REASONABLE FURTHER PROGRESS REPORT FOR THE MONO BASIN PM-10 STATE IMPLEMENTATION PLAN

September 2001

This document provides a progress report on air quality trends in the Mono Basin federal PM-10[1] nonattainment area since the adoption of the Mono Basin PM-10 State Implementation Plan in May 1995.

Introduction

The Mono Basin PM-10 planning area experiences episodes of high PM-10 concentrations due to dust storms generated from the exposed lake bed of Mono Lake. Lake bed sediments and efflorescent salts provide a source of PM-10 sized particles that can become airborne under windy conditions. During the late fall and spring, efflorescent salts form on large portions of Mono Lake=s exposed shoreline creating highly erodible soil conditions. Prior to 1995, PM-10 monitors located downwind from dust source areas at Mono Lake measured peak PM-10 concentrations around 1,000 ì g/m^3, which was more than 6 times higher than the National Ambient Air Quality Standard (federal standard) of 150 ì g/m^3 for a 24-hour average.

The exposure of the lake bed to wind erosion is primarily due to the diversion of Mono Lake=s tributary streams by the City of Los Angeles from 1941 to 1989. During this period, the City=s water diversions caused the lake level to drop approximately 45 feet, exposing more than 9 square miles of highly erodible soils to wind erosion.

The high air pollution levels at Mono Lake prompted the US Environmental Protection Agency to designate the Mono Basin as a federal PM-10 nonattainment area in 1993. The Mono Basin PM-10 nonattainment area was identified as the portion of the Mono Lake hydrologic basin that lies within California. The Mono Basin PM-10 State Implementation Plan (SIP) was adopted by the Great Basin Unified Air Pollution Control District (District) and the State of California in response to this federal nonattainment designation in accordance with the requirements of the 1990 Clean Air Act (Patton and Ono, 1995). In general, a SIP provides an analysis of the air

---

1 *PM-10 stands for particulate matter less than 10 microns. PM-10-sized particles, which are emitted from the wind blown lake bed soils at Mono Lake, are extremely small, less than a tenth the diameter of a human hair. Because of their small size they can penetrate deep into the lungs causing health problems for people with asthma, bronchitis and other heart and lung diseases.*

quality problem and identifies the control measures necessary to reduce air pollution to a level that will attain the federal air quality standards. For the Mono Basin, the SIP relies on the State Water Resources Control Board (SWRCB) decision, known as Decision 1631, to provide an enforceable mechanism to raise the lake level to 6,391 feet above mean sea level, and to consequently submerge exposed sources of wind blown dust around Mono Lake's shoreline.

Clean air was one of several public trust values considered in the historic SWRCB Decision 1631, which was approved on September 28, 1994 after a lengthy evidentiary hearing. Decision 1631 amended the City's water right licences in the Mono Basin to require specific actions for the recovery of resources degraded by 48 years of diverting tributary streams that normally flowed into Mono Lake. The decision established minimum stream flows and flushing flows for tributary streams to protect fisheries. It also required increasing the lake level at Mono Lake to 6,391 feet to protect aquatic and terrestrial ecosystems, enhance scenic resources, and to meet clean air standards by submerging the exposed sources of wind blown PM-10. (SWRCB, 1994)

Air Quality and Lake Level

The air quality modeling analysis in the SIP showed that the 6,391 foot lake level would likely be sufficient to bring the area into attainment with the federal PM-10 standard, since the lake would then submerge much of the exposed lake bed that was causing the dust storms. The time it will take to reach the final lake level depends on the annual runoff in the Mono Basin.

As shown in Figure 1, the SIP estimated that it will take 26 years for Mono Lake to rise to 6,391 feet under normal runoff conditions. Historic records show that if there is an extremely wet series of years it could reach the target level in as little as nine years. Conversely a series of drought years could extend the period to reach attainment to 38 years (Figure 2).

Since the adoption of the SIP in 1995, Mono Lake benefitted from higher than normal runoff between 1995 and 1999 which brought the lake level up about 9 feet to 6,384.8 feet during the 4 year period. However, as shown in Figure 1, lower lake levels in the last two years have set back some of the early progress made toward meeting the lake level target and the federal PM-10 standard.

Although the rising lake level is ahead of the predicted schedule for normal runoff, the lake level decreases in the last two years seem contrary to the lake level change predicted by the hydrologic model. As Figure 1 shows, the hydrologic model predicts a steady lake level rise for normal runoff conditions. In 2000 and 2001, however, the April 1 lake level dropped 0.3 feet and 0.7 feet despite runoff volumes for the preceding years that were 92% and 82% of the normal runoff into Mono Lake, respectively. However, conditions such as increased evaporation or percolation can result in a decrease in lake level with near normal runoff.

The graph shown in Figure 3 provides a comparison of the lake level to annual runoff (runoff period April 1 - March 31) from 4 creeks that are monitored in the Mono Basin by the City of Los Angeles; Rush, Lee Vining, Parker and Walker (LADWP, 2001 and MLC, 2001). The runoff data does not include other creeks in the basin. Although the long-term mean runoff for the 4 creeks is 118,600 ac-ft/yr based on runoff data from 1946-1995, LADWP has exported 16,000 acre-feet per year in accordance with the amended license since 1997. The exported volume is subtracted from the annual runoff to determine the long-term mean creek runoff to Mono Lake shown in Figure 3. The Los Angeles Department of Water & Power is expected to evaluate the hydrologic model to determine if adjustments need to be made to the model or the input data (McBain, 2001).

An air quality modeling analysis was performed for the SIP to estimate PM-10 concentrations at the historic Mono Lake shoreline as the lake level rose to submerge wind blown dust areas. The air quality model showed that the 6,391 foot lake level required by Decision 1631 would bring the Mono Basin into attainment with the federal air quality standards for PM-10. Figure 4 shows the results of the modeled PM-10 impacts for Receptor 45, which is the receptor site with the highest modeled PM-10 concentrations. Predicted concentrations at Receptor 45 are shown for each year based on the lake level trend for normal run-off as shown in Figure 1.

Reasonable Further Progress

The trend line shown in Figure 4 for the PM-10 concentrations using the predicted normal runoff is the ›reasonable further progress= trend expected as a result of implementation of the SIP. In addition to the normal runoff trend line, Figure 4 shows the modeled air quality trend from 1995 to 2001 based on the actual lake level on April 1 for each year at four receptor sites: Simis, Warm Springs, Mono Shore and Receptor 45.

Due to the higher than normal runoff from 1995-1999, air quality improvement was ahead of schedule as indicated by the lower than expected modeled concentrations at the monitor sites. The modeled design day PM-10 concentration[2] for Receptor 45 dropped from 838 ì g/m^3 in 1995 to 376 ì g/m^3 in 1999. The modeled air quality trend reversed in 2000 and 2001 as the lake level declined, causing PM-10 concentrations to increase. The model shows Simis in attainment with the PM-10 standard in 2001; however, all sites around the lake shore are not expected to reach attainment until the 6,391 foot lake level target is achieved. Receptor 45, which is the worst case impact site, will not reach attainment until the lake reaches its target level of 6,391 feet. As of April 1, 2001, the lake level was at 6,383.8 feet and is expected to drop over the next year.

---

[2] The design day, which is the 6th highest PM-10 concentration at each receptor site during the 5 years modeled for the SIP attainment demonstration, is used to analyze the air quality trend. Attainment with the federal PM-10 standard is demonstrated when the 6th highest PM-10 concentration at each receptor site over a 5 year period is below 150 ìg/m^3.

Ambient PM-10 Monitor Concentrations

In January 2000, a new ambient PM-10 monitoring site was installed on the north shore of Mono Lake to characterize the highest expected PM-10 concentrations in the nonattainment area. Other current PM-10 monitor sites include Simis and Lee Vining. Monitoring at the Warm Springs site, which was used for the 1995 SIP, was discontinued in 1993. Receptor 45 is an unmonitored site and is located on the northeast shoreline at the site of the highest modeled impact. These sites are shown in Figure 5 with the location of wind blown dust source areas.

