

OFFICE OF THE GOVERNOR

STATE OF MONTANA

JUDY MARTZ
GOVERNOR



STATE CAPITOL
PO Box 200801
HELENA, MONTANA 59620-0801

June 25, 2004

Robert E. Roberts
Regional Administrator
United States Environmental Protection Agency
Region 8 - 999 18th Street - Suite 300
Denver, CO 80202-2466

Re: Libby PM-2.5 Standard Nonattainment Boundary

Dear Mr. Roberts:

On February 25, 2004, Montana designated Lincoln County (part) as nonattainment for particulate matter with an aerodynamic diameter of 2.5 microns and less (PM-2.5) annual average and stated the Universal Transverse Mercator (UTM) grids comprising the Libby PM-2.5 nonattainment boundary would be forthcoming.

Montana hereby defines the Libby PM-2.5 nonattainment boundary to be the area bounded by lines from UTM coordinates beginning at 600000mE, 5370000mN east to 620000mE, 5370000mN south to 620000mE, 5350000mN west to 600000mE, 5350000mN north to 600000mE, 5370000mN. A map depicting the area is provided in Attachment 1.

Montana believes this boundary adequately encompasses the full area violating the standard as well as any nearby source areas that may be contributing to the violation. An analysis supporting the designated boundary is provided in Attachment 2.

Should you have any questions, please contact Trista Glazier, Department of Environmental Quality at (406) 444-3403.

Sincerely,

A handwritten signature in black ink that reads "Judy Martz".

JUDY MARTZ
Governor

RECEIVED

JUL 07 2004

USEPA RA'S OFFICE

c: Jan Sensibaugh, DEQ Director
Steve Welch, Division Administrator, Permitting and Compliance Division
Don Vidrine, Bureau Chief, Air Resources Management Bureau
Trista Glazier, Air Resources Management Bureau

ATTACHMENT 1

MAPS OF LIBBY PM-2.5 NONATTAINMENT AREA BOUNDARY

Libby PM-2.5 Nonattainment Area Boundary

 Nonattainment Boundary

The area bounded by lines from Universal Transverse Mercator (UTM) coordinates:
begin: 600000mE, 5370000mN
east to 620000mE, 5370000mN
south to 520000mE, 5350000mN
west to 800000mE, 5350000mN
north to 600000mE, 5370000mN.



