

**Albuquerque Environmental Health Department (EHD)
Air Quality Division (AQD)
Ambient Air Monitoring Section
Annual Network Review for Ambient Air Monitoring**

Under 40 CFR, Part 58, Subpart B, AQD is required to submit an annual monitoring network review to the Environmental Protection Agency (EPA) regional office in Dallas, Texas. The network plan describes the framework of the local air quality surveillance system, presents monitoring results over the past three years, provides comparisons to national standards, and discusses future plans. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA.

The following document represents the current network plan and proposed changes to the AQD Air monitoring network for Fiscal Year 2008. These proposed changes incorporate new rules requirements from CFR 40 parts 53 & 58 that were published October 17, 2006 and became effective December 18, 2006. This document represents the commitment of the AQD to effectively protect the health of the citizens of Albuquerque-Bernalillo County through ambient air monitoring, by using the best affordable technology, and by communicating the data collected as quickly and accurately as possible.

The map in Figure 1 shows the physical location of all current monitoring sites currently operated by the Air Quality Division. Site designation corresponds to column 2 in Table 1, which lists the ambient air monitoring sites and monitoring equipment operated at each site. Column 1 is the "AQS Site ID#," a unique identification number assigned to each monitoring site in the network. The AQS (Air Quality System) is a national air monitoring database maintained by the EPA. Data collected from monitoring sites are input into the AQS database and made available to the public within 90 days following the end of each calendar quarter as required in the new monitoring regulations. Column 2 gives the local site designation, name, and location. Site Longitude and latitude are in columns 3 and 4. Columns 5 through 9 list the monitors at each site and their associated parameters.

All AQD sites and monitors conform to 40 CFR, Subchapter C, Part 58 Appendix A (see Precision/Accuracy report at <http://www.cabq.gov/airquality/>), Appendix C (see methods in Table 1, column 7 of this document), and Appendices D & E. Site photographs accompany the hard-copy version of this report on CD. During the public review period monitoring site photographs can be downloaded from the City of Albuquerque – Air Quality Division website <http://www.cabq.gov/airquality/>

Population Statistics

Albuquerque/Bernalillo County, including Rio Rancho and Los Lunas is the State's largest Metropolitan Statistical Area (MSA). According to 2005 U.S. Census Bureau estimates the metropolitan statistical area (MSA) population is approximately 750,000 and is rapidly growing. The communities of Bernalillo, Bosque Farms, Belen, and Moriarty in adjacent counties are also growing rapidly. As the regional center for

employment, advanced education, retail commerce, and medical treatment, Albuquerque experiences extensive commuter traffic.

