00		75	23.9	60	15.4	48	8.9	39	15	180		29.29			29.69	AA		29.71
21	0653	12	CLR	10.00		77	25.0	61	16.0	49	9.4	37	18	180		29.31			29.71	AA		29.73
21	0753	12	CLR	10.00		81	27.2	61	16.1	46	7.8	29	18	180		29.32	2	013	29.72	AA		29.74
21	0853	12	CLR	10.00		83	28.3	61	16.1	44	6.7	25	24	170		29.31			29.70	AA		29.73
21	0953	12	CLR	10.00		85	29.4	63	17.1	47	8.3	27	16	160	25	29.31	0	000	29.71	AA		29.73
21	1053	12	CLR	10.00		87	30.6	64	18.0	49	9.4	27	14	170	24	29.30	0	000	29.70	AA		29.72
21	1153	12	CLR	10.00		89	31.7	65	18.1	48	8.9	24	15	170	24	29.27			29.67	AA		29.69
21	1253	12	CLR	9.00		92	33.3	67	19.4	51	10.6	25	17	170	24	29.24	8	023	29.64	AA		29.66
21	1353	12	CLR	8.00		93	33.9	64	18.0	44	6.7	18	20	160	26	29.22			29.62	AA		29.64
21	1453	12	CLR	7.00		93	33.9	64	18.0	44	6.7	18	21	160		29.19			29.59	AA		29.61
21	1553	12	CLR	9.00		92	33.3	64	17.8	44	6.7	19	23	170	29	29.17	8	023	29.57	AA		29.59
21	1653	12	CLR	10.00		90	32.2	64	17.6	45	7.2	21	20	170	25	29.16			29.56	AA		29.58
21	1753	12	CLR	9.00		87	30.6	62	16.9	44	6.7	22	20	170	24	29.18			29.58	AA		29.60
21	1853	12	CLR	8.00		83	28.3	61	16.3	45	7.2	26	16	180	24	29.19	3	008	29.59	AA		29.61
21	1953	12	CLR	10.00		80	26.7	61	16.1	47	8.3	31	18	180		29.21			29.61	AA		29.63
21	2053	12	CLR	10.00		78	25.6	60	15.5	46	7.8	32	21	180		29.23	3	019	29.62	AA		29.65
21	2153	12	CLR	10.00		76	24.4	61	15.8	49	9.4	39	13	180		29.25			29.65	AA		29.67
21	2253	12	CLR	10.00		74	23.3	61	15.9	51	10.6	45	11	180		29.26			29.66	AA		29.68
21	2353	12	CLR	10.00		73	22.8	60	15.7	51	10.6	46	17	190		29.26			29.66	AA		29.68

Dynamically generated Thu May 08 18:19:05 EDT 2008 via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA
(final)
HOURLY OBSERVATIONS TABLE
IMPERIAL COUNTY AIRPORT (03144)
IMPERIAL , CA
(05/2007)**

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: -59 ft. below sea level
Latitude: 32.834
Longitude: -115.579
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
21	0053	12	CLR	10.00		71	21.7	63	17.3	58	14.4	64	11	130		29.72	1	001	29.66	AA		29.66
21	0153	12	CLR	10.00		70	21.1	62	16.5	56	13.3	61	8	130		29.72			29.66	AA		29.66
21	0253	12	CLR	10.00		69	20.6	61	16.0	55	12.8	61	8	130		29.72			29.67	AA		29.66
21	0353	12	CLR	10.00		67	19.4	60	15.3	54	12.2	63	8	140		29.72	7	000	29.66	AA		29.66
21	0453	12	CLR	10.00		67	19.4	60	15.5	55	12.8	66	7	120		29.74			29.68	AA		29.68
21	0553	12	CLR	10.00		69	20.6	63	17.2	59	15.0	71	5	140		29.76			29.70	AA		29.70
21	0653	12	CLR	10.00		73	22.8	66	18.9	62	16.7	69	9	120		29.77	1	017	29.71	AA		29.71
21	0753	12	CLR	10.00		77	25.0	68	19.7	62	16.7	60	9	140		29.78			29.72	AA		29.72
21	0853	12	CLR	10.00		81	27.2	68	20.1	61	16.1	51	11	120		29.77			29.71	AA		29.71
21	0953	12	CLR	10.00		84	28.9	68	20.1	59	15.0	43	7	120		29.76	8	002	29.70	AA		29.70
21	1053	12	CLR	10.00		87	30.6	67	19.3	54	12.2	32	10	080		29.75			29.70	AA		29.69
21	1153	12	CLR	10.00		89	31.7	69	20.4	57	13.9	34	8	130	17	29.72			29.66	AA		29.66
21	1253	12	CLR	10.00		92	33.3	69	20.4	55	12.8	29	11	150	23	29.70	8	022	29.64	AA		29.64
21	1353	12	CLR	10.00		92	33.3	68	19.9	53	11.7	27	0	000		29.68			29.62	AA		29.62
21	1453	12	CLR	8.00		94	34.4	68	20.0	52	11.1	24	16	120		29.66			29.60	AA		29.60
21	1553	12	CLR	8.00		93	33.9	67	19.6	51	10.6	24	17	120		29.63	7	021	29.57	AA		29.57
21	1653	12	CLR	7.00		91	32.8	66	19.0	50	10.0	25	18	130		29.63			29.57	AA		29.57
21	1753	12	CLR	10.00		87	30.6	65	18.3	50	10.0	28	13	150		29.66			29.60	AA		29.60
21	1853	12	CLR	10.00		83	28.3	66	18.8	55	12.8	38	7	160		29.68	3	015	29.62	AA		29.62
21	1953	12	OVC055	10.00		80	26.7	65	18.2	55	12.8	42	6	170		29.70			29.64	AA		29.64
21	2053	12	OVC060	10.00		78	25.6	61	16.0	48	8.9	35	0	000		29.71			29.65	AA		29.65
21	2153	12	CLR	10.00		76	24.4	63	17.2	54	12.2	47	6	360		29.73	1	016	29.67	AA		29.67
21	2253	12	CLR	10.00		72	22.2	58	14.5	47	8.3	41	6	260		29.73			29.67	AA		29.67
21	2353	12	CLR	10.00		69	20.6	57	13.8	47	8.3	46	9	250		29.73			29.67	AA		29.67