Map Rotation 0°

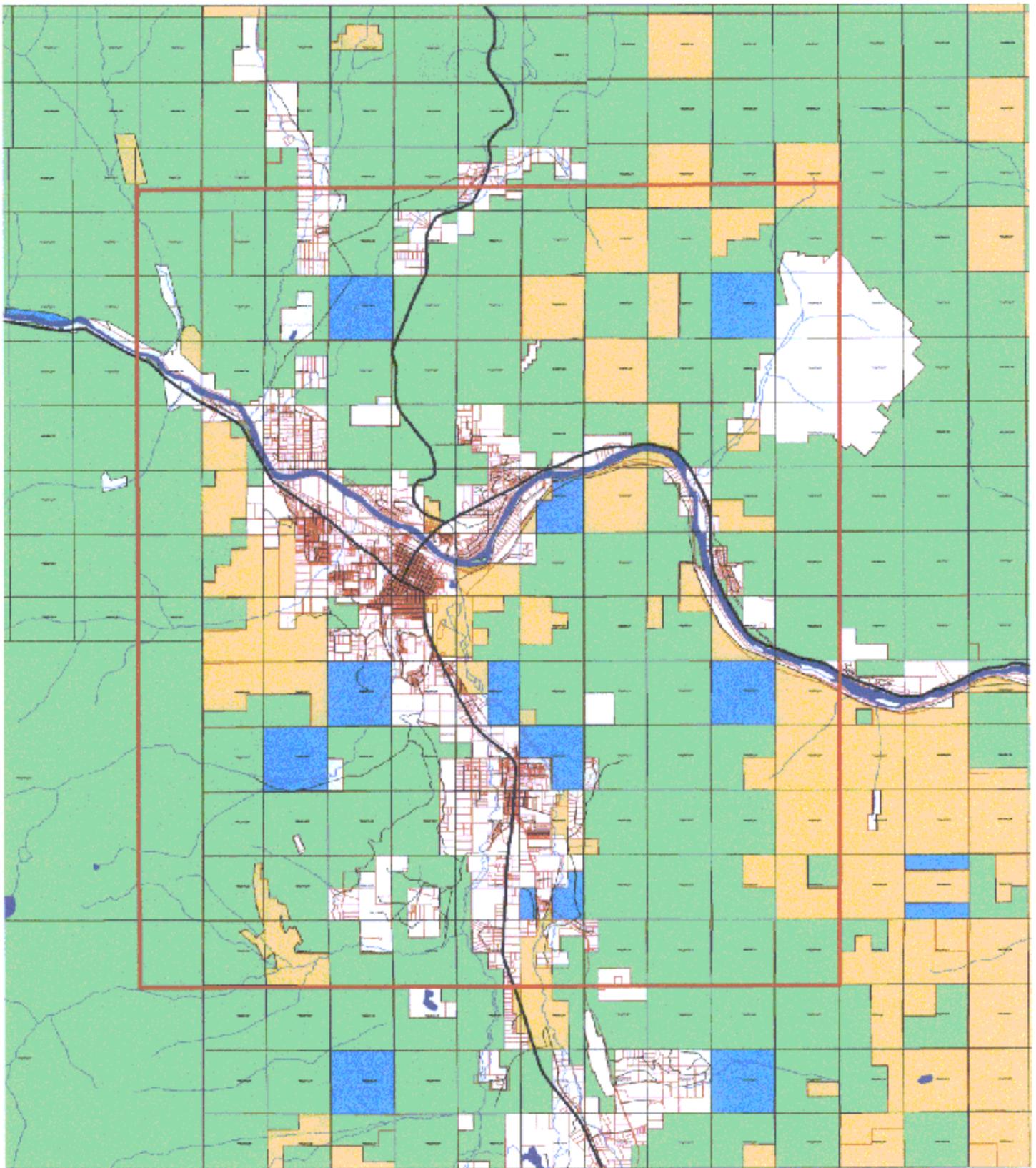


Meters



Map Number 04DEC01192r June 2004

POTENTIAL LIBBY PM-2.5 NONATTAINMENT BOUNDARY

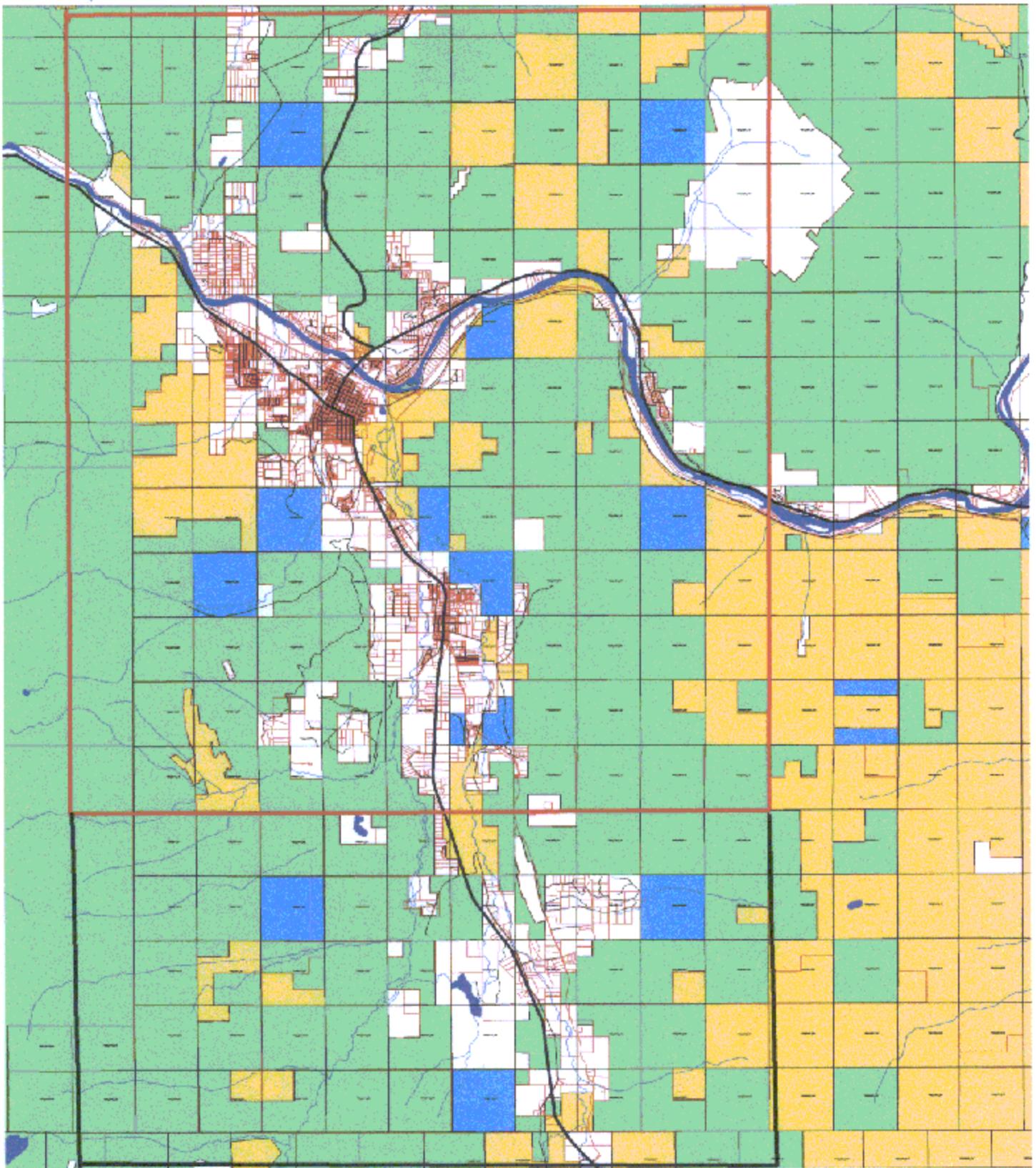


- Private Parcels
- Corporate Land
- Federal Forest Land
- State of Montana

Scale - 1" = 2 mi 

Estimated Population - 9,000 Estimated Private Land - 17,000 acres
Estimated Growth - 1 % per year

POTENTIAL LIBBY PM-2.5 NONATTAINMENT BOUNDARY



Private Parcels
Corporate Land
Federal Forest Land
State of Montana

Estimated Growth - 1 % per year
Estimated Population - 9,000
Estimated Population - 300

Scale - 1" = 2 mi
Estimated Private Land - 17,000 acres
Estimated Private land - 5,000 acres

ATTACHMENT 2

LIBBY PM-2.5 NONATTAINMENT AREA BOUNDARY ANALYSIS

LIBBY PM-2.5 NONATTAINMENT AREA BOUNDARY ANALYSIS

The Libby Courthouse Annex monitoring site (AIRS reference number 30-053-0018) in Lincoln County, Montana in the city of Libby indicates the area is out of compliance with the annual average National Ambient Air Quality Standard (NAAQS) for particulate matter with an aerodynamic diameter of 2.5 microns and less (PM-2.5). Montana designated part of Lincoln County as nonattainment for PM-2.5.

Montana defines the Libby PM-2.5 nonattainment boundary to be the area bounded by lines from UTM coordinates beginning at 600000mE, 5370000mN east to 620000mE, 5370000mN south to 620000mE, 5350000mN west to 600000mE, 5350000mN north to 600000mE, 5370000mN.

This boundary adequately encompasses the area violating the standard as well as any area that may be contributing to the violation. The boundary surrounds a significant portion of the population as well as source areas. In addition, the boundary adequately addresses the unique meteorology and topography of the area.

POPULATION

Lincoln County is located in the northwestern corner of Montana. It is a large rural county encompassing 3,613 square miles. The vast majority of land mass is forest land owned by either the U.S. Forest Service or private timber companies. According to the census, the 2002 population estimate was 18,665.

Within the county, the city of Libby has the largest population. According to the census, the 2002 population estimate within the city limits of Libby was 2,582. However, a large portion of the population resides outside the city limits. According to Lincoln County Planners, it is estimated that approximately 9,000 people reside within the four-grid boundary (see map in Attachment 1).

According to Lincoln County planners, the Libby area has an estimated growth rate of one percent per year. The growth that is occurring is taking place mostly within the proposed nonattainment area.

Traffic and commuting patterns are very localized, mostly concentrated within the Libby valley itself. This is not expected to change.

SOURCE AREAS

Speciation monitoring indicated a large portion of PM-2.5 is comprised of organic carbon. Sources of organic carbon include biogenics, condensable VOCs, and burning of fossil fuels and wood products.

