



Martin J. Chávez, Mayor



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Methodologies for Calculating Particulate Background Concentrations

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Executive Summary

Based on EPA (Environmental Protection Agency) guidance and a survey of nearby air agencies, the Division (City of Albuquerque, Air Quality Division) should use annual means, excluding exceptional natural events, as background PM₁₀ levels for both annual and 24-hour averaging periods. This approach is logical, scientific, and defensible, whereas the alternative is not.

Three years of data should be averaged in the calculation of PM₁₀ and PM_{2.5} backgrounds. Once the PM₁₀ background values have been calculated for the various monitoring sites within Bernalillo County, a GIS can be used to interpolate background values for the remainder of the county.

Particles larger than 10 microns in diameter are not monitored in New Mexico. PM₁₀ background levels should be used for the PM₁₀ portion of Total Suspended Particulate (TSP). Since gravitational forces pull particles larger than 10 microns to the ground relatively quickly, concentrations of those larger particles are only significant in the vicinity of a source and therefore must be handled by air dispersion modeling.

Per EPA guidance on ambient air monitoring and determination of attainment status, PM_{2.5} backgrounds should be calculated using Federal Reference Method (FRM) data. For PM_{2.5}, the Division should calculate and use one background value for the entire county. That value should be a 3-year mean excluding data from any exceptional events.

EPA guidance

To protect air quality in Bernalillo County, design concentrations are compared to air quality standards when a company seeks an air permit. The design concentration is the sum of modeled ambient impacts of a facility plus background pollution levels which are calculated from monitored pollution data. Calculating backgrounds for annual averaging periods is straightforward; due to the great variation in 24-hour averages of pollutant levels, it is not obvious how to calculate a background value for a 24-hour averaging period. Fortunately, EPA's Dispersion Modeling Guidelines offer guidance on calculating background values.

“The mean annual background is the average of the annual concentrations so determined at each monitor. For a 24-hour averaging period, the meteorological conditions accompanying the concentrations of concern should be identified. Concentrations for meteorological conditions of concern, at monitors not impacted by the source in question, should be averaged for each separate 24-hour period to determine the average background value.” –paraphrase of EPA Air Dispersion Modeling Guidelines¹

The “concentrations of concern” are all concentrations with the exception of those identified by EPA in its natural events policy memorandum.² In the memorandum, EPA “provides for the exclusion of certain natural source data from non-attainment determinations.” Excluded events include high wind events and smoke from wildland fires.

The Division's Quality Assurance Engineer has already flagged days³ that were influenced by exceptional events resulting in a PM₁₀ 24-hour average greater than 150 µg/m³. Those days can be left out of the calculations of a 24-hour background value and, in following EPA guidance, the Division needs to do so. The quote above from EPA's Modeling Guidelines states that the remaining concentrations (the concentrations of concern) should be averaged for each 24-hour period and then the 24-hour means should be averaged.

As further evidence that exceptional events should be excluded in the calculation of background events, consider the conclusions of the Bernalillo County PM₁₀ Emissions Inventory for 2004 completed by Desert Research Institute. The report states “the top emission source identified in the county is from wind erosion capturing 95 percent of the total PM₁₀ emissions on an annual basis.”⁴ Dave DuBois of Desert Research Institute presented the findings of the Emissions Inventory to the Division and suggested that a relatively small number of days may be contributing a disproportionately large percentage of the wind erosion emissions.⁵

The City of Albuquerque Air Quality Division monitoring network recorded at least 7 high wind events with 24-hour average PM₁₀ in excess of 150 µg/m³ in the first 6 months of 2006. The dates of those 7 events are 1/12/06, 3/10/06, 4/23/06, 5/09/06, 5/14/06, 5/22/06, and 6/06/06.⁶ If exceptional events, such as high winds, were not excluded from the determination of attainment status, Bernalillo County would be in a perpetual state of non-attainment for PM₁₀ as dust storms are frequent in New Mexico during the Spring months.

The proposed methodology of calculating background concentrations would not omit all fugitive dust pollution. Only those days when sustained wind speeds exceeded 30 MPH (or a 2 minute wind exceeded 40 MPH)⁷ and the 24-hour average exceeds 150 micrograms per cubic meter⁸ would be omitted. Since winds exceeding 20 MPH can result in respirable particles becoming airborne,⁹ a significant portion of fugitive dust pollution will remain in the data used for background calculations. Only the most extreme events would be left out of background values.

