PART III

RESPONSIVENESS SUMMARY

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INTRODUCTION

This Responsiveness Summary provides the comments received during the public comment period on the Proposed Plan (the Plan) for the remedy of the East Helena Superfund Site (Operable Unit No. 2) and the responses of the U.S. Environmental Protection Agency (EPA) to the comments. Minutes and transcripts of public meetings are included as are Supplemental comments (and responses) received from local government entities after the public comment period was closed. All comments in this document have been considered in EPA's final decision on selection of the remedy to address the contamination at the site.

The East Helena Superfund Site (Site) OU 2 consists of the smelter, all of the City of East Helena, Montana, nearby residential subdivisions, numerous rural developments such as farms and homes on small acreage plots, and surrounding undeveloped lands. This Responsiveness Summary addresses Operable Unit 2 (OU 2), which consists of non-smelter property surface soils in the residential areas, irrigation ditches, rural developments, and surrounding undeveloped land.

OVERVIEW OF THE PROPOSED PLAN

EPA released the Plan in January 2007, after consultation with MDEQ, Lewis and Clark City-County Board of Health (BOH), and City of East Helena. The Plan describes the cleanup alternatives considered for the site, identified the preferred cleanup alternative, and provided a rationale for selection of the preferred cleanup remedy.

The major components of the Preferred Alternative in the Proposed Plan (and selected remedy in the ROD) are briefly summarized here, and discussed in detail in the Decision Summary.

- Cleanup by excavation and disposal in the East Fields soil repository the existing, qualifying residential yards and vacant lots based on a cleanup level of 1,000/500 milligrams per kilogram (mg/kg) for a residential lot, the exposure unit. When any section of a yard has soil lead greater than 1,000 mg/kg, that yard qualifies for cleanup. Once a yard qualifies, all portions of the yard with soil lead greater than 500 mg/kg will also be cleaned up.
- Cleanup of unpaved streets, aprons, and alleys in existing residential areas where the lead levels exceed 1,000 mg/kg.
- Whenever blood lead tests of a child and a follow-up environmental assessment of a home by health professionals demonstrate that exposure to lead in the soils of that yard is responsible for a blood lead level above 10 ug/dl, then that yard qualifies for immediate remedial action regardless of the yard soil lead concentration.
- Cleanup of those yards where the average soil arsenic concentration exceeds 176 mg/kg (revised to 100 mg/kg in the ROD), but the yard does not otherwise qualify (e.g., no section contains soil concentrations of lead above 1,000 mg/kg), then the yard qualifies for remedial action.

- Cleanup of historic irrigation ditches and water spreading channels that contain lead above 1,000 mg/kg when they are located within or adjacent to residential areas.
- Cleanup of the portion of the railroad right-of-way that is adjacent to residential areas where the lead exceeds 1,000 mg/kg.
- Disposal of excavated contaminated soil at the East Fields soil repository (revised to an EPA-approved repository in the ROD) by means of land application.
- Establish institutional controls (remedy protection measures), that will enable the Lewis and Clark City-County Board of Health and City of East Helena to administer local regulations to protect the selected remedy. Institutional controls are required for residential areas, agricultural lands (such as best management practices), and agricultural lands proposed for development.
- Continue the existing East Helena Lead Education and Abatement Program for as long as long as Lewis and Clark County health professionals, in consultation with other federal, state and local health officials, deem it to be necessary and beneficial.
- Clean up undeveloped land appropriate to the future use when undeveloped land use changes are proposed through in place treatment (deep tilling and lime amendment), excavation, or capping. For undeveloped areas that are proposed for residential development in the future, ensure that soil lead and arsenic concentrations do not exceed 500 ppm lead or 176 ppm arsenic (revised to 100 ppm in the ROD).

SUMMARY OF COMMUNITY RELATIONS ACTIVITIES

The Proposed Plan was published on January 16, 2007, and made available to the public in the information repositories maintained at the EPA Records Center, 10 West 15th Street, Suite 3200, Helena, Montana; the Montana Department of Environmental Quality (MDEQ) Records Center, 1100 North Last Chance Gulch, Helena Montana; the East Helena Lead Education and Abatement Program Office, 2 South Morton, Helena Montana; and the EPA web site at <https://www.epa.gov/region8/sf/mt/east_helena>.

Approximately four thousand fact sheets summarizing the Proposed Plan were sent to residents in the East Helena, Montana area during the month of January 2007. These fact sheets provided information regarding two impending public meetings, and identified locations where copies of the Plan could be obtained. Articles appeared in the local newspaper and a notice was published immediately prior to each public meeting. Copies of the Plan were distributed to selected local officials and interested parties. An original 60-day public comment period starting on January 25, 2007, the date of the first public meeting, was extended by 60 days at the request of several agencies, resulting in a public comment period from January 25 to May 25, 2007.

Two public meetings were held after publication of the Plan. These meetings provided an opportunity for the public to ask questions, discuss their concerns, and provide comments on the Proposed Plan. The first public meeting was held on January 25, 2007 in the East Helena, Montana Fire Hall. Local residents and representatives of the City of East Helena, BOH, MDEQ,

EPA, and Asarco were in attendance. Minutes of this meeting were prepared and are included with this Responsiveness Summary.

A second public meeting was held on March 1, 2007, in the East Helena Fire Hall. Local residents and representatives of the City of East Helena, Lewis & Clark City-County Board of Health, Montana Department of Environmental Quality, EPA, and Asarco were in attendance. A transcript of this meeting was prepared and is included with this Responsiveness Summary.

ORGANIZATION OF RESPONSIVENESS SUMMARY

This Responsiveness Summary contains the following:

- Introduction
- Public Meetings
  - Minutes of January 25, 2007 Public Meeting
  - Transcript of the March 16, 2007 Public Meeting
- Public Comments on Proposed Plan and EPA Responses
- Supplemental Comments and EPA Responses
  - Questions Posed by Lewis and Clark City-County Board of Health
  - Letter from the City of East Helena

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SUMMARY OF JANUARY 25, 2007 PUBLIC MEETING FOR THE PROPOSED PLAN FOR FINAL CLEANUP OF EAST HELENA'S RESIDENTIAL SOILS AND UNDEVELOPED LANDS

Meeting Place: East Helena Volunteer Fireman's Hall, East Helena, Montana
Meeting Time: 7:00 PM
Itinerary: Introduction, Presentations, Questions, Comments

The following transcript was prepared by Pacific Western Technologies, Ltd., from audio tapes of the meeting. The meeting was held in an informal atmosphere and there were frequent questions and responses conducted in a conversational manner. The questioners did not identify themselves so only the question is listed below. The answers were frequently provided by two or more of the EPA representatives. The following summary is not a direct transcription of the audio tapes but rather a summary of the questions and responses.