The federal Clean Air Act requires attainment with clean air standards in all areas where the public has access, not just at the ambient monitor sites. PM-10 monitor data can be used to demonstrate attainment with federal air quality standards if the monitor site is representative of the worst case air quality in the area after the control strategy has been implemented. An air quality model was used to determine that Receptor 45 is expected to have the highest PM-10 concentrations when the lake level reaches 6,391 feet.

To ensure that PM-10 monitor data can be used to help verify attainment in the future, the District installed the Mono Shore PM-10 monitor site near Receptor 45. Since it began operation in January 2000, ten federal PM-10 violations (>150 ì g/m^3) have been monitored at the Mono Shore site. Five of these violation days had 24-hour average concentrations greater than 1,000 ì g/m^3 with the highest concentration over 10,000 ì g/m^3. The violation days at Mono Shore are shown in Table 1. The sampling frequency was reduced from daily sampling to every third day in October 2000 due to a recall by the manufacturer to make the monitor parts identical and interchangeable.

Appendix A includes all the PM-10 monitor data collected at Simis, Lee Vining and Mono Shore from 1994 through May 2001. No violations of the PM-10 standard were monitored at Simis or Lee Vining due to wind blown dust. However, for the Simis site, this could be due to the sampling frequency of one in six days (later changed in one in three days in 1998) and the significant reduction in PM-10 resulting from the higher lake level. One violation was measured on August 31, 1996 at Simis with a PM-10 concentration of 158 ì g/m^3, but this was due to a wildfire in Yosemite National Park. The Mono Shore site monitored 9 violations of the federal standard in 2000 and one violation in the first six months of 2001. In the future, the Mono Shore site is expected to operate daily from October through December and March through June. Sampling may be suspended during the winter when snow blocks access to the site and may be operated on a one in three day schedule from July through September which is normally a non-dusty period at Mono Lake.

Table 1. Summary of PM-10 violations at Mono Shore monitor site (Jan. 2000 - Jun. 2001).

Date	PM-10 Concentration	Sampling Frequency
April 8, 2000	690 ì g/m^3	Daily
May 4, 2000	1,063 ì g/m^3	Daily
May 6, 2000	490 ì g/m^3	Daily
May 9, 2000	3,059 ì g/m^3	Daily
May 10, 2000	1,513 ì g/m^3	Daily
June 7, 2000	1,642 ì g/m^3	Daily
June 8, 2000	241 ì g/m^3	Daily
October 9, 2000	387 ì g/m^3	Every 3rd Day
November 29, 2000	10,466 ì g/m^3	Every 3rd Day
June 2, 2001	414 ì g/m^3	Daily
June 27, 2001	150 ì g/m^3 *	Daily

* Not considered a NAAQS violation, since it didn't exceed 150 ìg/m^3.

Conclusion

Dust storms and federal PM-10 standard violations continue to occur in the Mono Basin PM-10 nonattainment area. Since it began operation in January 2000, the new Mono Shore monitor site on the north shore of Mono Lake recorded 10 violations of the federal PM-10 standard. Five of the violations were over 1,000 ì g/m^3, with a peak concentration of 10,466 ì g/m^3. The Simis PM-10 monitor site data indicates that PM-10 concentrations at this site may now meet the federal standard. The air quality model shows that PM-10 concentrations at all sites should be going down as the lake level rises and that the rate of improvement is currently ahead of the reasonable further progress trend predicted for normal runoff. The rate of progress, however, has slowed as the lake level declined over the last two years. The lake level decreases in 2000 and 2001 were more than expected by the hydrologic model for runoff years with 92% and 82% flow into Mono Lake. An evaluation of the hydrologic model performance should be done to determine if it is performing properly or if it should be modified for future predictions of lake level changes.

REFERENCES

Note: Refer to the Mono Basin PM-10 SIP (Patton and Ono, 1995) and to Decision 1631 (SWRCB, 1994) shown below for more detailed information on issues discussed in this progress report.

LADWP, 2001. Creek flow data for the Mono Basin was provided by the Los Angeles Department of Water & Power, Bishop, California, 2001.

MLC, 2001. Mono Lake Committee, *Current Lake Level - Tracking the Progress of a Rising Lake*, http://www.monolake.org/live/level.htm, August 2001.

McBain, 2001. *Pers. correspondence, Steve McBain (Los Angeles Department of Water & Power) and Duane Ono (Great Basin Unified Air Pollution Control District)*, May 30, 2001.

Patton and Ono, 1995. Christopher Patton and Duane Ono, *Mono Basin Planning Area PM-10 State Implementation Plan - Final*, Great Basin Unified Air Pollution Control District, Bishop, California, May 1995.

SWRCB, 1994. State of California Water Resources Control Board, *Mono Lake Basin Water Right Decision 1631*, Sacramento, California, September 28, 1994.

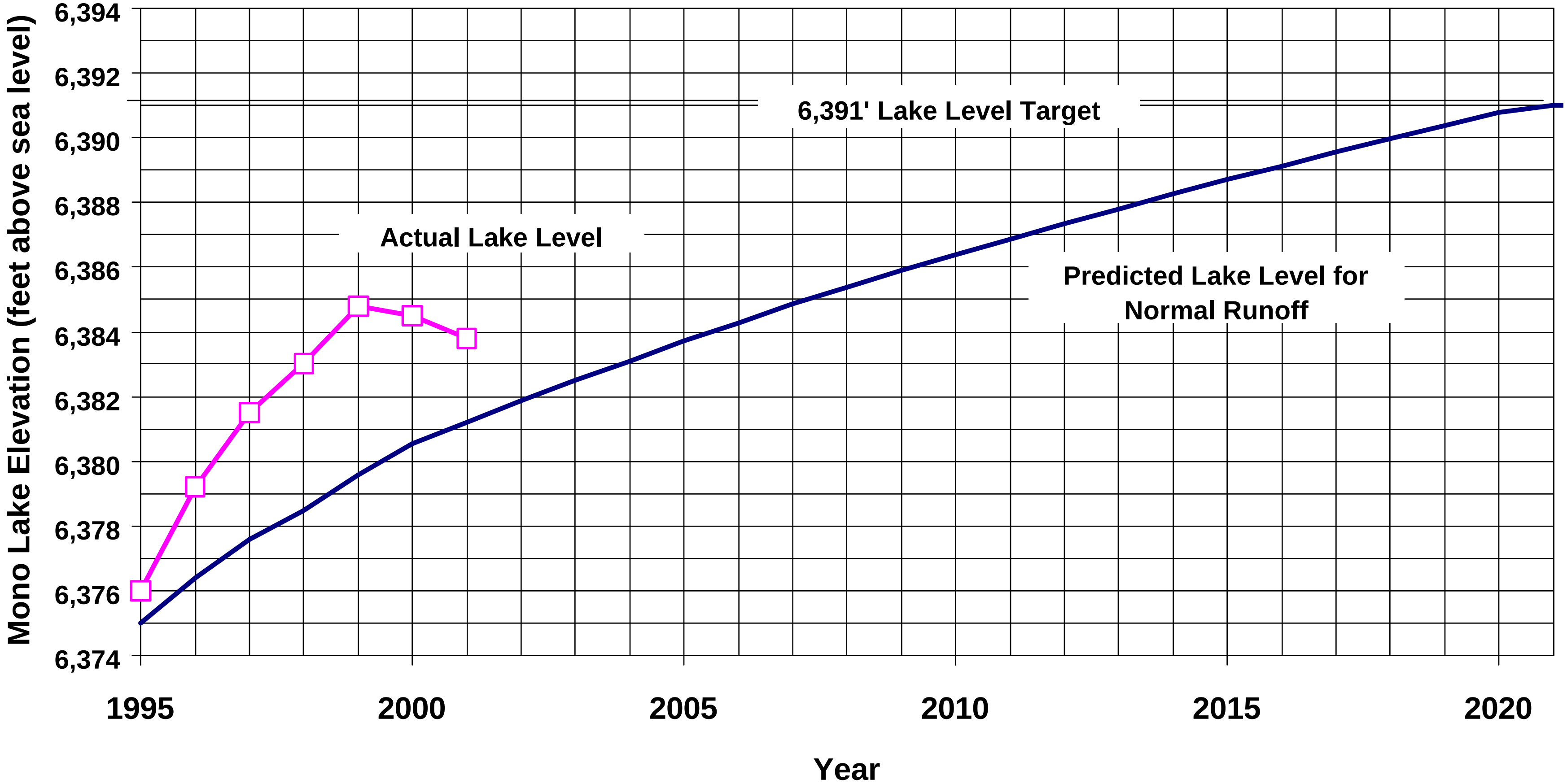

Figure 1. Predicted lake level for normal runoff and actual Mono Lake elevations on April 1.