Precedent

In addition to reviewing EPA guidance, nearby air agencies were surveyed. The poll revealed 2 methodologies of calculating the background particulate levels for a 24-hour averaging period. The New Mexico Environment Department (NMED) and Nevada Department of Environmental Protection use annual means for 24-hour background values.^{10,11} NMED eliminated days with high winds from their calculations.

South Coast Air Quality Management District (SCAQMD), Colorado Department of Public Health and Environment (CDPHE), and the Texas Commission on Environmental Quality (TCEQ) use 1st or 2nd highs from monitored data.^{12,13,14} For example, SCAQMD uses the highest 24-hour PM₁₀ average over the last 3 years at the monitor nearest the source in question. CDPHE and TCEQ use the 2nd highest 24-hour PM₁₀ average as a PM₁₀ background. In addition to not following EPA guidance, there is a logical flaw in using a 1st or 2nd high 24-hour average as a background number. The CDPHE Modeling Guidelines admit this logical flaw, “The CDPHE recognizes that the chance of two independently short-term concentration maxima (background maxima and source-generated maxima) occurring simultaneously at any particular location may be low.”¹⁵

The EPA guidance quoted on page 3 directs air agencies to average 24-hour and annual means in calculating the corresponding background values. It does not state how many 24-hour means to average for the 24-hour background value, or how many annual means to average for the annual background value. Three years of data is compared to the annual PM₁₀ standard in determination of attainment status. Thus, there is a precedent for using 3 years of data. Three years is a good compromise between using the absolute most recent data and including a wide variety of meteorological conditions of concern (365 * 3 minus the exceptional events).

PM₁₀ monitoring data

There are different methods for monitoring PM₁₀ levels. The Division's monitoring network uses both Federal Reference Method (FRM) and Federal Equivalent Method (FEM) monitors.¹⁶ Per the Code of Federal Regulations, attainment status can be determined using either reference or equivalent monitoring methods/technologies.¹⁷ Since both FRM and FEM monitors are useful in the determination of attainment status, both monitoring methods could be used in the creation of background values.

TSP backgrounds

Total Suspended Particulate (TSP) is not a federal criteria pollutant and TSP levels are not monitored in New Mexico. During the 1980s and 1990s, EPA found that there was no scientific support for a TSP-based air quality standard.¹⁸ Funds for TSP monitoring vanished shortly after the national TSP air quality standards were dropped. Thus TSP levels are not monitored in New Mexico and so there is no data available for setting background levels.

There is, however, a logical work around for dealing with the lack of TSP data. Particle deposition velocities increase logarithmically with increasing particle size. In fact, particles with a diameter in excess of 10 microns typically have deposition velocities in excess of 1 cm/s¹⁹. With a deposition velocity of 1 cm/s, a particle released from a height of 3 meters will be on the ground in 300 seconds, or 5 minutes. Thus, for particles larger than 10 microns in diameter, airborne suspension times are generally on the order of minutes or hours (as opposed to days, weeks, or months). Keep in mind that natural events, such as dust storms, are not included in background values.

Due to short suspension times, airborne concentrations of large (diameter >10 microns) particles are only significant in the vicinity of a source of such particles²⁰. Ambient concentrations of large particles in the vicinity of a source are considered and weighed by air dispersion models directly. Thus large particles should not be accounted for in background values. Including large particles in a background value would be effectively double-counting them since the background value is added to the modeled impact in calculating a design concentration. Background values for TSP should therefore be limited to what is measured, i.e. particles with a diameter of 10 microns or less.

PM_{2.5} data

Bernalillo County has two FRM and four Special Purpose monitors for fine particulates (aka PM_{2.5}). EPA guidance on calculating background concentrations¹ doesn't refer to any specific pollutant. Thus the guidance applies to PM_{2.5} as well as PM₁₀. EPA has the authority to “give special consideration to data determined to be affected by an exceptional or natural event.”³ Thus exceptional natural events such as wildfires can be omitted from determination of PM_{2.5} background values.