Introduction

Scott Brown (US EPA) – Opens meeting, welcomes attendees, introduces Dr. Susan Griffin and Dr. William Brattin, and summarizes purpose of the meeting, Proposed Plan, and Record of Decision. The purpose of the meeting was to discuss the risk assessment and the setting of an appropriate action level for lead cleanup of residential soils and undeveloped lands in East Helena.

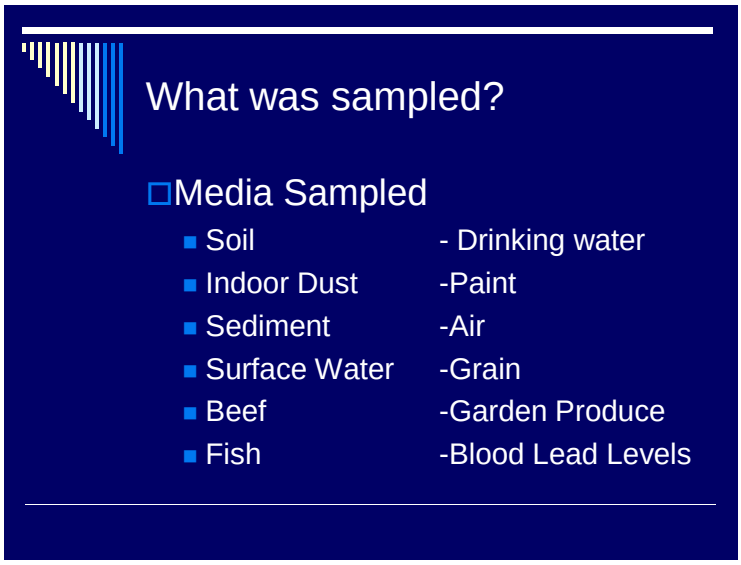
Presentations

Dr. Griffin (US EPA) – The site has been sampled extensively since 1983. Lead, arsenic and cadmium were identified as the contaminants of concern for the East Helena site. Receptors of concern are the children and adults living in the community. The exposure pathways of concern include ingestion of soil, indoor dust, surface water and sediment, groundwater, drinking water, vegetables, fish, beef, and grain; inhalation of airborne dust; and dermal exposure to soil and sediment.

Assessment of exposure may be completed through direct measurement by collection of blood and urine samples. Direct measurements provide a reliable method for assessing current exposure. Do not have to make assumptions of what the sources are or how much of the source is assimilated into the body. Some disadvantages of direct measurements are that there may not be benchmarks with which to compare the direct measurement, and that the data only represent recent exposure. We have benchmarks for lead and after about 60 days the children become equilibrated to the lead in their environment. This suggests that for children who have lived in the community longer than 60 days the available blood lead data are representative of the exposure that is occurring within the community.

Another way to assess exposure is to model it. One model is the IEUBK (Integrated Exposure Uptake Biokinetic Model). The model inputs are based on reasonable maximum exposure. Advantages of models include that they are not invasive (do not have to sample children's blood), that they can look at alternate land uses, and that they can identify different sources of exposure. The disadvantages of models include accuracy of assumptions, and that models often do not reflect what is actually happening. For example, one assumption is that the blood lead concentration is correlated to the soil concentration. A plot of blood lead concentrations by the soil lead concentrations in East Helena shows that there is no correlation.

To assess risk the preferred approach is to use the direct measurements coupled with site-specific public health and regulatory models to identify elevated blood lead levels, sources of blood lead levels, and develop a remedy that will be effective in reducing the blood lead levels.



What was analyzed for?

- Inorganics commonly associated with mining and smelting related wastes
  - Antimony, Arsenic, cadmium, chromium, copper, zinc, lead, manganese, mercury, selenium, and silver
  - Lead, arsenic and cadmium selected as contaminants of concern

Who is exposed and how are they exposed?

- Receptors
  - Children and adults living in the community
- How are they exposed?
  - Ingestion of soil, indoor dust, drinking water, sediment, surface water, groundwater, garden produce, fish, beef and grain
  - Inhalation of airborne dust
  - Dermal exposure to soil and sediments
  - All of these exposure pathways were evaluated for residents living in the community

HOW MUCH ARE PEOPLE EXPOSED TO?

- Direct Measurements
  - Collect and analyze biological fluids, such as blood or urine, for chemicals
  - Compare results to known medical benchmarks

HOW MUCH ARE PEOPLE EXPOSED TO?

- Advantages of direct measurements
  - We know exactly what current exposure is
  - Don't have to make assumptions about the sources of exposure or how often or how much people contact that source
  - Health professionals combine direct measurements with epidemiological tools to identify sources of exposure

HOW MUCH ARE PEOPLE EXPOSED TO?

- Disadvantages of direct measurements
  - Don't have medical tests or benchmarks for most chemicals
  - Invasive
  - May reflect only recent exposures

MODELING EXPOSURE

- Uses equations to estimate how often and how much people contact a given media to derive a site-specific estimate of exposure
- Inputs to the equation represent high end or "reasonable maximum" exposures

- Intake =CxIRxEFxED/BWxAT
- c=concentration
- IR=intake rate
- EF=exposure frequency
- ED=exposure duration
- BW=body weight
- AT=period over which exposure is averaged