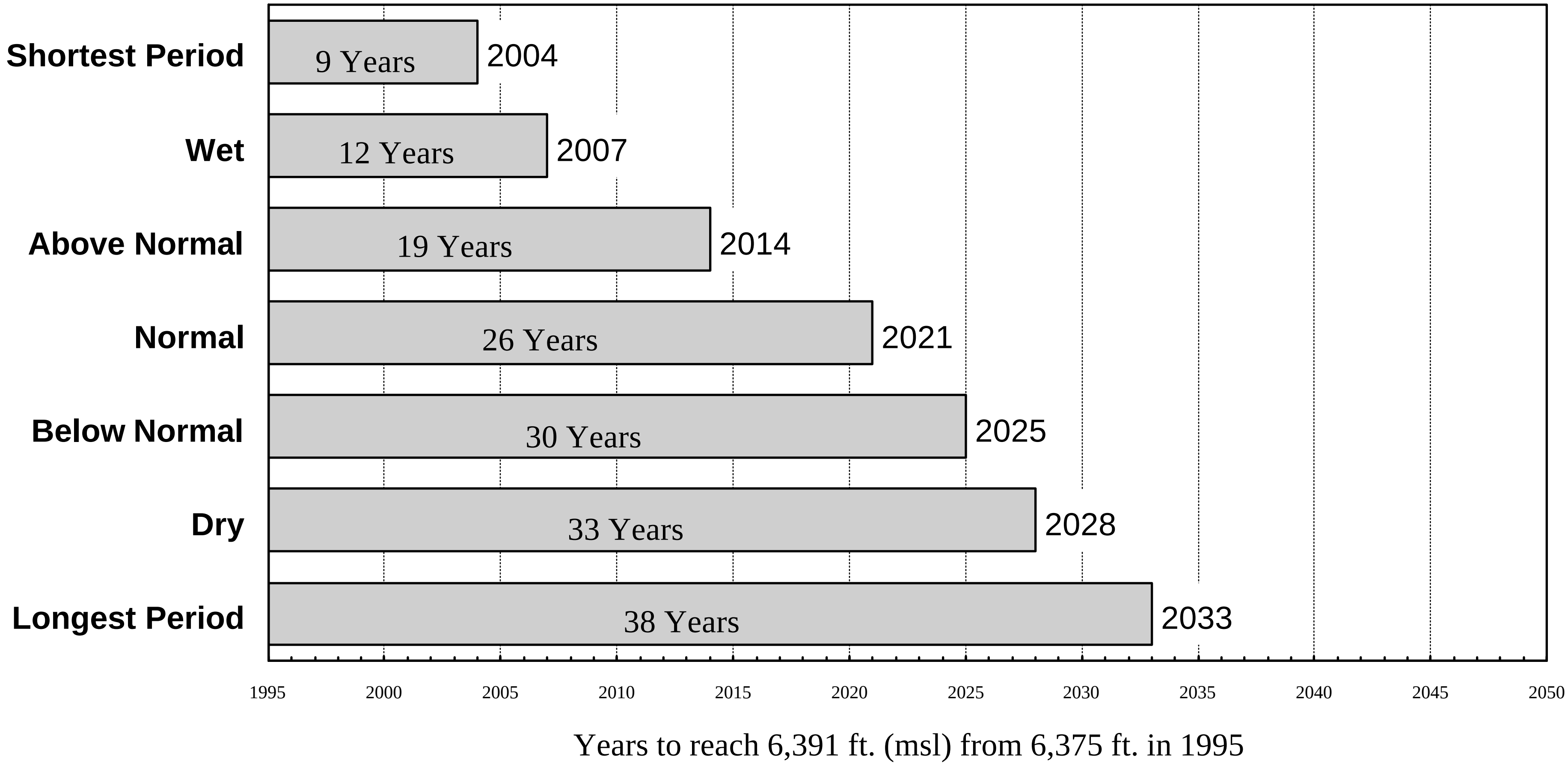

Figure 2. Transition Period Scenarios for Mono Lake Elevation to Reach 6,391 Feet, using D-1631 Operational Rules.