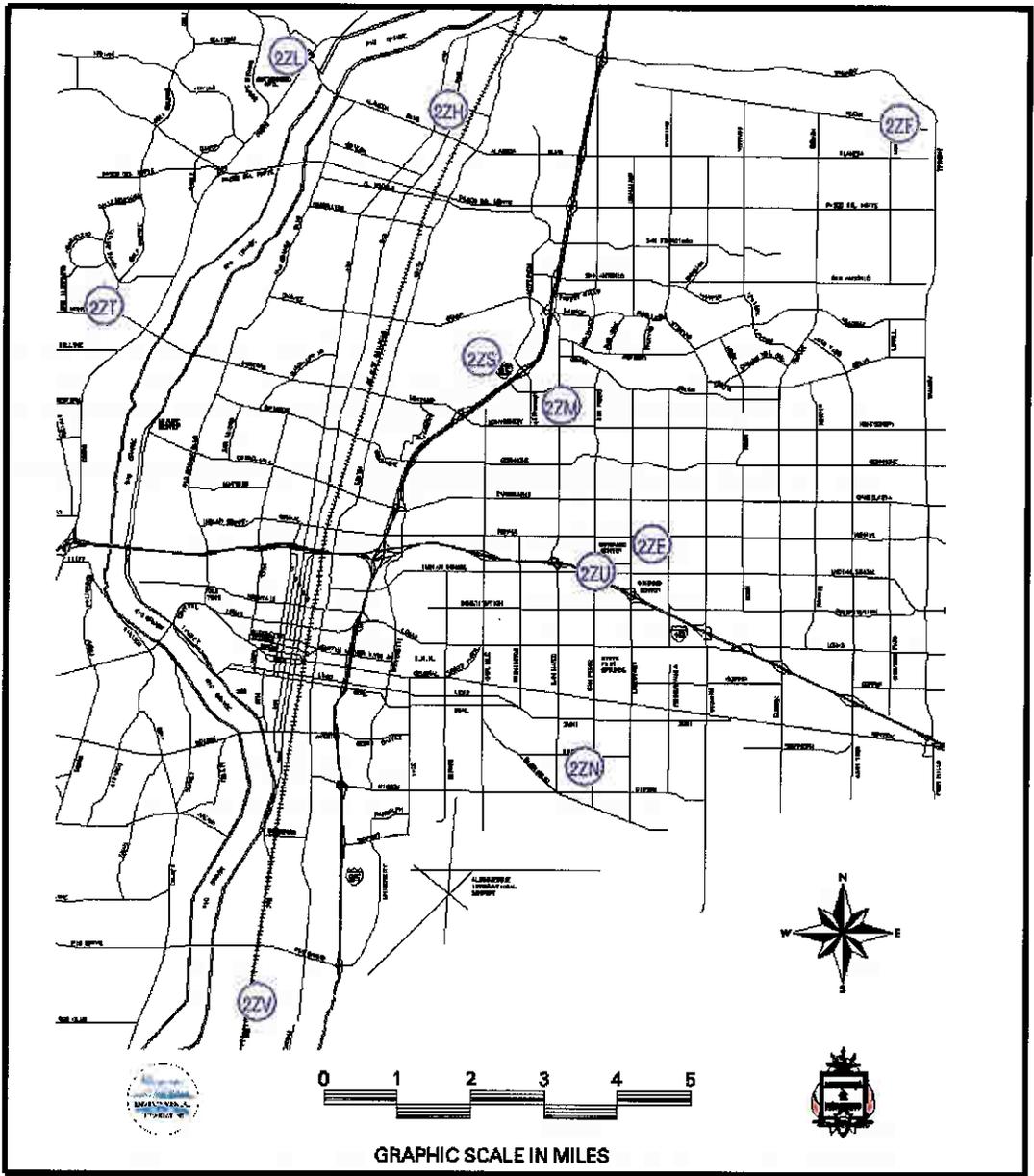


Figure 1: Albuquerque Ambient Air Quality Monitoring Network, May, 2007

Table 1 Albuquerque Ambient Air Monitoring Network

AQS Site ID#	Address/Location	Latitude	Longitude	Pollutants Measured	Station Type	Sampling Method	Analysis	Operating Schedule	Monitoring Objective	Spatial Scale	NAAQS Comparable	MSA
35-001-0019	22V Uptown-Zuni 2421 Mesilla Ave. N. E.	-106.564	35.10728	O3	SLAMS	44201-1	UV photo-metric.	continuous	Population Exposure	Neighbor hood	Yes	Abq.
				CO	SLAMS	42101-1	Non-dispersive IR	continuous seasonal	Population Exposure	Neighbor hood	Yes	Abq.
				PM10	SLAMS	81102-3	TEOM	continuous	Population Exposure	Neighbor hood	No	Abq.
				PM2.5	SLAMS	88101-3	TEOM	continuous	Population Exposure	Neighbor hood	No	Abq.
35-001-1012	22F Double Eagle Elementary 8901 Lowel NE	-106.508	35.1852	O3	SLAMS	44201-1	UV photo-metric.	continuous	Highest Concentration	Urban	Yes	Abq.
35-001-1013	22H North Valley 9819a Second Street Nw	-106.614	35.19324	O3	SLAMS	44201-1	UV photo-metric.	continuous	Population Exposure	Neighbor hood	Yes	Abq.
				PM10	SLAMS	81102-3	TEOM	continuous	Population Exposure	Neighbor hood	No	Abq.
				PM2.5	SLAMS	88101-3	TEOM	continuous	Population Exposure	Neighbor hood	No	Abq.
35-001-1014	22L Corrales 10155 Coors Road Nw	106.649	35.2022	O3	SLAMS	44201-1	UV photo-metric.	continuous	Population Exposure	Neighbor hood	Yes	Abq.
				CO	SLAMS	42101-1	Non-dispersive IR	continuous seasonal	Population Exposure	Neighbor hood	Yes	Abq.
				PM10	SLAMS	81102-1	Gravi-metric	Daily 1/1	Population Exposure	Neighbor hood	Yes	Abq.
				PM10 collocated	SLAMS	81102-2	Gravi-metric	Daily 1/6	Population Exposure	Neighbor hood	Yes	Abq.
35-001-0023-NCORE	22M Del Norte 4700a San Mateo Ne	106.586	35.13426	O3	SLAMS	44201-1	UV photo-metric.	continuous	Population Exposure	Neighbor hood	Yes	Abq.
				CO	SLAMS	42101-1	Non-dispersive IR	continuous seasonal	Population Exposure	Neighbor hood	Yes	Abq.
				NO2	SLAMS	42602-1	Chemluminescence	continuous	Population Exposure	Neighbor hood	Yes	Abq.
				PM10	SLAMS	81102-1	Gravi-metric	Daily 1/6	Population Exposure	Neighbor hood	Yes	Abq.
				PM2.5	SLAMS	68101-1	Sequential	Daily 1/1	Population Exposure	Neighbor hood	Yes	Abq.
				PM2.5 collocated	SLAMS	68101-2	Sequential	Daily 1/6	Population Exposure	Neighbor hood/urban	Yes	Abq.
				Speciation	SLAMS	68103		Daily 1/6	Special Study	NA	NA	Abq.
				Visibility	SLAMS	63101	011	continuous	Special Study	NA	NA	Abq.
EC/OC	SLAMS	88313	866	continuous	Special Study	NA	NA	Abq.				