Dynamically generated Tue Oct 30 09:53:10 EST 2007 via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>

U.S. Department of Commerce
National Oceanic & Atmospheric Administration

**QUALITY CONTROLLED LOCAL
CLIMATOLOGICAL DATA**
(may be updated)
HOURLY OBSERVATIONS TABLE
NAF (23199)
EL CENTRO , CA
(05/2007)

National Climatic Data Center
Federal Building
151 Patton Avenue
Asheville, North Carolina 28801

Elevation: -43 ft. below sea level
Latitude: 32.817
Longitude: -115.667
Data Version: VER2

Date	Time (LST)	Station Type	Sky Conditions	Visibility (SM)	Weather Type	Dry Bulb Temp		Wet Bulb Temp		Dew Point Temp		Rel Humd %	Wind Speed (MPH)	Wind Dir	Wind Gusts (MPH)	Station Pressure (in. hg)	Press Tend	Net 3-hr Chg (mb)	Sea Level Pressure (in. hg)	Report Type	Precip. Total (in)	Alti-meter (in. hg)
						(F)	(C)	(F)	(C)	(F)	(C)											
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
21	0056	5	CLR	10.00		68	20.0	62	16.4	57	13.9	68	6	120		29.71	3	001	29.71	AA		29.67
21	0156	5	CLR	10.00		67	19.4	62	16.4	58	14.4	73	9	120		29.70			29.70	AA		29.66
21	0256	5	CLR	10.00		66	18.9	60	15.6	56	13.3	70	6	120		29.71			29.71	AA		29.67
21	0356	5	CLR	10.00		64	17.8	59	14.9	55	12.8	73	0	000		29.70	6	001	29.71	AA		29.66
21	0456	5	FEW200	10.00		63	17.2	59	14.9	56	13.3	78	0	000		29.72			29.72	AA		29.68
21	0556	5	FEW200	10.00		68	20.0	62	16.7	58	14.4	71	0	000		29.74			29.75	AA		29.70
21	0656	5	CLR	10.00		73	22.8	66	18.9	62	16.7	69	3	120		29.75	1	017	29.76	AA		29.71
21	0756	5	FEW200	10.00		76	24.4	68	19.8	63	17.2	64	3	160		29.76			29.76	AA		29.72
21	0856	5	CLR	10.00		80	26.7	68	19.9	61	16.1	52	6	100		29.75			29.76	AA		29.71
21	0956	5	CLR	10.00		83	28.3	66	18.8	55	12.8	38	8	120		29.75	8	003	29.75	AA		29.71
21	1056	5	CLR	10.00		88	31.1	67	19.2	53	11.7	30	8	110		29.73			29.74	AA		29.69
21	1156	5	CLR	10.00		89	31.7	68	20.1	56	13.3	33	6	090		29.71			29.71	AA		29.67
21	1256	5	CLR	10.00		91	32.8	69	20.7	57	13.9	32	3	VR		29.68	8	022	29.68	AA		29.64
21	1356	5	CLR	10.00		92	33.3	67	19.7	52	11.1	26	3	VR		29.66			29.66	AA		29.62
21	1456	5	CLR	10.00		93	33.9	67	19.6	51	10.6	24	7	160		29.64			29.64	AA		29.60
21	1556	5	CLR	10.00		93	33.9	68	19.8	52	11.1	25	0	000		29.61	8	022	29.62	AA		29.57
21	1656	5	FEW060	9.00		90	32.2	68	19.8	54	12.2	29	14	140		29.61			29.62	AA		29.57
21	1756	5	CLR	10.00		87	30.6	65	18.0	49	9.4	27	10	240		29.65			29.65	AA		29.61
21	1856	5	CLR	10.00		82	27.8	62	16.6	47	8.3	29	9	250		29.66	3	016	29.66	AA		29.62
21	1956	5	CLR	10.00		78	25.6	61	15.8	47	8.3	34	8	260		29.68			29.68	AA		29.64
21	2056	5	CLR	10.00		76	24.4	60	15.4	47	8.3	36	10	260		29.69			29.70	AA		29.65
21	2156	5	CLR	10.00		74	23.3	59	14.9	47	8.3	38	13	260		29.70			29.71	AA		29.66
21	2256	5	CLR	10.00		72	22.2	58	14.5	47	8.3	41	15	260		29.71	1	015	29.72	AA		29.67
21	2356	5	CLR	10.00		70	21.1	57	14.1	47	8.3	44	10	260		29.71			29.72	AA		29.67

Dynamically generated Tue Oct 30 09:45:38 EST 2007 via <http://cdo.ncdc.noaa.gov/qclcd/QCLCD>