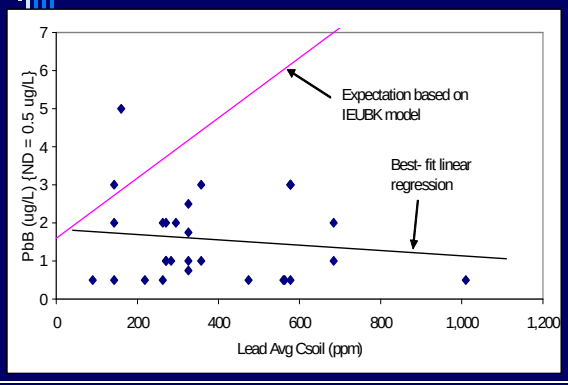
MODELING EXPOSURE

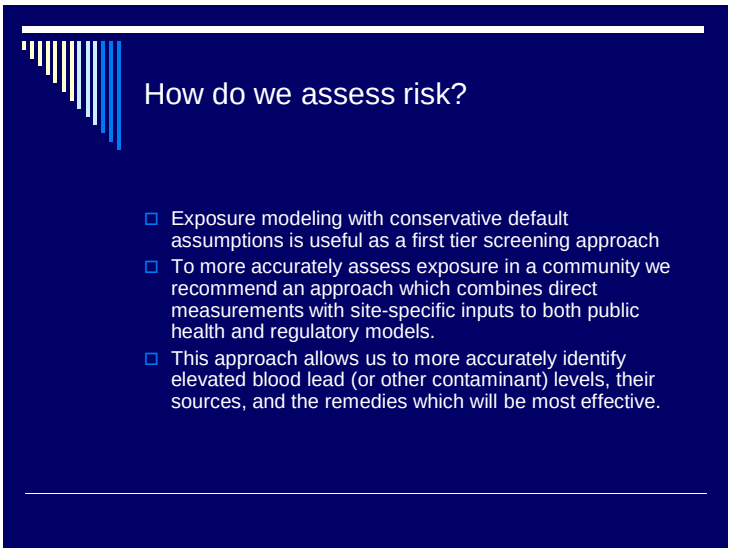
- Advantages of modeling approach
  - Non-invasive
  - Can assess alternate land uses in the future as well as current ones
  - Can identify sources of exposure
  - USEPA uses this approach

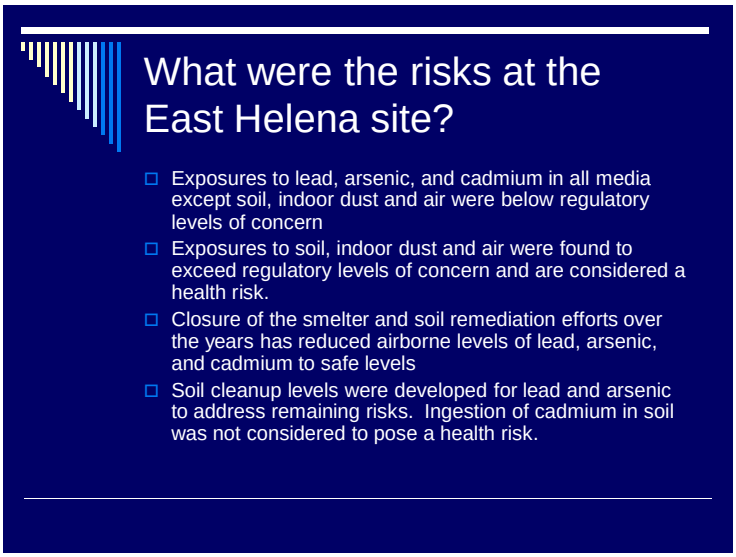
MODELING EXPOSURE

- Disadvantages of modeling approach
  - Must make assumptions on sources of exposure, contact rates and frequencies
  - USEPA policy dictates that these assumptions are based on the most susceptible individual who receives the maximum exposure which is plausible, therefore, the results are conservative
  - The models used are useful screening tools, but may not always be sophisticated enough to accurately reflect real life exposures

OBSERVED vs PREDICTED



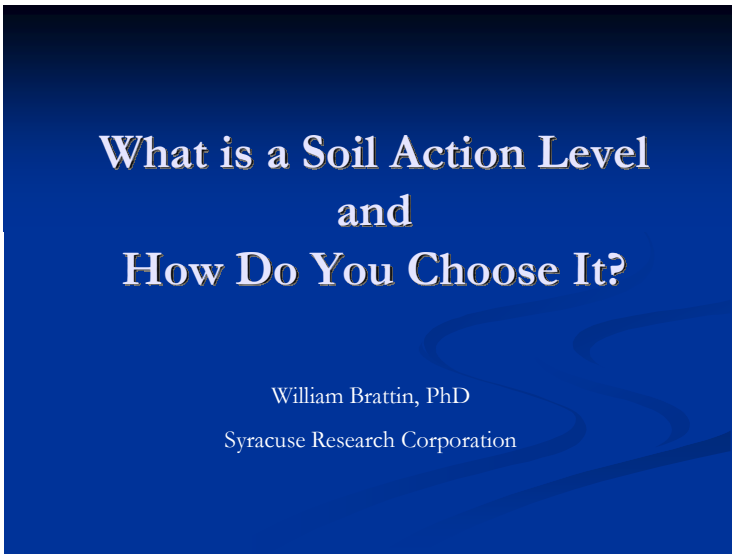




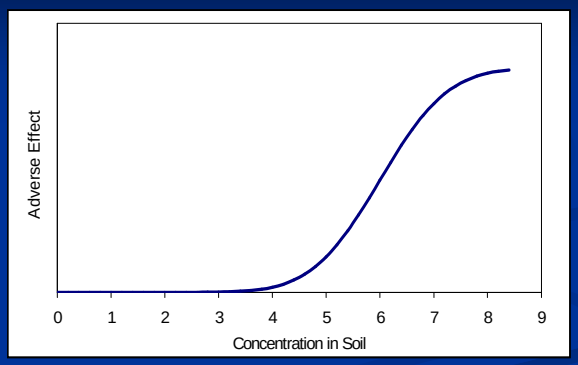
Dr. Brattin (Syracuse Research Corporation) – The EPA-proposed action level for lead in residential soils is 1,000 parts per million (ppm). The most important principle is the concept of the dose-response curve. The shape of the line for the dose-response curve for most non-carcinogenic effects is as represented on the displayed figure. The most important point on the curve is where an effect starts to occur. This point is known as the threshold concentration. The action level is targeted to the threshold concentration. At most sites the dose-response curve is unknown. At East Helena the IEUBK model results in an action level of 520 ppm for lead. The degree of uncertainty in the assumptions used in the IEUBK model was evaluated. The uncertainty evaluation demonstrates that the IEUBK model results in a concentration (520 ppm) that is very conservative and almost certainly protective. Other data are available for East Helena and may be used to assess whether the IEUBK model result is appropriate. First, if the IEUBK model was correct, the blood lead levels in children in East Helena should rise as the lead concentration in soil increased. The blood lead and soil lead data from East Helena show that there is no correlation. This indicates that the IEUBK model is overestimating the importance of

lead in soil as a source of exposure in children in East Helena. At East Helena, there is no longer an observed relationship between soil lead concentrations and blood lead concentrations. Furthermore, a plot of blood lead data grouped in 2-year periods shows that there has been a pronounced drop in blood lead concentrations over time. The reasons for the decrease are likely (1) federal programs to reduce exposure to lead in gasoline, paint, solder, and food, and (2) the actions that have been taken at the East Helena site like capping airborne dust source areas, cleanup of lead in soil, and the education program. The plot of blood lead data grouped in 2-year periods also shows that blood lead concentrations in East Helena are low. If the IEUBK model were correct between 5 and 15 percent of the children in East Helena should have elevated blood lead concentrations. The existing data show that in the last 5 years no tested child has had a blood lead concentration greater than 10 [µg/dl].