AQS Site ID #	Address/ Location	Latitude	Longitude	Pollutants Measured	Station Type	Sampling Method	Analysis	Operating Schedule	Monitoring Objective	Spatial Scale	NAAQS Comparable	MSA	
35-001-0024	2ZN SE Heights 6000 Anderson Avenue Se	106.579	35.0631	O3	SLAMS	44201-1	UV photo-metric.	continuous	Population Exposure	Neighbor hood	Yes	Abq.	
				CO	SLAMS	42101-1	Non-dispersive IR	continuous seasonal	Population Exposure	Neighbor hood	Yes	Abq.	
				NO2	SLAMS	42602-1	Chemiluminescence	continuous	Population Exposure	Neighbor hood	Yes	Abq.	
				PM2.5	SLAMS	88101-1	Sequential	Daily 1/1	Population Exposure	Neighbor hood	Yes	Abq.	
35-001-0026	2ZS Singer 3700 Singer	106.605	35.1443	PM10	SLAMS	81102-3	TEOM	continuous	Highest Concentration	Neighbor hood/ Source-specific	No	Abq.	
				PM10	SLAMS	81102-1	Gravimetric	Daily 1/1	Highest Concentration	Neighbor hood/ Source-specific	Yes	Abq.	
				PM10 collocated	SLAMS	81102-2	Gravimetric	Daily 1/6	Highest Concentration	Neighbor hood/ Source-specific	Yes	Abq.	
35-001-0027	2ZT Taylor Ranch 5100 Montano Blvd Nw	106.697	35.1539	O3	SLAMS	44201-1	UV photo-metric.	continuous	Population Exposure	Neighbor hood	Yes	Abq.	
				PM2.5	Special Purpose	88101-3	TEOM	continuous	Population Exposure	Neighbor hood	No	Abq.	
35-001-0028	2ZU San Pedro 2200 San Pedro Ne	106.577	35.10263	CO	SLAMS	42101-1	Non-dispersive IR	continuous seasonal	Highest Concentration	Microscale	Yes	Abq.	
				PM10	SLAMS	81102-1	Gravimetric	Daily 1/6	Population Exposure	Population Exposure	Neighbor hood	Yes	Abq.
35-001-0029	2ZV South Valley 201 Prosperity Sw	106.657	35.01708	O3	SLAMS	44201-1	UV photo-metric.	continuous	Population Exposure	Regional Scale	Yes	Abq.	
				CO	SLAMS	42101-1	Non-dispersive IR	continuous seasonal	Population Exposure	Population Exposure	Regional Scale	Yes	Abq.
				PM10	SLAMS	81102-3	TEOM	continuous	Regional Transport	Other	Other	No	Abq.
				PM2.5	SLAMS	88101-3	TEOM	continuous	Other	Other	Other	No	Abq.
				EC/OC	SLAMS	88313	866	continuous	Population Exposure	Neighbor hood	NA	Abq.	

Ozone

Based on population, Table D-2 of Appendix D to Part 58, 40 CFR specifies a minimum of two (2) SLAMS (State and Local Air Monitoring Stations) ozone monitors. Currently the AQD exceeds the minimum requirements with eight (8) ozone monitors. All eight monitors are categorized as SLAMS. The MSA experiences high levels of Ozone during the summer and AQD thinks the current network is necessary to understand formation, transport, and to assess population exposure. No additional monitors are planned at this time; however we intend to pursue studies of Ozone precursors.