A Chemical Mass Balance (CMB) study is currently underway to identify sources of organic carbon. Results of the study are expected in November. Due to the timeframe indicated by EPA, it is not possible to wait for these results before determining an appropriate boundary.

The one industrial source of concern located in Libby ceased operation in 2002 with no appreciable effect on monitored values. Monitoring also indicated that PM-2.5 concentrations rise considerably in the winter months. Thus, it is assumed the problem most likely stems from residential burning of wood and/or fuel oil.

In order to determine the geographical extent of the PM-2.5 concentrations, a winter monitoring study was conducted from November 2003 to March 2004. A summary of this study is included in this attachment.

Results indicate the concentration of PM-2.5 drops significantly at the northwestern edge of the valley as well as to the northeast, both of which are well within the boundary. A cluster of homes in the southern edge of the valley appeared to have significant PM-2.5 concentrations. This residential area is within the boundary.

While monitoring was not conducted further south, Montana is confident the boundary adequately surrounds the source area. Furthermore, population and private landownership drops significantly south of the boundary. Lincoln County planners estimate by adding an additional two grids to the south, it would only encompass approximately 300 more people and less than 5,000 acres of private land (see map in Attachment 1).

TOPOGRAPHY AND METEOROLOGY

The town of Libby lies along the Kootenai River in the northwestern corner of Montana. The Kootenai Valley is a narrow drainage running east and west in the vicinity of Libby with lesser valleys extending north and south along Pipe and Libby Creeks. Libby lies at an elevation of 2,100 feet with the surrounding mountains rising to over 7,000 feet.

Climatic conditions and Libby's location in a deep mountain valley cause the community to be subjected to some of the poorest atmospheric dispersion in Montana. During the fall and winter, winds are light or nonexistent and temperature inversions are common. Temperature inversions can last for days or weeks and trap particulate matter in the valley. The lack of atmospheric dispersion and presence of frequent temperature inversions serve to isolate the valley further supporting the adequacy of the four-grid boundary.

LIBBY WINTER STUDY

LIBBY WINTER STUDY 2003-04

INTRODUCTION

By the spring of 2003 it had become clear that our monitoring site (30-053-0018) in Libby, Montana was out of compliance with the PM-2.5 National Ambient Air Quality Standard. Winter values were high enough to elevate the annual average above $15 \mu\text{g}/\text{m}^3$. PM-2.5 speciation data showed that a very large organic carbon component existed during the winter months. With an approaching deadline to designate Libby noncompliance, it became important to determine the geographical extent of the problem. The Air Monitoring and Data Management Section developed this study to learn how large an area was represented by our monitoring site at the Courthouse Annex, and hopefully the total geographical extent of the problem. Since any regulatory action to lower the fine particulate exposure would require reduction of the wintertime organic carbon emissions, the Air Quality Policy and Planning Section simultaneously initiated studies to determine the identity and sources of the PM-2.5 organic carbon component.

METHODS

- Past monitoring data indicates that the period of greatly elevated PM-2.5 values is from November through February. This made it possible to operate three pairs of sites on a one-in-three schedule for a month each during the period of interest. We assumed that the pollutants came from the community and that it would be confined to the "T" shaped basin where Libby Creek flows into the Kootenai River. Three sites were located at the limits of the community's population. An additional three sites were located farther out where we speculated changing terrain would have limited spread of the fine particulate. The sites selected are identified on the map in the following pages. Routine sampling continued at the Courthouse Annex site using FRM samplers (method 116) and a MetOne SASS speciation sampler (method 810). Sampling at the special study sites was done with FRM (method 116) samplers also. Meteorological data was available at the Courthouse Annex site. Wind speed data from the Courthouse Annex makes it clear that there is very little wind in Libby in the winter, and it is not a factor on the fine particle measurements.

RESULTS

The following information is included at the end of this document:

- A map of the Libby area identifies the sampling sites.
- A table presents the PM-2.5 concentrations measured at the seven locations over the 11/20/2003-03/07/2004 time period.

