

ASARCO

February 14, 1990

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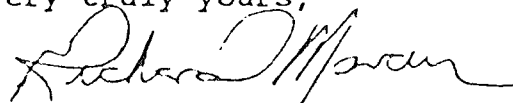
Dear Messrs. Skie and Chaffee:

Pursuant to your request at our meeting on February 6, I have prepared and attached herewith a Proposed Lead SIP Development Program for East Helena. As you know, the primary goals of this program are to develop a successful SIP based on strong technical data, and to deliver such SIP to the EPA by February 1, 1992.

Furthermore, you should be aware that this program will require a substantial commitment of resources by all concerned parties. In fact, Asarco alone will be required to spend hundreds of thousands of dollars in the development of this SIP. Asarco is convinced that any savings realized in the development of the program would be insignificant if the results proved to be erroneous and ill-conceived. The proposed program, however, should provide accurate data and assure the implementation of effective control strategies.

Should you require any further information or clarification, please do not hesitate to call.

Very truly yours,



Richard C. Marcus
Senior Environmental Scientist

RCM/bjs
Attach.

cc: Bob Raisch, F.H. Morison, J.B. Davis, J.C. Nickel (w. attach)

PROPOSED LEAD SIP DEVELOPMENT PROGRAM FOR EAST HELENA

February 14, 1990

On July 9, 1984, the Environmental Protection Agency (EPA) gave final approval to the Montana State Lead Implementation Plan (SIP) for East Helena. The East Helena SIP was developed by an ad hoc committee comprised of representatives from the City of East Helena, the Montana Department of Highways, ASARCO Incorporated (Asarco), American Chemet Corporation (American Chemet) and the Montana Department of Health and Environmental Sciences (MDHES). The final plan required the implementation of several control strategies to reduce ambient air lead concentrations in the vicinity of East Helena. These control strategies were designed to attain and maintain the NAAQS for lead as demonstrated by chemical mass balance receptor modeling.

The results of ambient air monitoring conducted since the implementation of all required control strategies indicate that lead concentrations continue to exceed the standard, even though substantial reductions have occurred. Consequently, the EPA has notified the State of Montana that the lead SIP for East Helena is inadequate and that a new SIP must be developed. The EPA has also notified the State that the new SIP must be based primarily on air quality dispersion modeling as currently required by Federal regulations.

On behalf of the ad hoc committee which has been reactivated, Asarco presents herein a proposed program for the development of a new lead SIP for East Helena. The primary goals of this program are to develop a SIP based on accurate and scientifically defensible data, and to submit such SIP to the EPA on or before February 1, 1992. The SIP will utilize dispersion modeling, supported by both ambient air monitoring and CMB receptor modeling, to select the necessary control strategies and demonstrate attainment of the standard.

PROPOSED LEAD SIP DEVELOPMENT PROGRAM

The development of a dispersion model which accurately predicts lead concentrations in the East Helena area is expected to be extremely difficult for several reasons. First, most of the sources impacting the East Helena area are fugitive in nature and as a result, will be difficult to quantify. Second, dispersion models have difficulty predicting the impact of low-level and fugitive sources when the emissions from such sources encounter wind flow obstructions. Such obstructions are widespread throughout the Asarco/American Chemet complex.

Finally, the elevated terrain to the south of East Helena creates frequent downslope wind flows toward the north. An extensive tracer study has previously demonstrated that a large scale downwash phenomena occurs as these flows pass over the Asarco/American Chemet complex toward the town of East Helena. The substantial impact of this phenomena, however, will be difficult to predict using conventional dispersion modeling techniques.

As a result of these factors, the development of a reliable dispersion model for the East Helena area will require more extensive data collection and reconciliation efforts than would normally be necessary. The SIP development program described hereinbelow incorporates these requirements, and voluntarily includes CMB receptor modeling. Receptor modeling is unaffected by the above described difficulties and will serve to further increase dispersion model validity.

I. Data Acquisition

Model performance is heavily dependent on the quality and quantity of the supporting data. Consequently, the dispersion and receptor modeling efforts for East Helena will be supported by an extensive array of concurrent meteorological, ambient air monitoring and emission inventory data. Although such data will be collected over a one-year period, two important factors are present which will restrict these efforts.