There are six monitors for fine particulates in Bernalillo County. Two of the monitors, Southeast Heights and Del Norte, are FRM. Four of the monitors, Uptown Zuni Park, South Valley, North Valley, and Taylor Ranch, are Special Purpose Monitors (SPM). In particular, the SPMs are continuous monitors known as TEOMs. Regulations proposed by EPA strongly discourage the use of continuous PM_{2.5} monitors in determining attainment status:

“In the case of PM_{2.5} ..., many of the most useful types of monitors ... are not FRM, FEM, or ARM monitors, and therefore these monitors can be deployed for two or even more years without any concern about the use of the data in non-attainment designations. This includes ... all existing continuous monitors for PM_{2.5}.” –EPA’s Revision to Ambient Air Monitoring Regulations²¹

Volatility of aerosols and liquid water sampling are the most significant roadblocks that stand in the way of continuous PM_{2.5} monitors gaining Federal Equivalent Method status.²² Since data from SPMs/TEOMs are not to be used in designation of attainment status, it is inappropriate to use that data in calculation of background value. Thus only the FRM monitors can be used to calculate background PM_{2.5} values for the entire county. The Division needs to calculate the most recent 3-year average of the annual means at each of the FRM sites, then take the highest 3-year average as the 24-hour and annual background.

Appendix A

Date	Hour	Wind Speed	WDIR	STDPM10
1/12/2006	0	2	177	41
1/12/2006	1	4	151	46.2
1/12/2006	2	2	228	36.7
1/12/2006	3	2	0	43.7
1/12/2006	4	2	130	30.2
1/12/2006	5	2	164	66.2
1/12/2006	6	1	190	152
1/12/2006	7	1	190	166.1
1/12/2006	8	3	33	264.5
1/12/2006	9	3	334	191.4
1/12/2006	10	5	269	433.3
1/12/2006	11	19	325	719.8
1/12/2006	12	20	300	543.4
1/12/2006	13	18	295	580.8
1/12/2006	14	12	309	138.9
1/12/2006	15	11	313	104.1
1/12/2006	16	12	312	74.8
1/12/2006	17	11	331	42.5
1/12/2006	18	9	339	20
1/12/2006	19	12	6	17.6
1/12/2006	20	17	355	32.1
1/12/2006	21	9	345	13.1
1/12/2006	22	11	349	12
1/12/2006	23	6	279	10.1

24-hr
avg 157.52083

Singer Chappell
monitor

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: ALBUQUERQUE NM
 MONTH: JANUARY
 YEAR: 2006
 LATITUDE: 35 2 N
 LONGITUDE: 106 37 W

TEMPERATURE IN F:PCPN:WIND :SUNSHINE:SKY :PK WND

DY	MAX	MIN	WTR	AVG MX 2MIN			MIN	PSBL	S-S	WX	SPD	DR
				SPD	SPD	DIR						
1	56	38	0.00	14.6	31	280	542	91	4		38	280
2	58	31	0.00	4.5	13	190	536	90	5		17	180
3	60	37	0.00	10.6	31	280	474	80	5		41	280
4	58	27	0.00	9.0	23	340	593	100	2		32	350
5	51	31	0.00	5.3	14	300	566	95	0		17	300
6	55	28	0.00	3.4	8	10	572	96	1		9	10
7	56	25	0.00	6.2	17	180	517	87	5		20	180
8	58	30	0.00	5.9	13	330	563	94	3		17	260
9	44	29	0.00	8.8	22	340	587	98	1		26	330
10	48	20	0.00	3.3	10	200	598	100	0		13	220
11	52	21	0.00	4.5	10	130	599	100	0		12	130
12	52	27	0.00	12.5	33	330	510	85	4		38	320
13	52	20	0.00	4.3	13	300	601	100	0		14	300
14	52	29	0.00	5.3	12	140	434	72	7		13	120
15	58	34	0.00	11.3	31	270	509	84	6		36	280
16	42	31	0.00	10.9	22	300	499	82	5		28	310
17	48	22	0.00	6.7	18	340	602	99	0		21	330
18	50	22	0.00	6.5	18	170	548	90	4		25	160
19	57	33	0.00	12.9	33	290	383	63	5		40	290
20	43	21	0.00	6.4	22	300	544	89	2		29	290
21	43	19	0.00	6.2	14	10	560	92	4		16	350
22	47	21	0.00	7.2	20	80	576	94	3		22	50
23	48	25	0.00	6.8	13	360	615	100	1		15	350
24	52	24	0.00	9.9	21	100	470	76	6		24	100
25	47	32	0.04	10.9	21	100	0	0	9	1	24	100
26	49	31	T	5.9	18	170	562	90	5		22	180
27	52	26	0.00	7.0	17	280	455	73	5		20	270
28	45	29	0.00	9.4	23	330	529	85	5		29	350
29	53	24	0.00	6.5	26	320	525	84	5		32	320
30	53	30	0.00	6.0	12	300	626	100	2		16	310
31	61	30	0.00	6.8	17	340	511	81	3		21	340