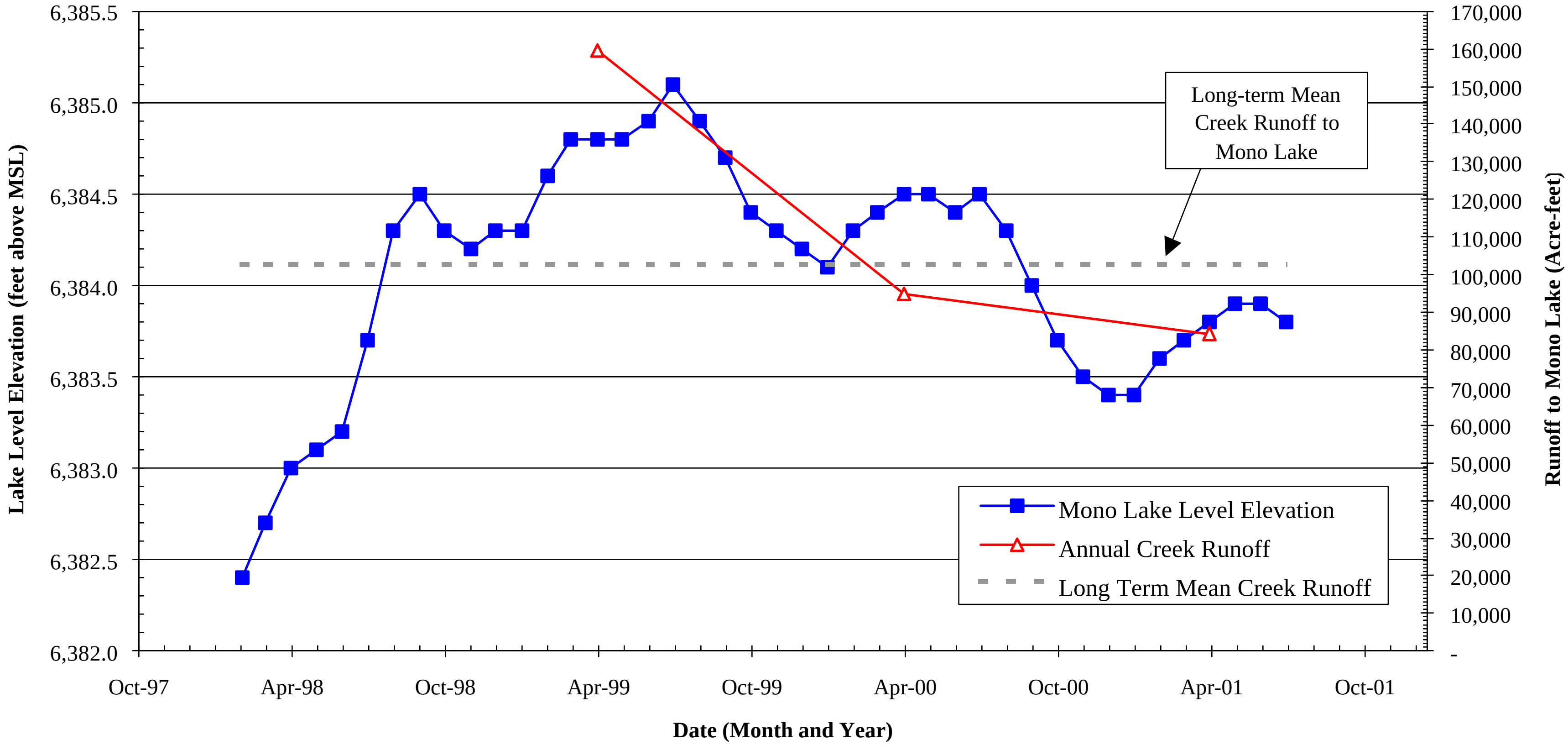

Figure 3. Runoff into Mono Lake and lake level elevations for January 1998 through June 2001 for Rush, Lee Vining, Parker and Walker Creeks (LADWP, 2001 and MLC, 2001).

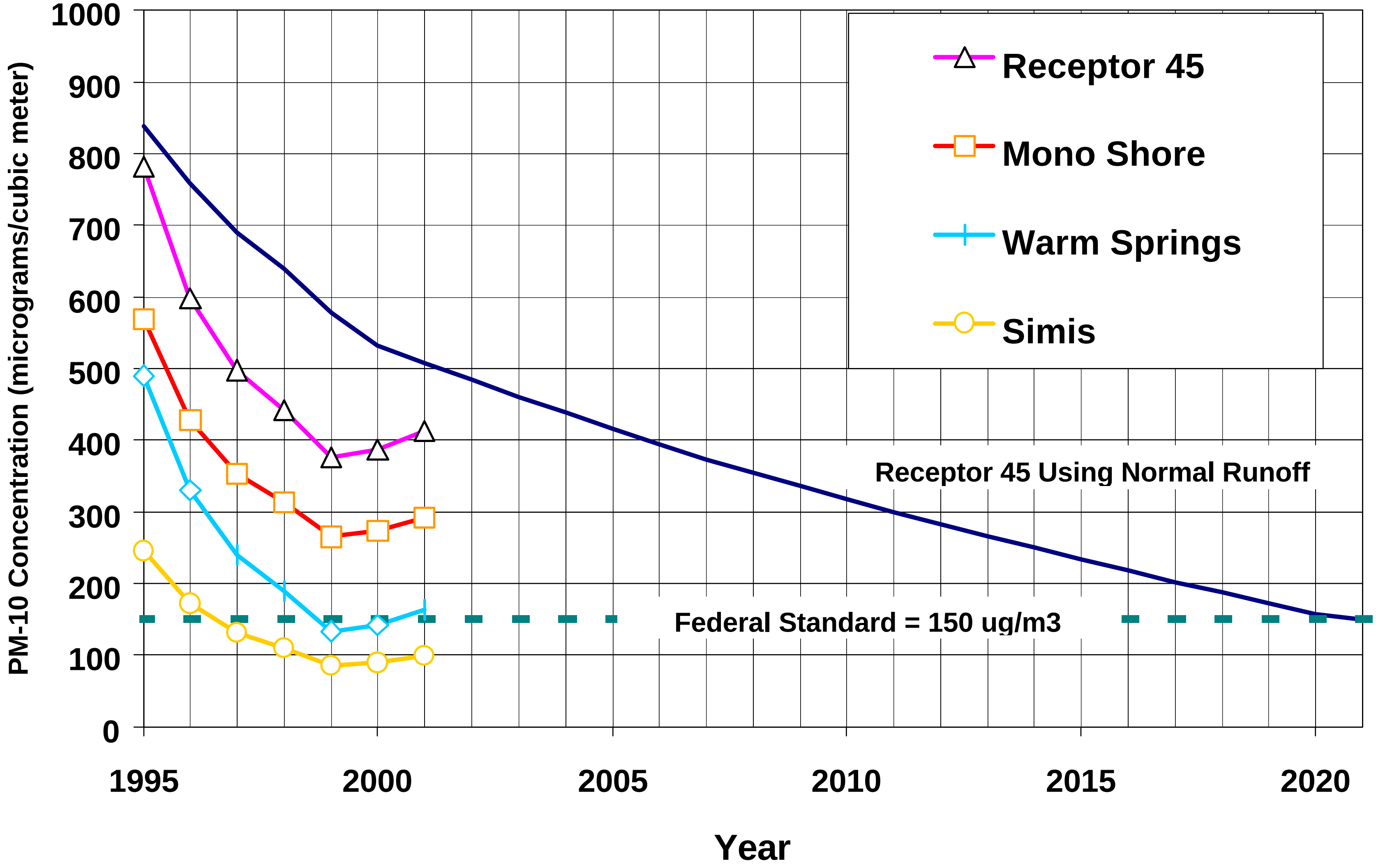

Figure 4. Modeled PM-10 impacts at Mono Lake sites compared to the reasonable further progress trend at Receptor 45 for normal runoff.