First, Asarco is currently constructing a new facility which will completely enclose and ventilate lead concentrate handling and storage activities. Previous receptor modeling has shown that such activities are currently responsible for up to 40% of the ambient lead concentrations. The new facility, however, will drastically alter and substantially reduce the emissions from this important source. Although completion of the facility is scheduled for March 31, 1990, the emission characteristics of this source will not be representative of future operations until July 1, 1990 when nearly all of the outdoor concentrate handling activities will be eliminated. As a result, any model developed using data collected from this source prior to July 1, 1990 would be useless for the purpose of demonstrating future attainment. In addition, the model would be inaccurate due to the substantial errors associated with quantifying the numerous outdoor handling activities.

The second factor influencing data acquisition involves the final SIP submittal goal of February 1, 1992. The timetable associated with this goal requires that dispersion model reconciliation be completed no later than July 1, 1991. Since this task is expected to be complex and time-consuming in view of the difficulties previously described, time constraints will likely preclude or limit the use of data collected after December 31, 1990 in that effort.

To compensate for these limitations, an intensive data collection program will be carried out on a daily basis during the period July 1 through December 31, 1990. The resultant data base should provide sufficient information with which to develop and reconcile a dispersion model. Thereafter, data will be collected on a normal every-sixth-day cycle during the period January 1 through June 30, 1991. This information will be utilized to define the performance of the reconciled dispersion model on a year-round basis.

A. Meteorological Monitoring

A complex program for monitoring on-site meteorology has already been approved by the MDHES and EPA. This program was necessitated by the non-representative nature of Helena airport data and the need to fully document the downwash phenomena previously identified. The data collected under this program will be used for dispersion model input and to characterize the meteorology influencing the ambient air monitoring sites. Data collection under this program commenced on November 30, 1989 and will continue through at least June 30, 1991.

B. Ambient Air Monitoring

An ambient air monitoring network for SIP development purposes has already been established in the East Helena area. The network was approved by the MDHES and EPA and includes the Firehall, Dartman, Old Railroad and Microwave sites. These sites were selected for SIP development purposes based on predominate meteorology, terrain, emission release heights and historical monitoring results.

The measured concentrations established at these sites will be used to judge dispersion model performance. In addition, a portion of selected filters (i.e., quartz) collected at the Firehall and Old Railroad

sites will be analyzed to provide input data for receptor modeling. These sites were selected for receptor modeling since they represent areas of potential maximum concentrations. During the period July 1 through December 31, 1990, all four monitoring sites will be operated on a daily basis, after which the frequency will be reduced to the current every-sixth-day cycle.

C. Emission Inventories

Several different emission inventories will be required to support the proposed modeling program, including: (1) daily inventories of actual lead emissions for dispersion model validation; (2) a source library of chemical fingerprints for receptor modeling; and, (3) an inventory of maximum allowable daily lead emissions for demonstrating the adequacy of the control strategies using the reconciled dispersion model.

These inventories and other required modeling parameters will be developed for the Asarco and American Chemet facilities as well as non-industrial sources present in the East Helena area. A comprehensive program employing source testing, material balances and emission factor calculations will be used to determine lead emission rates. Moreover, these rates will be related to applicable production variables thereby allowing the development of both maximum allowable and actual daily emission inventories. Emission inventories will initially be developed for 180 individual days during the period July 1 through December 31, 1990. This task will be completed by March 1, 1991. Prior to September 1, 1991, inventories will also be developed for 10 days (i.e., 5 days per quarter) during the period January 1 through June 30, 1991).

II. Dispersion Modeling

Dispersion modeling of the East Helena area will be conducted for both flat and elevated terrains. At elevated terrains, however, violations of the standard are not expected in view of the historical low-lead concentrations measured at the Microwave site. Nevertheless, dispersion modeling will be utilized to verify compliance at all elevated terrain receptors. Initially, the Complex I model operated in the VALLEY screening mode will be employed. Whereas this model is

based on worst-case assumptions, successful screening results should provide the necessary verification of future compliance. In the event of an unsuccessful screen, however, comprehensive modeling using the RTDM model will be conducted. Such modeling will be completed in a manner similar to that described below for flat terrain.

With respect to flat terrain, the ISCST model will be utilized on a daily basis. Daily modeling is necessary in view of the transient meteorological phenomena previously described and the variable nature of fugitive emission sources. Initially, dispersion modeling will be conducted for 180 individual days using the contemporaneous on-site meteorological data and actual emission inventories developed during the period of July 1 through December 31, 1990. Such modeling will be completed by April 1, 1991. Prior to September 1, 1991, modeling will also be completed for 10 days (i.e., 5 days per quarter) during the period January 1 through June 30, 1991.