Date	Hour	Wind Speed	WDIR	STDPM10
3/10/2006	0	6	144	8.1
3/10/2006	1	4	169	9.2
3/10/2006	2	3	205	15.7
3/10/2006	3	4	192	18.3
3/10/2006	4	5	154	14.9
3/10/2006	5	5	172	32
3/10/2006	6	9	165	23.5
3/10/2006	7	11	189	32.4
3/10/2006	8	10	188	39.5
3/10/2006	9	12	192	38
3/10/2006	10	13	195	98.6
3/10/2006	11	21	198	491.5
3/10/2006	12	25	225	1305.1
3/10/2006	13	24	250	550.9
3/10/2006	14	23	263	412.1
3/10/2006	15	21	264	485.2
3/10/2006	16	23	233	610.1
3/10/2006	17	21	241	272.4
3/10/2006	18	18	263	136.5
3/10/2006	19	15	264	38.7
3/10/2006	20	11	237	22.2
3/10/2006	21	9	243	24.5
3/10/2006	22	8	253	22.8
3/10/2006	23	4	236	21.1

24-hr
avg 196.80417

Singer Chappell
monitor

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: ALBUQUERQUE NM
 MONTH: MARCH
 YEAR: 2006
 LATITUDE: 35 2 N
 LONGITUDE: 106 37 W

TEMPERATURE IN F:PCPN:WIND :SUNSHINE: SKY :PK WND

AVG MX 2MIN

DY MAX MIN WTR SPD SPD DIR MIN PSBL S-S WX SPD DR

1	64	50	0.01	8.2	23	290	472	69	8	25	290
2	65	40	T	7.9	25	90	655	95	5	31	80
3	69	44	T	16.4	31	90	596	86	7	36	90
4	68	41	0.00	7.8	24	290	559	81	6	30	290
5	67	34	0.00	3.3	10	200	662	95	4	13	200
6	73	39	0.00	5.7	17	200	622	89	6	20	190
7	63	45	0.00	12.5	25	280	641	91	7	29	280
8	53	40	T	16.9	36	260	554	79	6	44	270
9	47	30	0.00	10.5	24	280	376	53	8	28	260
10	57	37	0.00	15.8	40	240	588	83	7 8	49	260
11	55	30	0.00	12.6	36	230	614	87	6	44	200
12	39	28	0.10	17.4	40	280	561	79	6 12	54	260
13	44	18	0.00	8.4	20	300	712	100	2	25	310
14	56	26	0.00	4.8	13	200	659	92	3	15	200
15	66	40	0.00	12.4	37	300	634	88	5	43	300
16	64	29	0.00	5.7	14	180	654	91	5	16	180
17	66	49	0.00	12.1	26	180	554	77	8	32	200
18	65	45	0.00	14.8	36	190	496	72	7 8	47	190
19	49	33	0.01	7.5	23	320	450	62	8 1	33	230
20	52	29	0.00	12.2	30	300	684	95	6	35	290
21	58	28	0.00	11.3	39	90	626	85	5	44	80
22	42	30	0.02	13.9	41	90	282	38	8 128	47	90
23	55	31	0.00	5.3	10	210	676	92	4	14	210
24	61	33	0.00	6.0	13	210	669	91	3	15	210
25	68	40	0.00	6.4	15	230	633	85	6	18	230
26	70	49	0.00	11.9	26	310	672	91	8	33	300
27	64	37	T	7.3	25	160	503	67	9	35	230
28	64	45	T	8.1	23	170	522	70	9	26	170
29	70	41	0.00	15.3	36	190	605	81	6	44	190
30	59	41	0.00	11.5	25	310	651	87	7	31	320
31	70	37	0.00	8.2	21	180	696	93	6	24	180