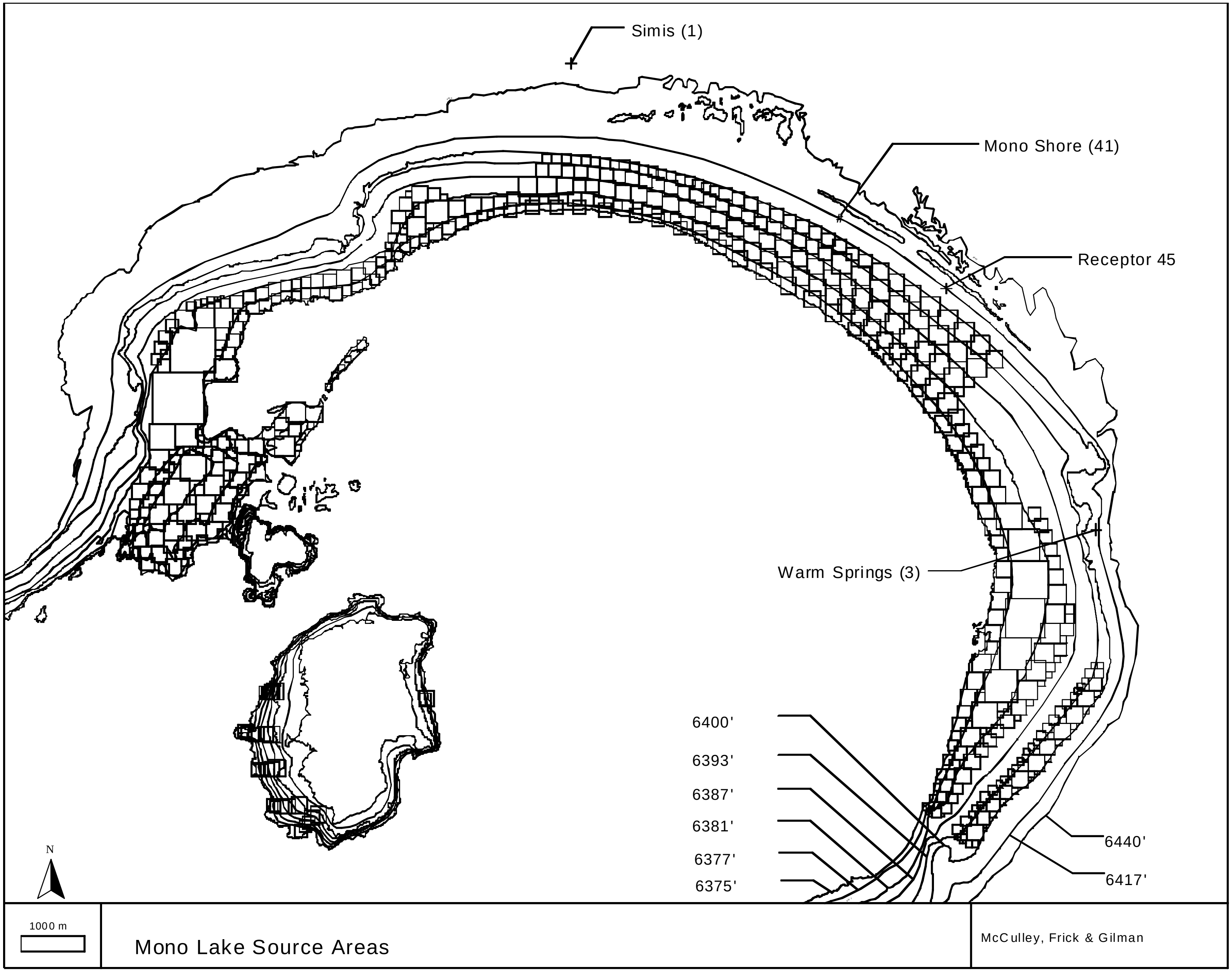

Figure 5. Mono Lake dust source areas and locations of Receptor 45 and monitoring sites at Simis, Mono Shore and Warm Springs.

APPENDIX A

MONO BASIN PM-10 DATA

SIMIS, LEE VINING & MONO SHORE

MONITORING SITES

WITH DATA CAPTURE STATISTICS

January 1994 through June 2001

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 ($\mu g/m^3$)		Simis PM-10 ($\mu g/m^3$)		Mono Shore PM-10 ($\mu g/m^3$)	
01/02/94	15		19			
01/08/94	6		19			
01/14/94	21		13			
01/20/94	20		ND			
01/26/94	9		6			
02/01/94	17		4			
02/07/94	3		2			
02/13/94	15		4			
02/19/94	8		14			
02/25/94	10		10			
03/03/94	12		ND			
03/09/94	6		ND			
03/15/94	8		ND			
03/21/94	8		ND			
03/27/94	11		ND			
04/02/94	6		ND			
04/08/94	3		ND			
04/15/94	13		ND			
04/20/94	19		ND			
05/02/94	12		ND			
05/08/94	6		ND			
05/14/94	21		ND			
05/20/94	7		ND			
06/01/94	5		ND			
06/07/94	6		ND			
06/13/94	2		ND			
06/25/94	7		ND			
07/01/94	6		ND			
07/07/94	11		ND			
07/13/94	16		ND			
07/19/94	15		ND			
07/25/94	9		ND			
07/31/94	10		ND			
08/06/94	12		ND			
08/18/94	19		16			
08/24/94	12		10			
08/30/94	10		10			
09/05/94	ND		10			
09/11/94	10		ND			
09/17/94	11		12			
09/23/94	10		11			
09/29/94	4		ND			
10/05/94	5		3			
10/11/94	8		8			
10/17/94	6		3			
10/23/94	12		8			
10/29/94	11		7			
11/04/94	5		ND			
11/10/94	4		2			
11/16/94	9		ND			
11/22/94	18		4			
11/28/94	26		ND			
12/04/94	4		8			
12/10/94	10		2			
12/16/94	29		3			

Federal PM_{10} Std. = 150 $\mu g/m^3$
State PM_{10} Std. = 50 $\mu g/m^3$

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 ($\mu g/m^3$)		Simis PM-10 ($\mu g/m^3$)		Mono Shore PM-10 ($\mu g/m^3$)	
12/22/94	23		5			
12/28/94	4		6			
01/03/95	13		ND			
01/09/95	2		ND			
01/15/95	7		0			
01/21/95	9		4			
01/27/95	7		4			
02/02/95	ND		8			
02/08/95	9		4			
02/14/95	17		ND			
02/20/95	19		ND			
02/26/95	13		ND			
03/04/95	6		2			
03/10/95	2		4			
03/16/95	10		7			
03/22/95	5		6			
03/28/95	6		4			
04/03/95	9		9			
04/09/95	1		1			
04/15/95	3		4			
04/21/95	1		1			
04/27/95	8		26			
05/03/95	7		4			
05/09/95	8		ND			
05/15/95	4		0			
05/21/95	10		8			
05/27/95	10		ND			
06/02/95	5		4			
06/08/95	5		4			
06/14/95	16		103			
06/20/95	6		7			
06/26/95	11		10			
07/02/95	8		ND			
07/08/95	12		ND			
07/14/95	9		10			
07/20/95	12		ND			
07/26/95	5		8			
08/01/95	16		14			
08/07/95	10		43			
08/13/95	ND		18			
08/19/95	11		8			
08/25/95	13		14			
08/31/95	20		13			
09/06/95	9		12			
09/11/95	11		ND			
09/18/95	13		ND			
09/24/95	10		12			
09/30/95	ND		6			
10/06/95	17		17			
10/12/95	9		ND			
10/18/95	8		ND			
10/24/95	12		ND			
10/30/95	13		ND			
11/11/95	ND		7			
11/17/95	ND		6			

Federal PM_{10} Std. = 150 $\mu g/m^3$
State PM_{10} Std. = 50 $\mu g/m^3$

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 (µg/m³)		Simis PM-10 (µg/m³)		Mono Shore PM-10 (µg/m³)	
11/23/95	ND		7			
11/29/95	ND		3			
12/05/95	ND		5			
12/11/95	ND		7			
12/17/95	18		ND			
12/23/95	13		ND			
12/29/95	11		ND			
01/04/96	10		ND			
01/10/96	13		ND			
01/16/96	5		6			
01/22/96	15		4			
01/28/96	10		5			
02/03/96	12		7			
02/09/96	15		3			
02/15/96	14		5			
02/27/96	12		ND			
03/04/96	3		ND			
03/10/96	8		4			
03/16/96	14		5			
03/22/96	19		15			
03/28/96	5		10			
04/03/96	8		3			
04/09/96	8		7			
04/15/96	18		7			
04/21/96	4		5			
04/27/96	13		13			
05/03/96	8		13			
05/09/96	8		7			
05/15/96	7		36			
05/21/96	9		8			
05/27/96	11		10			
06/02/96	12		12			
06/08/96	13		17			
06/14/96	10		11			
06/20/96	11		13			
06/26/96	5		8			
07/02/96	16		18			
07/08/96	13		13			
07/14/96	9		7			
07/20/96	10		8			
07/26/96	11		10			
08/01/96	13		11			
08/07/96	14		10			
08/13/96	15		10			
08/19/96	40	F	37	F		
08/25/96	32	F	20	F		
08/31/96	83	F	158	F		
09/06/96	14		10			
09/12/96	13		16			
09/18/96	22		28			
09/24/96	16		6			
09/30/96	12		9			
10/06/96	9		10			
10/12/96	14		13			
10/18/96	17		15			

Federal PM_{10} Std. = 150 µg/m^3
State PM_{10} Std. = 50 µg/m^3

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 (µg/m³)		Simis PM-10 (µg/m³)		Mono Shore PM-10 (µg/m³)	
10/24/96	5		9			
10/30/96	4		2			
11/05/96	81		11			
11/11/96	17		0			
11/17/96	5		8			
11/23/96	14		6			
11/29/96	10		5			
12/05/96	ND		8			
12/11/96	11		8			
12/13/96	8	M	ND			
12/17/96	14		5			
12/23/96	12		3			
12/29/96	10		6			
01/04/97	6		3			
01/10/97	8		6			
01/16/97	16		0			
01/22/97	2		1			
01/28/97	11		2			
02/03/97	16		2			
02/09/97	10		ND			
02/13/97	ND		4	M		
02/15/97	14		3			
02/21/97	12		1			
02/27/97	7		3			
03/05/97	9		4			
03/11/97	8		6			
03/17/97	7		6			
03/23/97	7		6			
03/29/97	9		7			
04/04/97	13		13			
04/10/97	4		4			
04/16/97	19		12			
04/22/97	7		7			
04/28/97	11		15			
05/04/97	10		9			
05/10/97	10		8			
05/16/97	12		10			
05/22/97	13		9			
05/28/97	11		7			
06/03/97	11		10			
06/09/97	8		8			
06/15/97	7		4			
06/21/97	7		9			
06/27/97	13		11			
07/03/97	10		11			
07/09/97	ND		15			
07/15/97	17		15			
07/21/97	15		16			
07/27/97	11		ND			
07/29/97	ND		28	M		
08/02/97	11		13			
08/08/97	19		33			
08/14/97	14		11			
08/20/97	17		23			
08/26/97	10		8			