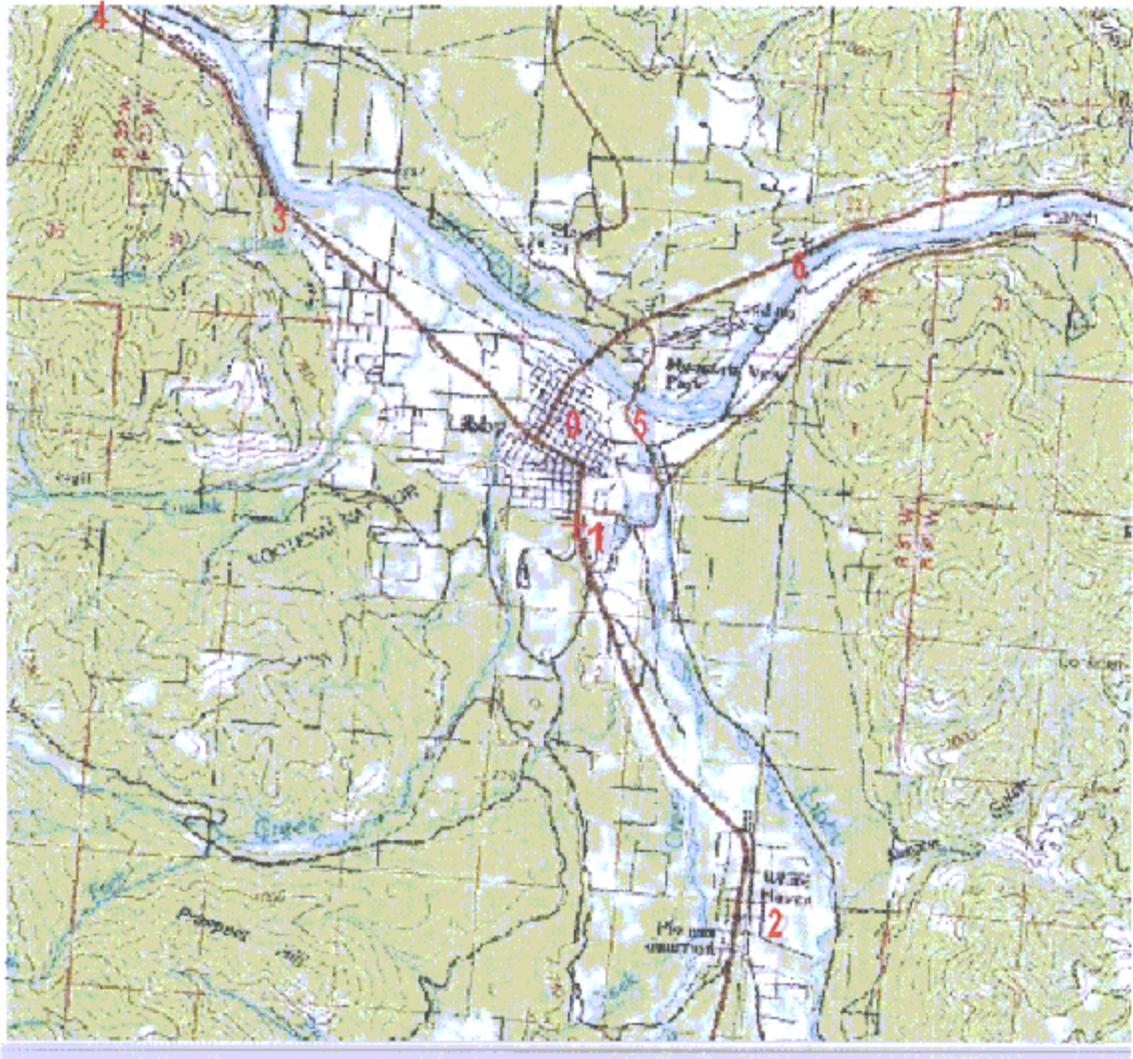
- A two-year period of PM-2.5 data collected with both the FRMs and the Speciation sampler is included to provide an appreciation of the levels being measured at the Courthouse Annex Site, and how it changes with the seasons.
- Speciation data is included to show the composition of the fine particulate over time.