Date	Hour	Wind Speed	WDIR	STDPM10
4/23/2006	0	3	127	19.4
4/23/2006	1	1	348	37.7
4/23/2006	2	1	70	38.6
4/23/2006	3	1	171	26
4/23/2006	4	0	24	29
4/23/2006	5	1	124	34.7
4/23/2006	6	2	355	56.6
4/23/2006	7	2	342	41.5
4/23/2006	8	1	278	35.1
4/23/2006	9	4	241	29.9
4/23/2006	10	12	178	118
4/23/2006	11	17	178	463.8
4/23/2006	12	22	177	598.5
4/23/2006	13	21	181	465.2
4/23/2006	14	22	175	522.5
4/23/2006	15	21	169	488
4/23/2006	16	21	173	408.3
4/23/2006	17	20	177	162.9
4/23/2006	18	15	187	75.6
4/23/2006	19	11	178	38.9
4/23/2006	20	7	192	35.1
4/23/2006	21	5	158	34.4
4/23/2006	22	4	190	37.3
4/23/2006	23	3	61	41.3

24-hr avg 159.92917

South Valley
monitor

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: ALBUQUERQUE NM
 MONTH: APRIL
 YEAR: 2006
 LATITUDE: 35 2 N
 LONGITUDE: 106 37 W

TEMPERATURE IN F:PCPN:WIND :SUNSHINE: SKY :PK WND

DY	MAX	MIN	WTR	AVG MX 2MIN			MIN	PSBL	S-S	WX	:PK WND	
				SPD	SPD	DIR					SPD	DR
1	63	47	T	9.0	25	300	755	70	7		29	290
2	67	39	0.00	8.7	22	320	711	94	3		29	320
3	71	44	0.00	12.0	29	90	679	89	6		33	80
4	75	51	0.00	7.9	28	260	562	73	8		37	260
5	73	49	T	12.8	41	240	675	88	6		48	240
6	58	37	T	16.8	35	300	632	83	6		40	310
7	69	44	0.00	12.0	30	90	739	96	2		36	110
8	72	43	0.00	8.1	24	70	769	100	0		26	70
9	78	44	0.00	9.3	25	190	682	88	4		30	190
10	76	49	0.00	11.8	28	230	589	76	8		32	230
11	73	51	0.00	12.4	26	190	728	94	4		31	190
12	79	48	0.00	4.6	12	250	765	98	0		16	210
13	82	50	T	8.3	25	200	721	92	5	8	32	230
14	78	53	0.00	11.7	29	180	541	69	9		33	170
15	74	52	0.00	13.4	38	230	785	100	0	78	46	230
16	78	44	0.00	6.5	20	280	787	100	0		23	280
17	80	49	0.00	12.3	31	250	764	97	0		39	250
18	64	44	0.00	13.9	23	350	791	100	0		29	340
19	72	40	0.00	6.2	15	10	793	100	0		18	350
20	75	48	0.00	9.3	21	330	757	95	3		26	290
21	75	45	0.00	4.9	12	90	764	96	5		15	170
22	84	54	0.00	8.0	28	170	585	73	8		33	180
23	83	55	0.00	14.2	37	170	736	92	5		45	180
24	73	51	0.00	10.1	31	280	803	100	1		38	290
25	73	46	0.00	10.2	29	90	749	93	2		35	90
26	77	47	0.00	10.4	31	80	807	100	2		36	90
27	80	52	0.00	10.8	30	190	711	87	5		36	190
28	70	47	T	16.5	31	110	74	74	7		37	90
29	69	41	0.13	8.7	22	80	724	89	5	1	25	100
30	80	43	0.00	9.1	23	320	720	88	3		30	290

Date	Hour	Wind Speed	WDIR	STDPM10
5/9/2006	0	14	268	77.5
5/9/2006	1	9	249	19.6
5/9/2006	2	5	221	18.2
5/9/2006	3	3	162	17.3
5/9/2006	4	3	61	27.5
5/9/2006	5	4	101	27.6
5/9/2006	6	3	146	39.5
5/9/2006	7	3	183	49
5/9/2006	8	4	166	26.9
5/9/2006	9	5	168	23.8
5/9/2006	10	6	123	18.9
5/9/2006	11	9	154	37.8
5/9/2006	12	14	238	198.8
5/9/2006	13	16	243	234.3
5/9/2006	14	16	256	558.7
5/9/2006	15	19	305	701.5
5/9/2006	16	25	342	1615
5/9/2006	17	32	337	2339.1
5/9/2006	18	20	359	1184.9
5/9/2006	19	17	352	50.8
5/9/2006	20	16	348	36.2
5/9/2006	21	13	346	14.6
5/9/2006	22	12	340	13.1
5/9/2006	23	6	349	7.8