PM2.5

According to Table D-5 of Appendix D to Part 58, 40 CFR two SLAMS PM2.5 monitors are required in Albuquerque.

AQD currently operates six PM2.5 monitoring sites (Table 2) in Albuquerque-Bernalillo County with a total of seven (7) SLAMS monitors. Two sites (35-001-0023 and 35-001-0024) operate sequential samplers with 2.5 inlet cutoff to record hourly PM averages. One site (35-001-0023) has a collocated sequential sampler. These monitors are Federal Equivalent Methods and are comparable to the NAAQS.

Four sites monitor PM2.5 continuously using a 2.5-inlet FDMS in series with a TEOM. Because this method is not a Federal Equivalent Method (FEM), the data from these monitors are not comparable to the NAAQS.

We are not currently requesting any changes to the existing PM2.5 sites; however, site 35-001-0029 does not meet siting criteria for PM. The site is currently involved in a toxics monitoring project, but we anticipate relocating it when the special project ends in 2009. The site will hopefully remain within the current neighborhood but with improved siting criteria so the data is more useful.

A potential long range plan would add a new PM monitoring site on a high ridge at the western edge of the city. The ridge consists of sand and fine siltaceous PM transported from the Rio Puerco in past centuries. As urban development moves Westward vegetation is removed and the stable surface is disturbed. Once exposed to the wind, high PM levels are likely to occur.

We will request approval for these moves and additions if-and-when suitable new sites are located. Our three (3) highest concentration sites will remain at the existing sampling frequencies.

Table 2: AQD PM_{2.5} Monitoring Sites

PM _{2.5} FRM Sites	Current Sampling schedule	Proposed Sampling Schedule	TEOM PM _{2.5} Sites	2003 Daily 98th %	2004 Daily 98th %	2005 Daily 98th %	Design Value (% Daily NAAQS)	2003 Annual Arithmetic Mean	2004 Annual Arithmetic Mean	2005 Annual Arithmetic Mean	Design Value (% Annual NAAQS)	Co-located with continuous PM _{2.5} Sample Yes or No
Del Norte 0023	1/1	1/1	sequen- tial	16	19	19	51%	6.9	6.6	7.0	46%	No
Del Norte 0023 co-locate	1/6	1/6	sequen- tial	18	15	21	51%	6.5	7.5	7.0	47%	No
SE Heights 0024	1/1	1/1	Seque- ntial	16	21	15	50%	6.9	8.0	6.2	47%	No
Uptown-Zuni 0019	Continuous	Continuous	0019	12	22	19	50%	4.8	7.1	7.8	44%	
North Valley 1013	Continuous	Continuous	1013	22	17	20	56%	10.6	9.6	8.6	64%	
Taylor Ranch 0027	Continuous	Continuous	0027	19	10	14	41%	7.9	4.3	5.1	38%	
*South Valley 0029	Continuous	Continuous	0029	33	31	31	90%	14.1	8.9	9.6	72%	

*Site 35-001-0029 meets siting criteria for Ozone and CO but does not meet siting criteria for PM_{2.5}.

The four continuous sites in Table 3 are used for daily Air Quality Index (AQI) reporting. The monitors at these locations report hourly averages that are sent to EPA's AIRNOW web page for real-time Air Quality particulate mapping. No changes in number or location are currently being requested for these sites. However, as noted above, there are long-range plans to relocate 35-001-0029 to achieve better siting criteria.

Table 3: AQD Continuous PM_{2.5} Sites

Continuous PM _{2.5} AQI sites	Current Sampling Frequency	AQS #	Proposed Sampling Frequency
Uptown-Zuni 0019	Hourly	35-001-0019	Hourly
North Valley 1013	Hourly	35-001-1013	Hourly
Taylor Ranch 0027	Hourly	35-001-0027	Hourly
*South Valley 0029	Hourly	35-001-0029	Hourly

*Site 35-001-0029 does not meet siting criteria for PM_{2.5}.

PM10

Based on population, 40CFR, Part 58, Table D-4 of Appendix D specifies one-to-two sites as the minimum requirement for low concentration MSA's.

The AQD is currently exceeds the requirement by monitoring PM₁₀ at seven sites listed in Table 4. Four sites have continuous monitors (TEOMs) and four sites use filters to produce 24-hour averages. One of the filter-based sites has a collocated sampler.