III. Receptor Modeling

CMB receptor modeling will be used to support the validation of the ISCST model with respect to source contributions. Receptor modeling will initially be conducted at the Firehall and Old Railroad sites for the 25 days at each site having the highest measured lead concentrations during the period July 1 through December 31, 1991. This modeling will be completed by April 1, 1991. Prior to September 1, 1991, receptor modeling will also be completed for 10 days (i.e., 5 days per quarter) during the period January 1 through June 30, 1991.

IV. Model Reconciliation

A validated dispersion model will be developed through a process which reconciles the results of dispersion modeling, receptor modeling and ambient air monitoring over both time and space. Since this process is expected to be difficult for reasons previously outlined, a detailed protocol cannot be established apriori. In general, however, reconciliation will be an iterative process in which the results from both models, together with ambient air monitoring data, are compared, evaluated, modified and compared again until all necessary model corrections have been made. If good agreement is obtained, the dispersion model will be validated or reconciled. If good agreement is not obtained, a decision

with respect to the most appropriate model will be required.

For the East Helena lead SIP, model reconciliation will be conducted at the Firehall, Dartman, Old Railroad and, if necessary, Microwave sites/receptors. This effort will utilize the dispersion modeling, receptor modeling and ambient air monitor data (i.e., 180 days) generated for these sites during the period July 1 - December 31, 1990. These efforts will be completed by July 1, 1991. Thereafter, the reconciled model will be compared with similar data (i.e., 10 days) collected during the period January 1 - June 30, 1991. This comparison will be completed by September 1, 1991 and will define the validity of the reconciled model on a year-round basis.

V. Selection of Control Strategies

To assist with the selection of appropriate control strategies, additional modeling will be completed using the reconciled model, a full year of on-site meteorological data and the maximum allowable emission inventories. Such modeling will be completed on a daily basis at all receptors. The results will then be averaged at each receptor on a calendar-quarter basis, with the highest average(s) defining the "design value(s)". Thereafter, appropriate control strategies will be developed based on the source contributions to these "design value(s)".

VI. Demonstration of Adequacy

To demonstrate the adequacy of the control strategies selected, modeling will be repeated in the same manner previously described except that the maximum allowable emission inventories will be adjusted to reflect implementation of the proposed control measures. The adequacy of the control strategies to attain the standard will be demonstrated when the modeling results indicate compliance at all receptors during all four quarters. The final control strategies, together with a demonstration of adequacy, will be developed by October 1, 1991.

In summary, the SIP development program proposed for East Helena will be based on dispersion modeling as required by EPA regulations, and supported by both receptor modeling and ambient air monitoring. The model will be validated using an extensive array of contemporaneous data collected over a one-year period. Moreover, the program avoids the use of unrepresentative data

collected prior to July 1, 1990, yet allows submittal of a final SIP to EPA on or before February 1, 1992 (see Attachment I). Although substantial resources will be required to complete this program, the resultant SIP should be scientifically defensible and assure the implementation of effective control strategies.

ATTACHMENT I

PROPOSED SCHEDULE FOR LEAD SIP DEVELOPMENT

1. Modify ambient air monitoring network 11/30/89
2. Commence on-site meteorological monitoring . . . 11/30/89
3. Increase ambient air monitoring frequency
to every day 7/ 1/90
4. Reduce ambient air monitoring frequency to
every sixth day 1/ 1/91
5. Complete daily emission inventories for
period 7/1/90 - 12/31/90 3/ 1/91
6. Complete initial dispersion and receptor
modeling for period 7/1/90 - 12/31/90 4/ 1/91
7. Complete model reconciliation 7/ 1/91
8. Complete comparison of reconciled model with
ambient air monitoring and receptor modeling
results obtained for 10 days (5 days per
quarter) during the period 1/1/91 - 6/30/91 . . . 9/ 1/91
9. Complete selection of control strategies
and demonstration of adequacy 10/ 1/91
10. Complete development of draft lead SIP
for East Helena 11/ 1/91
11. Conduct a public hearing on the draft SIP 1/ 1/92
12. Submit final SIP to EPA. 2/ 1/92