Federal PM_{10} Std. = 150 µg/m^3
State PM_{10} Std. = 50 µg/m^3

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 (μg/m³)		Simis PM-10 (μg/m³)		Mono Shore PM-10 (μg/m³)	
09/01/97	8		7			
09/07/97	7		10			
09/13/97	9		10			
09/19/97	6		5			
09/25/97	9		9			
10/01/97	9		12			
10/07/97	13		12			
10/13/97	8		4			
10/19/97	10		10			
10/25/97	12		8			
10/31/97	10	F	5	F		
11/06/97	12		7			
11/12/97	13		5			
11/18/97	14		6			
11/24/97	10		4			
11/30/97	12		7			
12/06/97	3		2			
12/12/97	17		2			
12/18/97	9		2			
12/24/97	2		ND			
12/30/97	20		3			
01/05/98	23		2			
01/11/98	5		2			
01/17/98	8		2			
01/23/98	18		5			
01/29/98	4		7			
02/06/98	6		3	M		
02/10/98	17		4			
02/16/98	19		5			
02/22/98	5		2			
02/28/98	14		4			
03/06/98	7		4			
03/12/98	48		7			
03/18/98	17		7			
03/24/98	6		7			
03/30/98	10		5			
04/05/98	8		5			
04/11/98	7		5			
04/17/98	10		5			
04/23/98	40		45			
04/29/98	27		25			
05/05/98	3		3			
05/11/98	ND		8			
05/17/98	ND		ND			
05/23/98	ND		9			
05/29/98	ND		10			
06/04/98	ND		10			
06/10/98	ND		7			
06/16/98	ND		14			
06/22/98	ND		11			
06/28/98	ND		7			
07/04/98	ND		11			
07/10/98	ND		11			
07/16/98	ND		11			
07/22/98	ND		8			

Federal PM_{10} Std. = 150 μg/m³
State PM_{10} Std. = 50 μg/m³

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 ($\mu g/m^3$)		Simis PM-10 ($\mu g/m^3$)		Mono Shore PM-10 ($\mu g/m^3$)	
07/28/98	16		9			
08/03/98	13		12			
08/09/98	ND		10			
08/15/98	13		12			
08/21/98	11		7			
08/27/98	15		10			
09/02/98	13		11			
09/08/98	14		8			
09/14/98	13		8			
09/20/98	4		ND			
09/26/98	3		4			
10/02/98	9		4			
10/08/98	9		8			
10/14/98	12		9			
10/20/98	12		9			
10/26/98	9		10			
11/01/98	6		5			
11/07/98	6		24			
11/13/98	17		5			
11/19/98	9		4			
11/25/98	6		3			
12/01/98	7		2			
12/07/98	6		ND			
12/13/98	27		15			
12/19/98	18		14			
12/25/98	7		ND			
12/31/98	20		19			
01/03/99	11		15			
01/06/99	13		5			
01/09/99	ND		4			
01/12/99	9		ND			
01/15/99	3		5			
01/18/99	10		4			
01/21/99	11		2			
01/24/99	2		2			
01/27/99	19		4			
01/30/99	28		4			
02/02/99	13		4			
02/05/99	5		ND			
02/08/99	11		ND			
02/11/99	15		ND			
02/14/99	8		ND			
02/17/99	7		ND			
02/20/99	5		ND			
02/23/99	12		ND			
02/26/99	7		3			
03/01/99	4		4			
03/04/99	7		9			
03/07/99	7		ND			
03/10/99	10		6			
03/13/99	12		9			
03/16/99	11		ND			
03/19/99	6		27			
03/22/99	10		8			
03/25/99	9		5			

Federal PM_{10} Std. = 150 $\mu g/m^3$

State PM_{10} Std. = 50 $\mu g/m^3$

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 (µg/m³)		Simis PM-10 (µg/m³)		Mono Shore PM-10 (µg/m³)	
03/28/99	29		20			
04/03/99	16		27			
04/06/99	13		3			
04/09/99	7		4			
04/12/99	10		8			
04/15/99	11		10			
04/18/99	13		3			
04/21/99	40		32			
04/24/99	15		ND			
04/27/99	10		15			
04/30/99	ND		7			
05/03/99	18		33			
05/06/99	ND		20			
05/09/99	12		13			
05/12/99	17		32			
05/15/99	10		10			
05/18/99	12		12			
05/21/99	13		14			
05/24/99	13		12			
05/27/99	18		11			
05/30/99	14		14			
06/02/99	12		ND			
06/05/99	8		9			
06/08/99	8		6			
06/11/99	13		10			
06/14/99	6		12			
06/17/99	14		13			
06/20/99	ND		10			
06/23/99	18		24			
06/26/99	10		ND			
07/02/99	24		28			
07/05/99	11		ND			
07/08/99	15		14			
07/11/99	11		13			
07/14/99	21		21			
07/17/99	10		11			
07/20/99	20		13			
07/23/99	14		13			
07/26/99	10		9			
07/29/99	9		9			
08/01/99	ND		10			
08/04/99	ND		9			
08/07/99	9		7			
08/10/99	8		6			
08/13/99	8		6			
08/16/99	11		8			
08/19/99	14		13			
08/22/99	13		12			
08/25/99	20		16			
08/28/99	16		16			
08/31/99	14		ND			
09/03/99	24		ND			
09/06/99	14		13			
09/09/99	15		12			
09/12/99	13		16			

Federal PM_{10} Std. = 150 µg/m³
State PM_{10} Std. = 50 µg/m³

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 (µg/m³)		Simis PM-10 (µg/m³)		Mono Shore PM-10 (µg/m³)	
09/15/99	13		13			
09/18/99	10		7			
09/21/99	13		10			
09/24/99	10		11			
09/27/99	11		11			
09/30/99	17		16			
10/03/99	26		24			
10/06/99	ND		14			
10/09/99	9		5			
10/12/99	12		11			
10/15/99	12		12			
10/24/99	ND		11			
10/27/99	6		8			
10/30/99	7		5			
11/02/99	9		5			
11/05/99	ND		6			
11/08/99	6		3			
11/11/99	7		6			
11/14/99	9		7			
11/17/99	30		13			
11/20/99	3		3			
11/23/99	9		ND			
11/26/99	5		3			
11/29/99	16		27			
12/02/99	17		133			
12/05/99	10		4			
12/08/99	ND		9			
12/11/99	13		2			
12/14/99	15		8			
12/17/99	14		6			
12/20/99	11		5			
12/23/99	ND		3			
12/26/99	17		ND			
12/29/99	11		ND			
01/04/00	25		25			
01/07/00	18		8			
01/10/00	24		25			
01/13/00	7		5		10	
01/14/00	ND		ND		7	
01/15/00	ND		ND		5	
01/16/00	6		4		ND	
01/17/00	ND		ND		4	
01/19/00	7		3		5	
01/20/00	ND		ND		5	
01/21/00	ND		ND		3	
01/22/00	8		5		4	
01/23/00	ND		ND		4	
01/24/00	ND		ND		3	
01/25/00	5		2		2	
01/27/00	ND		ND		4	
01/28/00	14		5		3	
01/29/00	ND		ND		5	
01/30/00	ND		ND		4	
01/31/00	8		4		3	
02/01/00	ND		ND		3	