Because of terrain, extremely dry climate, and unusual weather patterns, Albuquerque frequently has very different wind conditions in various parts of the city. Westerly winds are the assumed weather pattern but that is only true during certain seasons of the year. (see Figure 2) East canyon winds accelerate down-slope on the Sandia Mountain at speeds up to 65 miles per hour, blasting the NE quadrant of the city before slowing and dispersing. The valley experiences North-South flow with a diurnal pattern. The west side of the city has very fine soils and native vegetation is being removed for development. This results in high PM levels with any wind direction.

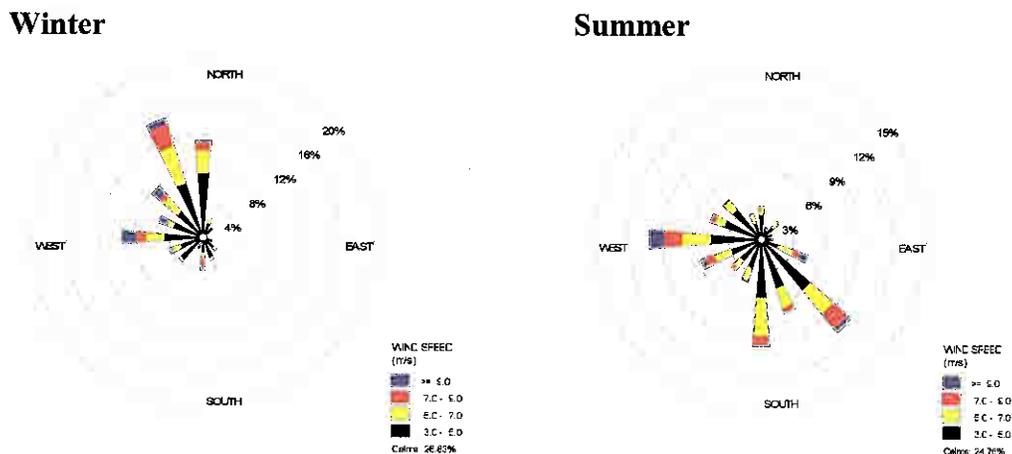


Figure 2: 2004 Seasonal Wind Roses for Albuquerque

Most of our AQI days result from high PM₁₀ values. The AQD feels that the current network is necessary to accurately portray PM in neighborhoods and issue warnings to protect the population.

With permission from Region VI, one PM₁₀ monitor (site 35-001-0019) will be combined with an FDMS for a 1-year special study. Since the combination is not an FEM, that monitor will be reclassified as a Special Purpose monitor for the duration of the study.

Long range plans include a moving Airs site 35-001-1014 which consistently produces low PM readings. The site was established during a time of major commercial development which is now complete, leaving minimal exposed surface area. With conditions stabilized, the area can be effectively monitored by AIRS site 35-001-1013.

The relocated site would follow urban development further West within the same quadrant of the city, where higher PM is more likely to occur.

Table 4. PM₁₀ Monitoring Sites

PM ₁₀ Sites	Current Sampling Schedule	2003 Annual Max Conc.	2004 Annual Max Conc.	2005 Annual Max Conc.	3 year avg. PM ₁₀ Conc.	2003-5 Percent of standard	Proposed Sampling Schedule
Uptown-Zuni 0019	Continuous	25	22	20	22	15%	Continuous
North Valley 1013	Continuous	35	31	31	32	22%	Continuous
Corrales 1014	1/6	27	21	24	24	16%	1/6
Del Norte 0023	1/6	29	17	21	22	15%	1/6
Singer - 0026	1/6	41	35	39	38	26%	1/6
Singer - 0026 colocate	1/6	36	41	39	39	26%	1/6
Uptown San Pedro - 0028	1/6	24	20	23	22	15%	1/6
*South Valley 0029	Continuous	42	35	36	38	25%	Continuous

*Site 35-001-0029 does not meet siting criteria for PM.

Sulfur Dioxide (SO₂), Nitrogen Oxides (NO₂, NO_y), and Carbon Monoxide (CO)

Under 40 CFR part 58, appendix D 4, there are no minimum requirements for the number of SO₂, NO₂, or CO sites, however, discontinuation of existing sites must be approved by the EPA Regional Administrator.

SO₂ – The AQD currently does not monitor SO₂. While there are large sources in the state, none are close to Albuquerque and emissions are reduced over distance by dispersion. The AQD will install an SO₂ monitor at AIRs site 35-001-0023 in the coming year to meet NCORE requirement.