DISCUSSION

A comparison of the PM-2.5 concentrations at the Courthouse Annex (Site 0) with the concentrations measured at the sites on the edge of the community (Sites 1,3, and 5) reveals that the Courthouse Annex concentrations exceeded the other sites in every case. This site is clearly very near the center of the polluted area and very near the maximum concentration. On the other hand, the Courthouse Annex site does not exceed the concentrations measured at the other sites by enough to suggest that it is being impacted by a very local source. Sites 1 and 3 are about 3.5 miles apart and both showed average concentrations of about $20\mu\text{g}/\text{M}^3$ for the months they were being sampled while the Courthouse Site was averaging about $30\mu\text{g}/\text{M}^3$. The relationship between the Courthouse and Site 5 was very similar, but it was later in the season and concentrations were a little lower at both sites. I think it is safe to conclude that the problem encompasses the bulk of the community and that the Courthouse Annex Site is very near the maximum concentration point.

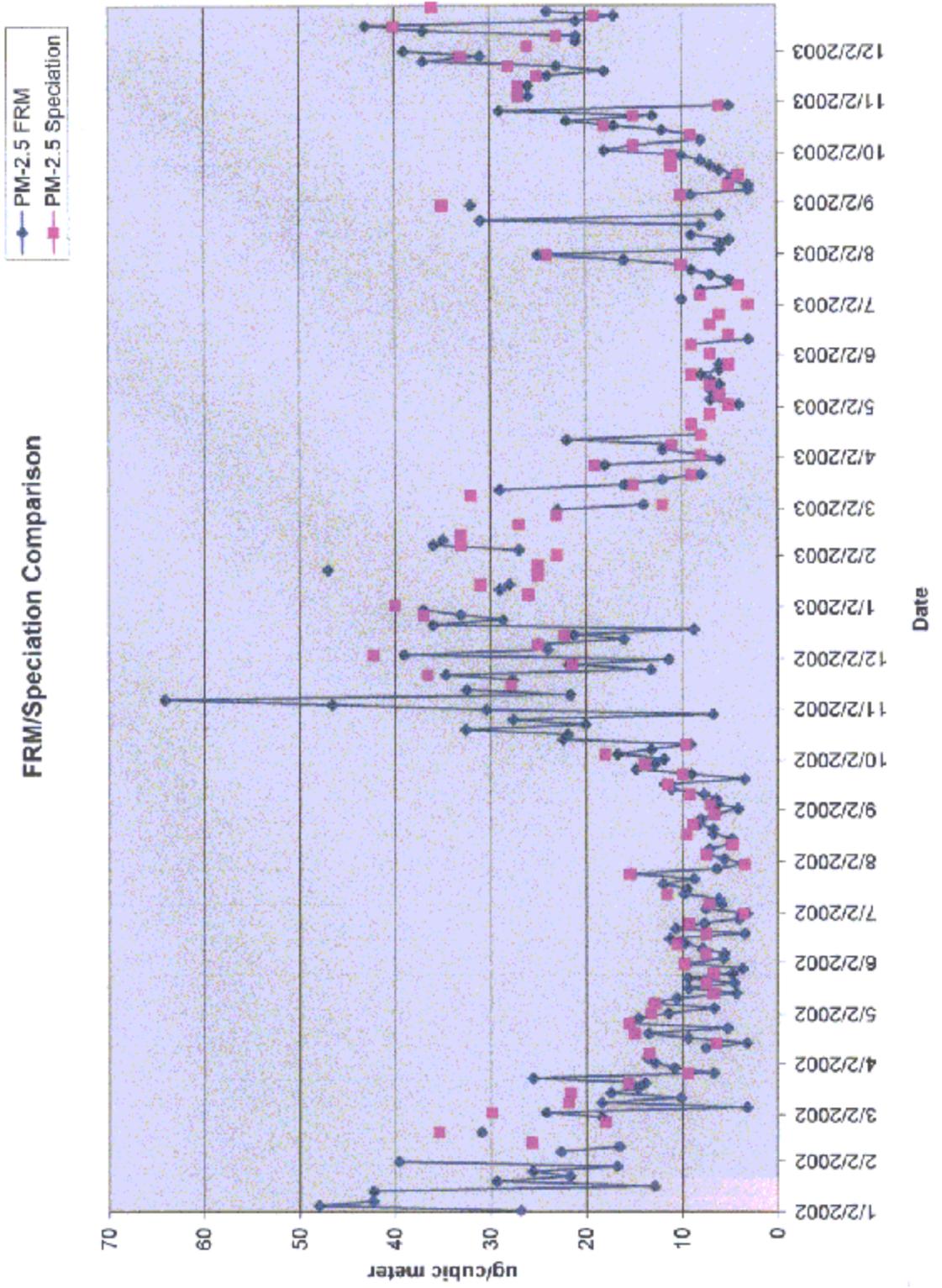
In going two miles from sampling Site 3 to Site 4, the measured concentration dropped to half. The drop between sites 5 and 6 was about 25%. While less precipitous than the drop measured between sites 3 and 4 it did bring the concentration measured at Site 6 down to half the concentration at the Courthouse Annex. Site 2 was a surprise. The concentrations measured at this point 3 miles south of the city's center were just as high, even though Site 1 two and a half miles closer to the city center was down by 30%. The cluster of homes around Site 2 would appear to be a second source producing air quality degradation on a par with the larger community. While Sites 4 and 6 would appear to pretty well define the western and eastern extent of the air quality problem, Site 2 clearly was not far enough out to define the southern extent.