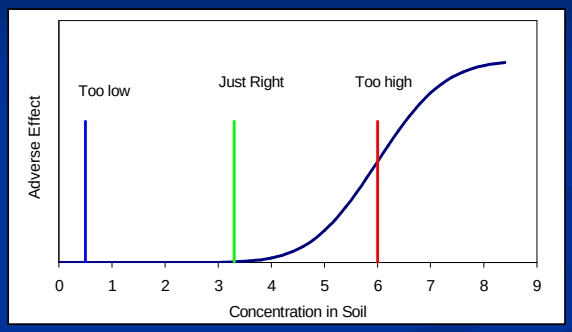
Dr Brattin concluded that the 520 ppm action level computed by the IEUBK model is lower than is required or necessary to protect public health. The levels of lead in soil that remain in the community today do not cause an observable increase and we can not detect its effect on the blood lead levels of children. Whatever the continuing contribution of lead in soil is it is so low as to be of no substantive public health concern. The action level proposed in the Proposed Plan (1,000 ppm) is fully effective in achieving its goal.



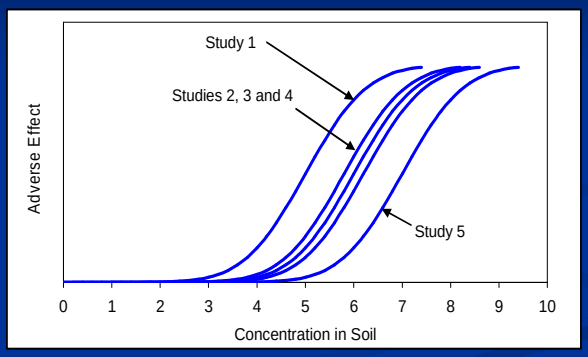
Basic Concept: Dose-Response Curve



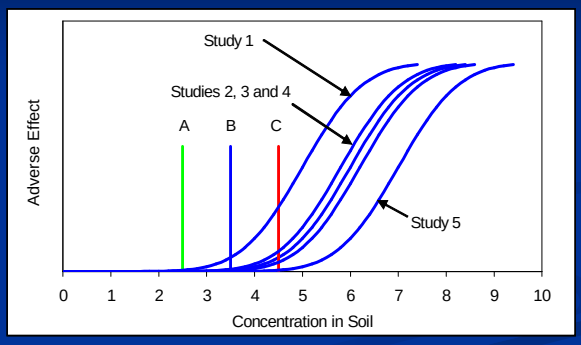
Question: What soil concentration is should be picked as the Action Level ?



What if The Data Are Not Consistent?



Now What Action Level is Best?



EPA Approach

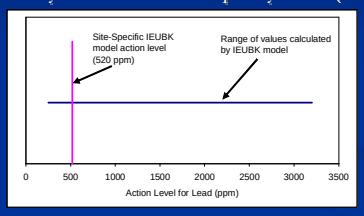
- In the absence of other information, err on the side of caution: Choose Action Level A
- Advantages: Will provide protection, even if the toxicity is a high as reported in Study 1
- Disadvantages: Action Level A is probably lower than really needed (4 out of 5 studies indicate this); may result in wasted resources

ACTION LEVEL FOR LEAD

- Action Levels calculated by EPA's IEUBK model are like Choice A:
  - Definitely protective
  - Probably lower than needed
  - Appropriate when no other information is available

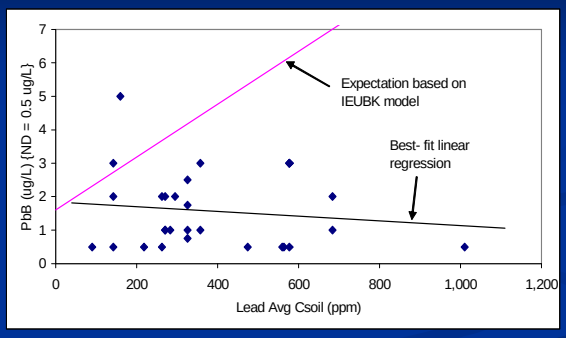
What About East Helena?

- Action Level based on IEUBK model = 520 ppm
- Uncertainty in calculations is pretty wide (250-3200 ppm)

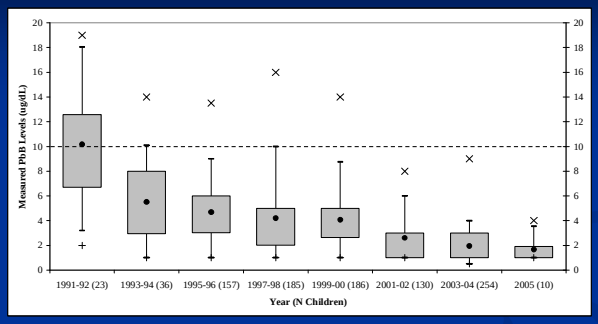


- In absence of other information, Action Level would probably be about 520 ppm
- However, blood lead data suggest IEUBK model is over-predicting risk from soil

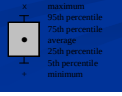
OBSERVED vs PREDICTED

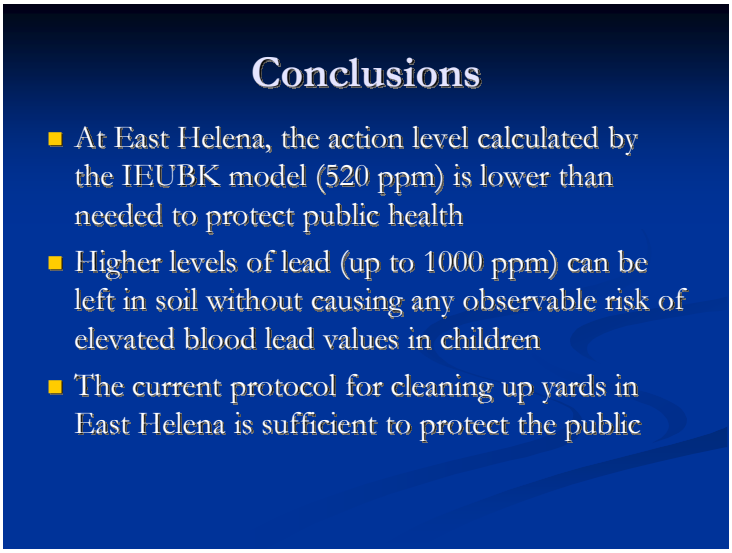


Time Trends



Restricted to children age 6-72 months.
PbB values reported as <1 ug/dL evaluated at 0.5 ug/dL.
If multiple PbB measurements are available for a child within a year, the mean PbB value across samples was used.