NO₂, NO_y –The AQD monitors NO, NO₂ and NO_x at two sites. One of these (AIRS 35-001-0023) is the NCORE location. There are no large industrial point sources for NO_x in our jurisdiction, yet significant Ozone formation occurs in summer months, and studies indicate that the area is probably VOC limited. Suspected NO_x sources include mobile (both on and off road), the Airport, and methane combustion for residential and water heating.

In the past NO_y was tried at a third site on an experimental basis but the activity was discontinued at the end of the project. A NO_y monitor will be installed at the NCORE site by late 2008 or early 2009. No network changes in NO_x monitoring are planned for the next year. However, with the pending decision about lowering the Ozone NAAQS, ozone levels are a looming problem and the AQD will be looking for data to identify NO_x sources. AQD may request additional NO_x monitors at AIRS sites 35-001-1013 and 35-001-0029 in 2008-2009.

CO – The AQD currently operates six (6) CO monitors. Albuquerque/Bernalillo County was declared non-attainment for CO from 1978 – 1996. While levels have come down for a variety of reasons, the city remains in maintenance status. In 2006, the AQD requested permission to operate five of the monitors during winter months only (October

– March), and the change was approved by EPA Region VI. The monitor that historically recorded the highest CO readings (AIRS site 35-0010-0019) will continue to operate year around.

PM2.5 Chemical Speciation

CFR 40 monitoring regulations require speciation at approved NCORE sites. The Del Norte site in Albuquerque (AIRS 35-001-0023) is the proposed NCORE site for the state of New Mexico. Speciation filters are sent to RTI for analysis by the EPA selected contractor and data is reported to the AQS. The AQD uses this data in local studies to find correlation with data from toxics monitors.

Visibility

Albuquerque-Bernalillo County does not have any Class I areas. It exhibits good visibility much of the year but does experience a brown cloud in winter months, particularly during temperature inversions. For that reason, the AQD operates a Nephelometer at one site (35-001-0023) and Aethelometers at two sites (Airs 35-001-0023 and 35-001-0029). The data from these instruments is reported to AQS. In the near future, AQD intends to have a Nephelometer and Aethelometer at three sites (add AIRS 35-001-1013), distributed in a triangular arrangement to cover all parts of the city. This instrumentation will help to identify the smoke contribution to the “brown cloud” from residential wood burning during winter months. Another Nephelometer and Aethelometer are currently being procured and installation/activation is expected during calendar year 2007.

Toxics

The AQD has participated in toxics monitoring studies in the past, but there were none in 2005. A Toxics study will begin in July and will last for one year. It will sample at 3 locations for Carbonyls (TO-11), Semi-volatiles (TO-13), VOC's (TO-15), and heavy metals. Some limited vertical data will also be acquired with instruments mounted on tethered balloons, to support modeling and risk assessment. Sampling will occur on a 1 in 6 schedule to synchronize with all other instruments operating on that cycle, particularly the Speciation monitor. This will allow the maximum use of network data for analysis and comparisons.

Two other toxic activities have been proposed. One would add a fourth site to the effort described in the previous paragraph, focusing on and would focus on toxic levels at an elementary school immediately adjacent to Interstate 40.

The second prospective activity would look at dry-deposition Mercury, using hi-volume samplers and Inductively Coupled Plasma – Mass Spec (ICP-MS) for analysis. While there are no known major mercury sources in Bernalillo County, New Mexico has significant mercury sources (coal-fired EGUs). New Mexico has one monitoring site in the Mercury Deposition Network that reports the highest levels in the US.

There are questions, however, about the validity of wet-deposition measurements in arid Western states. Infrequent and very low level precipitation produces samples that

represent longer accumulation intervals and very little dilution, which may skew the results. At the same time, the vast majority of the State's waters carry warnings for mercury content in fish, so mercury deposition must be occurring by some mechanism. Since there is so little rain, dry deposition is thought to play a significant role in Mercury transport, but until a dry deposition analysis method is available, the scope of the problem will be poorly understood - resulting in misguided and/or ineffective control measures.

If this project is approved, Mercury analysis by ICP-MS will be compared to speciation analysis from the NCORE site, and when possible to wet-deposition analysis. While the project is primarily aimed at method development, results will be reported to EPA in a final report. Depending upon the outcome, the AQD may continue with dry deposition or may participate in the Mercury Deposition Network with a wet-deposition monitor.

Summary

Any comments pertaining to this document should be sent to:

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