Federal PM_{10} Std. = 150 µg/m³
State PM_{10} Std. = 50 µg/m³

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 (µg/m³)		Simis PM-10 (µg/m³)		Mono Shore PM-10 (µg/m³)	
02/03/00	62		11		101	
02/04/00	ND		ND		13	
02/05/00	ND		ND		14	
02/06/00	8		ND		4	
02/07/00	ND		ND		4	
02/08/00	ND		ND		6	
02/09/00	10		ND		ND	
02/10/00	ND		ND		5	
02/11/00	ND		ND		8	
02/12/00	4		2		5	
02/13/00	ND		ND		7	
02/14/00	ND		ND		9	
02/15/00	8		5		3	
02/16/00	ND		ND		5	
02/18/00	8		4		4	
02/19/00	ND		ND		6	
02/20/00	ND		ND		19	
02/21/00	11		3		5	
02/22/00	ND		ND		81	
02/23/00	ND		ND		7	
02/24/00	11		2		1	
02/25/00	ND		ND		3	
02/26/00	ND		ND		5	
02/27/00	10		4		5	
02/28/00	ND		ND		3	
02/29/00	ND		ND		5	
03/01/00	20		4		2	
03/02/00	ND		ND		4	
03/03/00	ND		ND		3	
03/04/00	12		5		3	
03/05/00	ND		ND		4	
03/06/00	ND		ND		4	
03/07/00	12		3		4	
03/08/00	ND		ND		3	
03/09/00	ND		ND		2	
03/10/00	13		ND		2	
03/11/00	ND		ND		6	
03/12/00	ND		ND		9	
03/13/00	14		4		6	
03/14/00	ND		ND		5	
03/15/00	ND		ND		4	
03/16/00	25		42		57	
03/17/00	ND		ND		4	
03/18/00	ND		ND		7	
03/19/00	31		20		25	
03/20/00	ND		ND		28	
03/21/00	ND		ND		4	
03/22/00	15		8		7	
03/23/00	ND		ND		6	
03/24/00	ND		ND		6	
03/25/00	7		8		7	
03/26/00	ND		ND		10	
03/27/00	ND		ND		10	
03/28/00	7		7		5	
03/29/00	ND		ND		7	

Federal PM_{10} Std. = 150 µg/m^3
State PM_{10} Std. = 50 µg/m^3

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 (µg/m³)		Simis PM-10 (µg/m³)		Mono Shore PM-10 (µg/m³)	
03/30/00	ND		ND		39	
03/31/00	21		28		27	
04/01/00	ND		ND		25	
04/02/00	ND		ND		9	
04/03/00	13		9		8	
04/04/00	ND		ND		14	
04/05/00	ND		ND		7	
04/06/00	10		15		10	
04/07/00	ND		ND		9	
04/08/00	ND		ND		690	
04/09/00	7		8		25	
04/10/00	ND		ND		12	
04/11/00	ND		ND		9	
04/12/00	13		11		15	
04/13/00	ND		ND		21	
04/14/00	ND		ND		7	
04/15/00	5		4		7	
04/16/00	ND		ND		10	
04/17/00	ND		ND		6	
04/18/00	3		10		6	
04/19/00	ND		ND		3	
04/20/00	ND		ND		5	
04/21/00	8		ND		15	
04/22/00	ND		ND		10	
04/23/00	ND		ND		10	
04/24/00	ND		ND		8	
04/25/00	ND		ND		12	
04/26/00	ND		ND		27	
04/27/00	30		40		31	
04/28/00	ND		ND		20	
04/29/00	ND		ND		8	
04/30/00	11		10		9	
05/01/00	ND		ND		12	
05/02/00	ND		ND		12	
05/03/00	14		19		17	
05/04/00	ND		ND		1063	
05/05/00	ND		ND		42	
05/06/00	7		8		490	
05/07/00	ND		ND		7	
05/08/00	ND		ND		15	
05/09/00	18		50		3059	
05/10/00	ND		ND		1513	
05/11/00	ND		ND		14	
05/12/00	8		8		13	
05/13/00	ND		ND		14	
05/14/00	ND		ND		51	
05/15/00	12		15		ND	
05/16/00	ND		ND		23	
05/17/00	ND		ND		18	
05/18/00	12		10		ND	
05/19/00	ND		ND		19	
05/20/00	ND		ND		10	
05/21/00	16		11		10	
05/22/00	ND		ND		11	
05/23/00	ND		ND		11	

Federal PM_{10} Std. = 150 µg/m^3
State PM_{10} Std. = 50 µg/m^3

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 ($\mu g/m^3$)		Simis PM-10 ($\mu g/m^3$)		Mono Shore PM-10 ($\mu g/m^3$)	
05/24/00	12		ND		9	
05/25/00	ND		ND		13	
05/26/00	ND		ND		8	
05/27/00	8		ND		9	
05/28/00	ND		ND		24	
05/29/00	ND		ND		56	
05/30/00	12		ND		9	
05/31/00	ND		ND		9	
06/01/00	ND		ND		13	
06/02/00	12		9		10	
06/03/00	ND		ND		10	
06/04/00	ND		ND		23	
06/05/00	14		13		12	
06/06/00	ND		ND		17	
06/07/00	ND		ND		1642	
06/08/00	6		10		241	
06/09/00	ND		ND		5	
06/10/00	ND		ND		8	
06/11/00	7		8		7	
06/12/00	ND		ND		7	
06/13/00	ND		ND		6	
06/14/00	11		7		6	
06/15/00	ND		ND		20	
06/16/00	ND		ND		13	
06/17/00	15		18		17	
06/18/00	ND		ND		28	
06/19/00	ND		ND		13	
06/20/00	13		10		9	
06/21/00	ND		ND		17	
06/22/00	ND		ND		46	
06/23/00	15		15		18	
06/24/00	ND		ND		21	
06/25/00	ND		ND		17	
06/26/00	11		11		14	
06/27/00	ND		ND		12	
06/28/00	ND		ND		79	
06/29/00	21		13		21	
06/30/00	ND		ND		14	
07/01/00	ND		ND		9	
07/02/00	8		ND		8	
07/03/00	ND		ND		13	
07/04/00	ND		ND		11	
07/05/00	ND		ND		9	
07/06/00	ND		ND		11	
07/07/00	ND		ND		13	
07/08/00	11		ND		13	
07/09/00	ND		ND		12	
07/10/00	ND		ND		13	
07/11/00	17		ND		15	
07/12/00	ND		ND		15	
07/14/00	16		11		12	
07/15/00	ND		ND		13	
07/16/00	ND		ND		15	
07/17/00	10		9		7	
07/18/00	ND		ND		6	