Questions

Question – While lead concentrations are going down partly due to remediation are they also going down due to the lead being pushed down into the soil by rain? Does the lead migrate down and at what time do we have to worry about the lead entering our water systems or wells?

Answer – In general lead is immobile in soil. Concern over lead in groundwater is low. If there are continuing concerns over lead in groundwater the groundwater can be tested. Rain can wash lead dust into the soil but the lead will not go very far (1 to 3 inches) into the soil. Lead will form mineral complexes in the soil which will act to stabilize the respirability of the lead.

Question – I own 6 acres of land in East Helena that borders Highway 12. 77% of the soils are above 1,000 ppm [lead], the highest 3,300 ppm. Is that soil a hazard to the community?

Answer – Because lead is relatively stable in soil, unless it is blowing (which it is) that is the only way that the high levels might impact nearby locations. We could calculate how much soil would need to erode to impact surrounding properties.

Question – What you have just shown us with your data is that that property is having no impact on the city. Am I correct?

Answer – If the property is undeveloped and there is no child lead data there is no way to assess whether there would be an elevated risk to future child residents. The IEUBK model would suggest that there would be an elevated risk. Direct observations might demonstrate that there is risk. At this time concentrations greater than 1,000 may result in an elevated risk to future residents.

Questions – I have an undeveloped parcel of land in the City of East Helena with lead concentrations above 3,000 ppm. I have subdivided the land and would like to sell the parcels. Are you going to

clean it up? Why do I or the purchasers of my property have to pay to clean up ASARCOs mess? Will I be liable if I sell the land?

Answer – Under the Proposed Plan ASARCO will not be required to clean up undeveloped land. There are several alternatives in the proposed plan that may be used to cleanup the land. There is no answer about liability until the ROD is approved.

Question – If the smelting over 100 years has resulted in the top 3 inches of soil being contaminated, if you rototilled the top foot, it would reduce lead concentrations below 1,000 ppm. Why not do that?

Answer – The depth of contamination may be 3 inches; it may be 4 or 6; but it is not 20 feet. Tilling the soil is an option that has been considered at this site and others.

Question – And you have done it on several areas. Is that correct?

Answer – It has been completed in several areas as a demonstration and it is offered as one of three alternatives for undeveloped lands.

Question – Tilling the land would be a viable option for the previous questioner?

Answer – Assuming that after we get through the public review process that all the alternatives for undeveloped land survive the review. There may be portions of the Proposed Plan that are not acceptable to other enforcement agencies or the community.

Question – There are going to be separate acceptable levels for residential, recreational, and commercial. What is the acceptable level for recreational use and define the recreational uses?

Answer – Recreational and commercial uses are different from residential use because residential use assumes that young children will be present while recreational and commercial uses assume that young children will not be present at all, or present infrequently. There are also differences in the assumptions of how frequently people are exposed and how much soil they will ingest. The commercial action level in the Proposed Plan is 1,300 ppm and the recreational action level is 2,800 ppm as an average over an area.

Question – What is a recreational use?

Answer – Hiking, camping, hunting.

Question – We are talking in town. Are we talking about parks?

Answer – Yes.

Question – Are school playgrounds treated as recreational?

Answer – Schools are generally treated as a stand-alone category because of the high certainty that young children will be present. Years ago ASARCO and EPA agreed that all the schools and parks in town will be cleaned up to residential level.

Question – You cleaned up the schools without testing them?

Answer – We tested them but were sure going in that the residential action level would apply. All the parks and schools have been cleaned up and the levels that remain are typical of those found near the Lake Helena area – between 60 and 80 ppm lead.

Question – Could you go back to the regression slide that showed blood lead and soil concentrations? Where did you come up with 1,000? There are no data shown at higher soil lead levels.

Answer – There are no blood lead data available where soil lead concentrations are 2,000 to 5,000 ppm. It might be possible to use older data to add to the diagram. 1,000 was selected as an interim action level.

Question – The risk assessor have made the point that the 500 ppm action level is to low. Why do you agree to the 1,000 ppm action level?

Answer – Because today the community is largely in the state that it will be in if 1,000 ppm were accepted as the action level. If the 1,000 ppm action level was not protective and a 500 ppm action level was required then the blood lead data would not be where they are. They would be up. We would be seeing kids with blood lead levels above 10.

Question – Out of the hundreds of blood lead measurements there are only 30 or so shown on the figure. How were those data points selected?

Answer – The data points are all children blood lead concentrations where we also know the soil lead concentration at the time the blood lead concentration was measured.

Question – The few samples shown seem like a weak database.

Answer – The data shown are only a small fraction of the available data. We do know the soil lead concentration in yards across the community. We do know the blood lead levels of the children in the East Helena area. You can put those two together to get a much larger database. What the figure shows is that the direct relationship between soil lead and blood lead in the IEUBK model does not always hold true and tends to over-predict blood lead levels.

Question – Then you have many more data points that could be shown?

Answer – We have lots more soil lead and lots more blood lead but the data are not paired. We do not have a lot of matched pairs. This data set while not complete is a statistically valid number of samples of a child's blood lead and soil lead level from where that child was living. In 2006 [I got data for] another 157 children and we developed another database where we had these matched pairs and if we wanted to incorporate those into the figure. I am almost certain that they would lend greater significance to this lack of a relationship. While we did not apply them statistically you can look at them and see that there is no relationship. There were 3 kids out of 157 with blood lead above 4 µg/dl and the soil lead levels were all 200 to 300 ppm up to 600 to 700 ppm and yet all the blood lead levels were low.

Question – That could also be that the kids were living in an older house or newer house.

Answer – That is why there is a lead education and abatement program that takes it to the next step. If there is an elevated blood lead concentration the County lead program tries to find out why. Is there lead paint, hobby, or pica child? Is it related to the soils? They have been unable to find any situation where the yard soils are a significant source.

Question – Do you think that the additional data should be added to the figure?

Answer – There are 60 some matched pairs. The figure should have been updated. More data are better.

Question – What do the dots on the figure represent?

Answer – The dots represent the blood lead level of a child at the average yard concentration.

Question – The blood lead standard is 10 µg/dl. There are some organizations that feel this level is too high. Do you have any comment?

Answer – There is a lot of debate in the scientific community as to whether the 10 µg/dl is too high. It is widely believed that neurological effects of lead have no threshold. Can we clean up to zero? No, it is impossible; there are too many sources of lead including diet, air; multiple sources. As a matter of policy the regulatory community must establish some type of level at which to take action. And for blood lead the CDC, EPA, and medical community have established 10 µg/dl as the level of concern.