24-hr
avg 305.76667

Singer Chappell
monitor

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: ALBUQUERQUE NM
 MONTH: MAY
 YEAR: 2006
 LATITUDE: 35 2 N
 LONGITUDE: 106 37 W

TEMPERATURE IN F:PCPN:WIND :SUNSHINE: SKY :PK WND

DY	MAX	MIN	WTR	AVG MX 2MIN			MIN	PSBL	S-S	WX	SPD	DR
				SPD	SPD	DIR						
1	79	56	0.00	6.0	16	250	715	88	5		18	220
2	84	55	0.00	6.5	23	280	754	92	6		28	280
3	81	58	0.00	7.9	23	140	714	87	7		31	130
4	80	57	0.00	10.6	31	200	712	86	6		44	200
5	75	52	T	11.5	35	90	678	82	6	378	43	90
6	76	48	0.00	8.5	18	100	788	95	3	3	21	100
7	79	50	0.00	6.0	23	260	717	87	4		30	260
8	84	48	0.00	12.6	29	280	764	92	2		36	290
9	83	53	0.00	16.3	44	340	742	89	3	78	60	340
10	75	46	0.00	12.1	28	90	832	100	1		32	90
11	77	50	0.00	9.5	29	90	775	93	6		36	100
12	86	54	0.00	5.5	16	240	827	99	3		22	240
13	88	54	0.00	5.6	15	270	737	88	7		20	250
14	87	60	T	22.7	45	80	774	92	6		52	80
15	72	55	T	17.0	32	90	582	69	7		38	90
16	81	52	0.00	8.2	35	90	783	93	3		39	90
17	83	56	T	6.1	33	10	729	86	4		44	360
18	89	61	0.00	6.2	32	240	779	92	5		44	190
19	90	59	0.00	8.0	25	40	785	93	5		40	20
20	91	63	0.00	6.1	18	290	773	91	4		22	290
21	90	62	0.00	8.3	20	240	773	90	5		22	230
22	91	68	0.00	17.8	44	180	681	80	6	7	51	200
23	85	57	0.00	8.8	17	340	852	100	0		20	20
24	89	56	0.00	5.7	15	30	853	100	1		20	40
25	92	57	0.00	10.2	24	170	824	96	2		29	180
26	90	59	0.00	9.3	25	170	839	98	2		30	170
27	86	58	0.00	12.1	30	190	836	98	4		36	200
28	85	61	0.00	12.7	28	290	838	98	4		33	220
29	82	56	0.00	8.1	18	320	806	94	3		23	310
30	86	55	0.00	6.2	22	190	837	97	2		28	190
31	86	63	0.00	16.8	40	80	825	96	2	78	48	80

Date	Hour	Wind Speed	WDIR	STDPM10
5/14/2006	0	6	75	48.4
5/14/2006	1	15	85	303.2
5/14/2006	2	17	82	278.7
5/14/2006	3	16	82	96.3
5/14/2006	4	13	88	40.6
5/14/2006	5	11	86	33.4
5/14/2006	6	10	92	33.7
5/14/2006	7	8	59	37.8
5/14/2006	8	9	77	35.4
5/14/2006	9	10	107	32.5
5/14/2006	10	8	144	33.2
5/14/2006	11	9	112	36.7
5/14/2006	12	7	166	25.2
5/14/2006	13	6	185	24.8
5/14/2006	14	6	253	18.6
5/14/2006	15	12	105	438.8
5/14/2006	16	25	79	1805
5/14/2006	17	22	87	648.2
5/14/2006	18	22	90	353.7
5/14/2006	19	22	89	385.7
5/14/2006	20	22	84	529.3
5/14/2006	21	22	86	295.3
5/14/2006	22	19	90	124.6
5/14/2006	23	19	84	70.7