Federal PM_{10} Std. = 150 $\mu g/m^3$
State PM_{10} Std. = 50 $\mu g/m^3$

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 (µg/m³)	Simis PM-10 (µg/m³)	Mono Shore PM-10 (µg/m³)
07/19/00	ND	ND	7
07/20/00	13	8	5
07/21/00	ND	ND	15
07/22/00	ND	ND	7
07/23/00	12	17	7
07/24/00	ND	ND	7
07/25/00	ND	ND	11
07/26/00	ND	ND	8
07/28/00	ND	ND	11
07/29/00	17	26	13
07/30/00	ND	ND	23
07/31/00	ND	ND	53
08/01/00	29	34	34
08/02/00	ND	ND	29
08/03/00	ND	ND	18
08/04/00	14	15	ND
08/06/00	ND	ND	15
08/07/00	14	ND	12
08/08/00	ND	ND	13
08/09/00	ND	ND	14
08/10/00	10	ND	9
08/11/00	ND	ND	7
08/12/00	ND	ND	8
08/13/00	9	ND	6
08/14/00	ND	ND	7
08/15/00	ND	ND	7
08/16/00	11	12	9
08/18/00	ND	ND	7
08/19/00	8	ND	7
08/20/00	ND	ND	7
08/21/00	ND	ND	12
08/22/00	21	20	12
08/23/00	ND	ND	23
08/24/00	ND	ND	14
08/25/00	13	ND	14
08/26/00	ND	ND	9
08/27/00	ND	ND	9
08/28/00	11	13	8
08/29/00	ND	ND	9
08/30/00	ND	ND	9
08/31/00	13	12	ND
09/01/00	ND	ND	8
09/02/00	ND	ND	5
09/03/00	5	ND	5
09/04/00	ND	ND	9
09/05/00	ND	ND	4
09/06/00	ND	ND	3
09/07/00	ND	ND	6
09/08/00	ND	ND	7
09/09/00	9	ND	7
09/10/00	ND	ND	8
09/11/00	ND	ND	9
09/12/00	ND	ND	9
09/13/00	ND	ND	5
09/15/00	11	18	11

Federal PM_{10} Std. = 150 µg/m³

State PM_{10} Std. = 50 µg/m³

F = Fire nearby

M = Make-up for scheduled run

ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 (µg/m³)		Simis PM-10 (µg/m³)		Mono Shore PM-10 (µg/m³)	
09/16/00	ND		ND		13	
09/17/00	ND		ND		8	
09/18/00	10		9		7	
09/19/00	ND		ND		8	
09/20/00	ND		ND		10	
09/21/00	22		14		14	
09/22/00	ND		ND		9	
09/23/00	ND		ND		5	
09/24/00	6		7		5	
09/25/00	ND		ND		6	
09/26/00	ND		ND		4	
09/27/00	10		11		8	
09/29/00	ND		ND		12	
09/30/00	12		11		9	
10/01/00	ND		ND		9	
10/02/00	ND		ND		12	
10/03/00	12		9		9	
10/04/00	ND		ND		7	
10/06/00	11		9		ND	
10/09/00	27		55		387	
10/12/00	7		4		ND	
10/15/00	10		7		7	
10/18/00	14		7		ND	
10/21/00	6		ND		ND	
10/24/00	ND		5		5	
10/27/00	8		3		3	
10/30/00	5		ND		ND	
11/02/00	13		ND		6	
11/05/00	8		ND		30	
11/08/00	38		11		8	
11/11/00	10		4		ND	
11/14/00	ND		2		2	
11/17/00	ND		4		3	
11/18/00	17		ND		ND	
11/20/00	ND		3		5	
11/23/00	13		ND		ND	
11/26/00	11		ND		3	
11/29/00	28		97		10466	
12/02/00	17		7		19	
12/05/00	20		5		7	
12/08/00	11		5		11	
12/11/00	18		5		11	
12/14/00	6		2		9	
12/17/00	11		5		10	
12/20/00	15		5		5	
12/23/00	8		4		12	
12/26/00	18		3		4	
12/29/00	24		ND		2	
01/01/01	21		ND		ND	
01/04/01	29		6		ND	
01/07/01	16		ND		ND	
01/10/01	19		12		ND	
01/13/01	12		3		ND	
01/16/01	18		3		ND	
01/19/01	17		3		ND	

Federal PM_{10} Std. = 150 µg/m³
State PM_{10} Std. = 50 µg/m³

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

DATE	Lee Vining PM-10 (µg/m^3)		Simis PM-10 (µg/m^3)		Mono Shore PM-10 (µg/m^3)	
01/22/01	32		6		ND	
01/25/01	20		3		ND	
01/28/01	36		4		ND	
01/31/01	24		4		ND	
02/03/01	19		6		ND	
02/06/01	49		10		ND	
02/09/01	6		18		ND	
02/12/01	9		3		ND	
02/18/01	12		5		ND	
02/21/01	19		3		ND	
02/24/01	16		4		ND	
02/27/01	14		5		ND	
03/02/01	19		4		ND	
03/05/01	8		4		ND	
03/08/01	46		ND		ND	
03/09/01	ND		5	M	ND	
03/11/01	15		5		ND	
03/14/01	71		8		ND	
03/17/01	12		4		ND	
03/20/01	11		7		ND	
03/23/01	12		5		ND	
03/26/01	8		5		ND	
03/29/01	11		7		ND	
04/01/01	25		8		ND	
04/04/01	ND		ND		ND	
04/07/01	11		2		ND	
04/10/01	8		4		ND	
04/13/01	58		62		ND	
04/14/01	ND		ND		60	
04/15/01	ND		ND		35	
04/16/01	30		22		21	
04/17/01	ND		ND		ND	
04/18/01	ND		ND		18	
04/19/01	ND		ND		6	
04/20/01	ND		ND		6	
04/21/01	ND		ND		6	
04/22/01	18		13		5	
04/23/01	ND		ND		6	
04/24/01	ND		ND		8	
04/25/01	18		14		ND	
04/26/01	ND		ND		ND	
04/27/01	ND		ND		ND	
04/28/01	25		18		14	
04/29/01	ND		ND		9	
04/30/01	ND		ND		15	
05/01/01	14		11		20	
05/02/01	ND		ND		19	
05/03/01	ND		ND		9	
05/04/01	ND		9		ND	
05/05/01	ND		ND		15	
05/06/01	ND		ND		ND	
05/07/01	17		14		16	
05/08/01	ND		ND		21	
05/09/01	ND		ND		26	
05/10/01	15		30		16	

Federal PM_{10} Std. = 150 µg/m^3
State PM_{10} Std. = 50 µg/m^3

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date

Mono Basin PM-10 Monitoring Data

	Lee Vining		Simis		Mono Shore	
	PM-10		PM-10		PM-10	
DATE	(µg/m^3)		(µg/m^3)		(µg/m^3)	
05/11/01	ND		ND		ND	
05/12/01	ND		ND		144	
05/13/01	9		7		6	
05/14/01	ND		ND		7	
05/15/01	ND		ND		5	
05/16/01	18		15		12	
05/17/01	ND		ND		16	
05/18/01	ND		ND		ND	
05/19/01	14		11		12	
05/20/01	ND		ND		15	
05/21/01	ND		ND		10	
05/22/01	22		ND		21	
05/23/01	ND		ND		17	
05/24/01	ND		ND		17	
05/25/01	24		11		ND	
05/26/01	ND		ND		11	
05/27/01	ND		ND		12	
05/28/01	19		10		12	
05/29/01	ND		ND		10	
05/30/01	ND		ND		17	
05/31/01	26		25		15	
06/01/01	ND		ND		69	
06/02/01	ND		ND		414	
06/03/01	6		15		ND	
06/04/01	ND		ND		ND	
06/05/01	ND		ND		8	
06/06/01	9		6		5	
06/07/01	ND		ND		7	
06/08/01	ND		ND		7	
06/09/01	9		7		10	
06/10/01	ND		ND		8	
06/11/01	ND		ND		14	
06/12/01	7		7		50	
06/13/01	ND		ND		13	
06/14/01	ND		ND		10	
06/15/01	19		22		13	
06/16/01	ND		ND		12	
06/17/01	ND		ND		10	
06/18/01	10		6		8	
06/19/01	ND		ND		10	
06/20/01	ND		ND		17	
06/21/01	21		15		17	
06/22/01	ND		ND		21	
06/23/01	ND		ND		26	
06/24/01	12		12		15	
06/25/01	ND		ND		14	
06/26/01	ND		ND		116	
06/27/01	32		21		150	
06/28/01	ND		ND		ND	
06/29/01	ND		ND		9	
06/30/01	12		9		11	

Federal PM_{10} Std. = 150 µg/m^3
State PM_{10} Std. = 50 µg/m^3

F = Fire nearby
M = Make-up for scheduled run
ND = No data for this date