Question – Did the CDC propose lowering the level of concern at one point?

Answer – It has been considered but at this time the level has not been changed. After the ROD has been signed the Superfund process has a Five-Year Review to evaluate whether the remedy is successful and if there have been any regulatory changes. If the level of concern is lowered in the future the remedy would have to be reevaluated and potentially modified at that time.

Question – Based on last years testing (of blood lead), how do our kids compare to the national average of lead levels?

Answer – The national average is 1.7 µg/dl and the East Helena average for children 6 years old and younger is 1.3 µg/dl.

Question – Is that only of the children that have lived here before? Or is it including children who moved in at age 3?

Answer – The data include all children who have been tested even if they moved in 2 days before testing.

Question – Is taking an average of the soil concentration from the four quadrants typical of the way EPA address other sites across the nation?

Answer – About 10 years ago EPA nationwide got together to decide how to sample yards for lead sites and how they were going to evaluate the risk. It is fairly standard to divide yards into quadrants and composite samples and look at the average for the yard.

Question – Can you define quadrant?

Answer – The average yard in East Helena is a small property. The yards in old East Helena proper are generally less than 8,000 to 10,000 square feet. When a yard is that size it is divided into 4 quadrants. In the agreement that DEQ, EPA, and ASARCO had, three samples would be

collected from each quadrant and brought together or composited. This would result in four numbers, [one] for each of the four quadrants. Let's say that you had 800, 200, 150, and 2,000 ppm; and it is not an exaggeration. You rarely find a yard that is 700, 600, 400, 800 ppm. I could show you hundreds of yards that are so variable that you wonder what is going on there. But when you average the yards, after the cleanups that have already been completed, you rarely find a yard that has an average that is greater than 700 or so. We talk about an action level of 1,000 for East Helena. That action level is based on quadrants. It is a conservative approach. If one sample in a yard is above 1,000 ppm the entire yard is cleaned up to 500 ppm. This approach was negotiated in 1991 between ASARCO, the community, county, DEQ, and EPA. There were a lot of yards 8,000 to 9,000 ppm and they are all gone. They were all cleaned up. The flour consistency concentrates that used to be outdoors and blow into town are gone. The streets have all been swept. Now the plant has closed and the air is no longer a concern but the yards are cleaned up if any portion is above 1,000 ppm. The average concentration of yards yet to be cleaned up is 700 to 800 ppm.

Question – The concern with quadrants is that some lots are 6 acres. How would you break that up?

Answer – On undeveloped land every other acre is sampled. Each sampled acre has 16 sub-samples collected and composited. Much less intensive sampling therefore there is much more uncertainty than compared to yards. At La Casa Grand or Eastgate the yards are sometimes 30,000 to 40,000 square feet. What we do is divide the yard into 60 by 60 foot sections and then in every section composite samples are collected. There are some yards in the outlying areas that are one quarter to one half acres that are developed where there are 40 or more samples.

Question – Are the concentrations generally less when you get further away from the smelter?

Answer – They are generally less but until you look at yards neighborhood by neighborhood there are some baffling things that we know are there but cannot explain them. For example, years ago there were water-spreading ditches that spread out across the north end of town and we have found very high arsenic and lead levels. We sort of stumbled onto them in areas where we did not expect to find anything.

Question – Do you think they washed out there?

Answer – They washed out of the plant at the time when fine concentrates were stored outdoors. Floods came and washed them down the stream and deposited them in fingers in the water-spreading ditches. They were deposited way out by Canyon Ferry Lake.

Question – One of the things you mentioned in the Proposed Plan was that there was going to be some kind of remediation around the irrigation ditches. I have property north of East main and there is a ditch that runs out towards Eastgate. Are they going to take the ditch out?

Answer – No. We know the areas with flood waters that may have received concentrates from the plant. In the 1960s and the floods in the 1980s we know that there is a high probability that there is some deposition of lead and arsenic in those areas. They need special attention and have not been fully characterized. We are proposing that they will be treated separately from the yards.

Question – How often do you sample?

Answer – We sample a yard once.

Question – If you sample a yard once before the plant closed is that good enough?

Answer – Those yards that have been cleaned up we take about 10 percent of them and sample them again. It is called confirmation sampling to ensure that when the plant was operating the remediation worked and the yards were not being re-contaminated.

Question – Do you continue to knock down the stack?

Answer – We continue to do that each year. We take a percentage that have been cleaned up and resample them. We have not seen any changes over time.

Question – Is that the five-year review you mentioned?

Answer – No. We do it every year. The contamination was deposited over 100 years and there are few changes over the last 10 to 15 years.

Question – I got one here that says 13 years ago with one concentration of 966.

Answer – I don't know your individual property.

Question – You said sorry, tough. We don't care if your little boy is playing in the yard.

Answer – We never said tough. We have an action levels and now is your opportunity if you feel they are not suitable, we invite your comment.

Question – Back at the very beginning you were talking about your modeling. You mentioned that you used default site information values. Could you talk a little bit about the default site information?

Answer – I'm not sure what part you are talking about.

Question – It was back when you were talking about the children's lead model. You mentioned that you used default values. Given that there is so much data available for this area why wasn't this data used? Why did you use the IEUBK model with default data when there are other models that could use that would take into account all the data? If you say that the IEUBK model is not working and that 520 ppm is not the correct number and that 1,000 is acceptable what would the other models say that have more data?

Answer – When we were screening out all the other analytes the IEUBK model and other children's models were used with the default values in it. As such it is a conservative screen meaning that anything that is below it is clearly not a risk. Anything above that number is something that we are going to evaluate further using community-specific and mining and smelting-specific information. That was the first step. The most recent application of the IEUBK model at this site does utilize all the reliable site-specific data that we can obtain. When you apply the IEUBK model using all default data and no site data the action level is 400 ppm. That is the national default number. At this site EPA invested the effort to collect additional data of two main types. The first is how well the lead in the soil is absorbed. The lead at this site is absorbed somewhat more than is assumed by the default IEUBK value. That has the effect of pushing the action level down. But we also collected data on the lead levels of indoor dust. The IEUBK model assumes as the default value that the lead level of indoor dust is 70 percent of that in outdoor soil. For example, if the outdoor soil lead concentration is 1,000 ppm the IEUBK

model assumes that the indoor dust would have a lead concentration of 700 ppm. The direct measurement shows that that is a substantial overestimation. We have observed this at many sites. On average the relationship between soil and indoor dust is between 10 and 40 percent with 20 to 25 percent being common. At this site we found a value of 17 percent. When you add the 17 percent value to the model it drives the action level back up to 520 ppm. Those are only two of the things that go into the IEUBK model. If we could we would measure the amount of soil and dust ingested by children but that project is of such incredible difficulty, cost, and complexity that it was decided to be infeasible. We have collected the data on the things we can collect it on that is feasible and that is why the number is 520 ppm and not 400 ppm.