24-hr
avg 238.74167

South Valley
monitor

Date	Hour	Wind Speed	WDIR	STDPM10
5/22/2006	0	1	300	35.2
5/22/2006	1	3	125	29.2
5/22/2006	2	1	321	36.9
5/22/2006	3	2	19	37.5
5/22/2006	4	3	6	48.6
5/22/2006	5	4	350	54.6
5/22/2006	6	4	357	56.3
5/22/2006	7	4	346	56
5/22/2006	8	3	332	52.4
5/22/2006	9	2	302	39
5/22/2006	10	5	213	46.9
5/22/2006	11	3	241	36.4
5/22/2006	12	8	143	146
5/22/2006	13	17	171	374.4
5/22/2006	14	20	172	543.6
5/22/2006	15	23	166	611.9
5/22/2006	16	22	178	583.9
5/22/2006	17	21	173	456.4
5/22/2006	18	16	190	332.3
5/22/2006	19	10	203	86
5/22/2006	20	12	225	72.3
5/22/2006	21	11	234	63.3
5/22/2006	22	8	234	49.4
5/22/2006	23	6	240	29.6

24-hr avg 161.5875

North Valley
monitor

Date	Hour	Wind speed	WDIR	STDPM10
6/6/2006	0	2	350	41
6/6/2006	1	1	193	36.5
6/6/2006	2	2	336	78.3
6/6/2006	3	2	14	30.8
6/6/2006	4	2	231	31
6/6/2006	5	8	106	114.6
6/6/2006	6	13	81	139.2
6/6/2006	7	13	82	101.8
6/6/2006	8	10	93	35.9
6/6/2006	9	7	103	30.4
6/6/2006	10	7	200	M
6/6/2006	11	7	222	M
6/6/2006	12	9	213	M
6/6/2006	13	5	234	44.4
6/6/2006	14	15	112	1030
6/6/2006	15	12	57	480.7
6/6/2006	16	8	56	55.4
6/6/2006	17	12	36	107.7
6/6/2006	18	15	10	547.9
6/6/2006	19	11	27	52.4
6/6/2006	20	6	7	37.7
6/6/2006	21	11	77	107.4
6/6/2006	22	20	70	1015.3
6/6/2006	23	21	82	472.1

24-hr avg 218.59524

South Valley
monitor

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

STATION: ALBUQUERQUE NM
 MONTH: JUNE
 YEAR: 2006
 LATITUDE: 35 2 N
 LONGITUDE: 106 37 W

TEMPERATURE IN F:PCPN:WIND :SUNSHINE: SKY :PK WND

DY	MAX	MIN	WTR	AVG MX 2MIN			MIN	PSBL	S-S	WX	SPD	DR
				SPD	SPD	DIR						
1	85	65	0.00	13.8	29	90	716	83	5		33	110
2	91	66	0.00	8.9	30	130	724	84	5		33	140
3	93	66	0.00	6.2	23	180	817	95	4		26	180
4	96	67	0.00	5.3	17	280	818	95	3		22	270
5	98	67	0.00	5.4	14	150	828	96	2		16	50
6	96	71	T	14.7	43	70	539	62	5	37	61	60
7	91	74	0.02	17.0	38	150	732	84	6	38	47	150
8	86	64	0.02	10.3	31	110	623	72	7		41	230
9	86	61	0.07	7.8	30	160	682	79	6	38	38	150
10	91	61	0.00	5.3	22	280	847	98	3		25	280
11	92	63	0.00	7.2	18	240	818	94	3		24	190
12	95	64	0.00	7.2	17	200	836	96	3		23	230
13	97	70	0.00	7.0	17	220	807	93	4		21	190
14	95	70	T	8.3	31	170	798	92	7		41	150
15	94	74	0.00	13.9	36	220	630	72	8	8	43	210
16	84	64	0.00	12.8	26	310	848	97	5		35	300
17	91	57	0.00	6.6	18	310	871	100	0		21	330
18	95	63	0.00	4.8	14	230	871	100	1		21	200
19	98	65	0.00	9.7	31	180	825	95	2		38	190
20	96	69	0.00	10.4	29	190	820	94	4		36	190
21	96	64	0.00	5.7	21	190	853	98	4		24	190
22	92	69	0.00	17.8	38	90	840	96	4	8	44	90
23	91	65	T	10.6	37	90	826	95	3	37	43	90
24	96	66	0.00	13.7	35	80	825	95	6	7	40	80
25	87	63	T	18.8	41	270	719	83	6	378	48	80
26	83	57	0.03	14.2	47	20	715	82	6	3	55	20
27	81	56	0.26	7.5	36	80	733	84	6	3	40	80
28	85	59	0.00	7.2	23	80	795	91	5		26	80
29	88	64	0.74	5.4	31	110	M	M	4	3	39	120
30	89	65	0.00	5.4	15	230	766	88	5		17	240

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