SAMPLE LOCATIONS



LIBBY WINTER STUDY MONITORING RESULTS

Date	SITE					
	0	1	2	3	4	6
	Courthouse Annex	Heritage Museum		Beck's Café	Cedar Creek	
11/20/03	18.0	14.6	25.9			
11/23/03	23.2	20.1	21.4			
11/26/03	36.8	30.7	42.5			
11/29/03	30.7	18.4	26.6			
12/02/03	38.6	27.3	42.0			
12/05/03						
12/08/03	20.8	14.7	16.7			
12/11/03	21.4	16.6	26.9			
12/14/03	37.3	26.6	40.6			
12/17/03	42.5	24.7	47.0			
12/20/03	21.4	16.7	20.7			
Ave	29.1	21.0	31.0			
12/26/03	23.9			17.5	5.2	
12/29/03	not weighed			26.5	12.8	
01/01/04	21.9			27.1	19.0	
01/04/04	23.8			13.0	4.5	
01/07/04	23.0			16.4	12.7	
01/10/04	34.5			20.3	10.6	
01/13/04	27.6			14.1	7.1	
01/16/04	39.1			24.1	7.0	
01/19/04	32.7			25.0	13.3	
01/22/04	29.8			28.9	12.1	
01/25/04				10.6	8.4	
Ave	28.5			20.3	10.3	
01/31/04	8.6					10.0 5.6
02/03/04	27.1					15.9 13.8
02/06/04	29.3					19.2 13.9
02/09/04	24.2					14.7 13.8
02/12/04	25.9					16.8 13.7
02/15/04	37.0					28.9 22.7
02/18/04	33.6					26.2 17.7
02/21/04	29.7					20.7 12.7
02/24/04	33.8					23.1 16.7
02/27/04	24.5					17.6 13.3
03/01/04	25.8					14.4 14.7
03/04/04	23.5					18.0 19.1
03/07/04	17.3					15.1 6.8
Ave	26.2					18.5 14.2



Current Date : 04/06/04
 Current Time : 10:48

Monthly Parameter Report - Hourly Averages
 Environmental Systems Corporation
 01/04

Lower Id : LB
 Site Name : LIBBY COURTHOUSE ANNEX
 Parameter : WSTD
 Units : M/S
 Avg Interval : 01

Transaction : 1 State : 30 County : 053 Site : 0018
 Parameter : 61101 POC : 1 Interval : 1 Units : 011
 Frequency : Method : 050

+++++ AIRS Codes +++++

Day	Hours																															Max	Avg Rds
	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24								
01	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2					
02	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2					
03	2	2	2	2	2	2	2	2	2	2	2	2	2	4	3	3	3	3	3	2	2	2	2	1	1	1	1	4					
04	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
05	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
06	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
07	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
08	2	2	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2					
09	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
10	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
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12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
13	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
14	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
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22	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
23	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
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26	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
27	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1					
28	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2					
29	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
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Max	2	2	2	2	2	2	2	2	2	2	2	2	2	4	4	3	3	3	3	2	2	2	2	2	2	2	4						
Avg	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1						
Rds	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31	31					

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02/24/04	33.8					23.1	16.7
02/27/04	24.5					17.6	13.3
03/01/04	25.8					14.4	14.7
03/04/04	23.5					18.0	19.1
03/07/04	17.3					15.1	6.8
Ave	26.2					18.5	14.2

Courthouse Annex-Libby
AIRS Code 300530018 POC 5 (ROUTINE)