Question – Since you addressed the second part of my question as why this model [audio indecipherable]. Are there other modeling techniques out there that were used?

Answer – Yes there were. When we were talking earlier about the blood lead data what we were advocating is a combined weight of evidence approach that utilizing the blood lead data, the blood lead model with community specific and smelter specific inputs, and statistical and epidemiological models which look directly at the relationship between the blood lead levels and different sources of lead. Bringing all these tools and all this experience together is how we arrived at the conclusion of a 1,000 ppm cleanup level with the confidence that is was going to protect the public.

Question – The 10 µg/dl number you haven't really talked about, especially with an action level of 1,000 ppm, of the chronic effects of exposure to low levels of lead to children. This gentleman over here has 900 ppm lead in his yard and with young children may be pushing it. There are also differences in children themselves. This is saying that all children are statistically the same with lead uptake.

Answer – We are not. As I mentioned before we are looking at the most susceptible members of the population which are children less than 7 years in age. Older children and adult need to have much larger doses of lead to see the same effects. One thing in the model is a parameter that looks at the variability among children as a result of physiological differences and behavioral differences. I talked earlier about the bell curve and how by law we are required to focus on the people on the high end of the bell curve. This parameter for variability requires us to go to the high end of the curve and look at the children who are getting the most exposure who have the behavior that brings them into contact with lead the most and have the physiology that would allow them to absorb the most. So we are accounting for the variability of children.

Question – If 520 is not the number and 1,000 is the number would a number in between be a better alternative? The alternative 2R and 3R that is the 1,000 down to 500, would some level in between or a mixing of the alternatives be more appropriate?

Answer – I think it is important to separate risk considerations from risk management considerations. If you believe that the weight of evidence is sufficient to conclude that 1,000 is protective and that is not uncertain, there would be no clear benefit to choosing an action level below 1,000. If you say that there is substantial uncertainty that 1,000 is protective then you could conclude that a lower action level would be appropriate. This argument comes down to an issue of confidence in the observations and understanding as to why they are inconsistent with the predictions. And deciding whether a prediction based on a model that uses a lot of the inputs that you would be surprised how weak some of them are or would you prefer to lay your confidence on the observations. When assessing the observations you must ask how good are the observations. Twenty-five data points does not seem like much. That is a valid point. This is

another point where judgment enters the evaluation. How much evidence is required? We do not have just 25 data points. We have 25 or now about 50 paired data points. We have over 1,000 blood lead data points and thousands and thousands of soil lead data points. So don't get too focused in on the graph. One of the arguments that is often made is that the blood lead data are not representative so they shouldn't be relied upon. I believe that by looking at the map to see where the samples were collected to see that the blood lead data cover the spectrum of the community. Can there be difference of opinion between individuals as to how much confidence to place in the data? You bet. That is where the judgment comes in.

Question – There has been a very good education program. What would the model results be if there were no lead education program? Might those blood lead levels be up higher?

Answer – One of the studies that I have been involved with was the Three Cities Study – Boston, Baltimore, and Philadelphia. The purpose of the study was to look at how effective education alone is for reducing blood lead levels, environmental abatement alone would be, and a combination of the two. One of the findings was—these were not kids with low blood lead levels, these were kids with high levels from lead-based paint dust in the homes etc.—was that blood lead levels dropped in the first year for education alone; however, by the second year they started to go back up again. When you combined environmental abatement with education the lead levels stayed down. But education alone will not keep blood lead levels down. What I find comforting here is that we have serial blood lead studies going back to 1994 or 1995 that are showing this trend (downward). I don't believe that education alone is doing this. I think there are a number of factors here including the federal program to reduce lead in gasoline and lead-based paint.

Question – When did that occur?

Answer – I don't remember exactly. The late 70s or mid 80s, somewhere in there.

Question – I think it was 1976.

Answer – Just because the law was passed in a certain year doesn't mean it was instantaneously out of the environment. In fact leaded gasoline was still available for much of the 80's. The combination of federal regulations, reduced smelter emissions, and yard removal has resulted in reduced blood lead levels.

Question – On the regression of the soil lead to blood lead data you have the yard average. What does the graph look like when you use the highest sample from the yard? Does it show an upward trend?

Answer – I don't think I have generated that. We could generate it. I would be surprised if it would show a clear pattern. I think if anything it would be more nearly random. I will generate that graph.

Question – You spoke in your presentation about how you used a model to come up with your action levels for East Helena. I am curious why you are dismissing the model understanding that you have site specific data. But it also seems to me that based on what I believed I heard about action levels that the 1,000 ppm action level was developed in the early 90s based on the fact that there were a lot of properties to clean up. And I haven't heard that the action level is based on anything risk based other than that you can correlate it to your blood lead data and that you don't think you see an increase so it must be OK. I find it interesting that you used this model to predict what you

are going to use a cleanup levels on all other sites that you would still simply dismiss it here and double your cleanup level. I am curious as to why you would dismiss the model?

Answer – There are a couple of question in there. The first is that I am not dismissing modeling approaches. It is what EPA prefers because at a majority of sites we collect very little data and hence we will use the little data that we have along with generic national default values in the model. Are we cleaning up more than we need to? More than likely. Do I have information to move away from that? No. So when there is all kind of doubt, when the information is simply not available we need to be prudent and conservative. However, when we do have community specific information and information specific to mining and smelting sites we have confidence to move away from the default position and that is what I was advocating here. We don't need to rely on a generic out of the box model and apply it to everyone. It is very conservative. When we have reliable blood lead data, when we have site specific information, we can use a variety of other tools to look at a strong weight of evidence approach.

Question – Do you want to use site specific information? I though that you said that you used site specific information in the model?

Answer – That's true, but it is for a short list of the inputs. I have never counted how many inputs are required to run the model, but it is a long list. We filled in a few of the ones we could alter but the rest remained default values. The amount of soil ingested remains default and, while I may be going beyond what I could defend if pressed, I personally think that is the input parameter that is most suspicious, most likely to account for substantial disagreements between the direct observations and the predictions. It happens to be a parameter that we have no capability of doing anything about.

Question – Aren't there studies that show when you have lead in your system it never leaves your body but that it migrates from your blood into your bones?

Answer – Pharmacokinetics of lead have been extensively studied. Once lead in absorbed into your system it will be absorbed into your bone matrix and different tissues. Over time you come into equilibrium with your environment. If you have a very low lead environment you will tend to excrete the lead in either urine, feces, skin, hair, nails but you will never get to zero. There is always a background level of lead that you are exposed to. Every time you eat something there is a small amount of lead. So there will always be a small amount of lead in your blood. And the lead that is in bones will tend to stay there until you have some stressful event like childbirth. If you have a lot of lead stored in your bones it may come out in childbirth. If you loose a lot of weight that may cause lead to come out of the bone. But the general rule is that you come into equilibrium with your environment.

Question – So if it comes out of your bone will it go back into your blood?

Answer – It will go back into your blood. In the past when mothers had very high blood lead levels, on the order of 20, 30, 40 µg/dl, there was a concern that the fetus could be exposed—where lead would come from the bone and pass through the placenta to the fetus.

Question – When you are relying on these tests of the blood lead levels that is only a snapshot of that point in time?

Answer – It is an idea of what your blood is in relation to your environment. If someone has lived in an environment more than two months then that gives us a good idea of what the sources of lead exposure to you are.

Question – How long does the lead stay in your blood? If I ingest something that had lead how long would it stay in your blood?

Answer – First of all it in important to recognize that the adverse effects of lead are generally thought of being the result of long-term exposure as opposed to a short pulse of exposure. That isn't to say that if you had a short high pulse there might not be a problem. It is just that the toxicological community doesn't have any clear idea as to how to deal with that and so when we talk about 10 µg/dl it is not a never-to–be-exceeded or something bad will happen. That is, a long term average of an individual should be less than 10. If you happen to be an individual with a low exposure and your blood lead was normally low, 2 to 3 µg/dl, and you underwent some event where you had high exposure your blood lead would rise over a day or two. Then if your exposure were just that one event your blood lead would fall back to where it was or slightly higher with another 2 to 5 days. The kinetics of how blood lead levels change over time has been well studied both in humans and in animals. It does not respond instantly. It responds rather slowly compared to other things like alcohol. It responds over a matter of days to weeks. Nevertheless, it does change. As your typical lead exposure changes your blood lead levels will also change accordingly.

Question – It sounds as if lead has a relatively short residence time in blood. Would it be true if you are sampling children you would want to be sampling them during the time of greatest potential exposure to dust, meaning summer or the dry season?

Answer – That is often an important consideration in the design of a blood lead study. You typically, if you are only going to sample once, you would sample in late summer or early fall, because it is considered that that is the time of year when outdoor exposure to dry soil will be at a maximum. Studies have been done to see how different it would be if you collected them in the middle of the winter. Depending on the quality of the study you can definitely see some trends but it isn't a roller coaster; it is a gentle roll. If the community wide average is 5 in the summer it is 4 in the winter. It is an issue and that is why blood lead studies are typically timed for the peak exposure so that you don't over look anything. But you shouldn't think of that as something that is an absolutely critical element. You have blood lead data collected in March or December it would be pretty representative.

Question – You said that the 10 µg/dl level is based on long term exposure. What do you mean by long term?

Answer – Like several years in the life of a child. When the IEUBK model is applied it computes the average blood lead from age 0 to age 6. During that time the blood lead levels will be fluctuating as the body weight changes, as the behavior of the child changes. The IEUBK model assumes, without much data, that children aged 2 to 3 ingest more soil than children aged 1 or 4 and 5. The model has age specific inputs. If you examine blood lead as a function of age it sort of wobbles around and it is a little higher at ages 2 and 3. What the model reports out as the key parameter to determine whether you have a problem or not is the average.

Question – So if a child had high blood lead for a year of their life and it was fairly low at other time the average could well come below 10.

Answer – I would never personally say that is OK. And I doubt there is anyone in the lead risk assessment community that would say that 30 for a year was nothing to worry about. The EPA and federal agencies don't have firm toxicological basis for knowing how to deal with transient health issues. One way, highly conservative, would be to say the highest it ever gets is 10 then the average must always be below 10 and therefore you are safe. So every once in a while when you are worried about short-term transient exposure that you think there is going to be a spike, I have seen cases where people say I don't know how high is a problem but I know if it doesn't get higher than 10 it isn't a problem. We need to keep the adverse effects in perspective too, because in studies of children 2, 3, 4 years old we know that blood lead levels of 10 to 15 µg/dl are associated with IQ deficits of 1 or 2 points, short attention span, and hand-eye coordination. You can see small statistically significant differences between populations but you can never tell on an individual. So all we can say is that children that we have measured in those age groups have shown those small deficits. What we do say as a general rule is that anyone [with a blood lead level] above 10 µg/dl is unacceptable and we want to bring that down. Whether that occurs over one year, two years; I don't know. I don't know if anyone can tell you but we just say that if you measure it one time it is too much, and has to come down.

Question – Back in 1975 and 1983, 90 children and then a couple of hundred children were tested. In 1975 the average blood lead level was around 30 µg/dl and the average blood lead level of children in 1983 was around 20 µg/dl. Two thirds of the children were above 10 and one third were above 15 µg/dl. What of those people?

Answer – Anyone growing up in the 50s, 60s, 70s, your average blood lead level was between 15 and 20 µg/dl.

Question – Right now?

Answer – When you were children in that time period.

Question – Are the graphs up there of East Helena?

Answer – In general, Yes.

Question – With 2000 you have a little 10 next to it and then 2005. What is that?

Answer – That is the number of individuals observed in that year.

Question – I am trying to grasp the significance.

Answer – This is a graphical summary of the blood lead data collected from 2000 to 2004. The data set of blood lead levels shown in this graph, which I believe is restricted to children 0 to 6 years old, there may have been more blood lead levels collected but older children are less susceptible and of less concern so we focused on the most susceptible 0 to 6. There were 254 of them. How should I summarize them for you? This is the lowest value of the 254, this is the highest of the 254, 90 percent of all the values fall within those two lines, and 50 percent of all the values fall between these two lines, and that is the average. This is another graph that I should have updated. In 2006, there were 157 and if they are combined with the 2005 data there are 170 data points. And it stays very low.

Question – How do these data compare to other sites you have experience with?

Answer – Better.

Question – Can you be more specific about where and how many kids participated?

Answer – The site I am most familiar with is the Leadville, Colorado site, where a similar community blood lead program has been in place. At that site the soil action levels is 3,500 ppm. Because that level was higher than people were accustomed to a community program was put in place to monitor the blood lead levels to guard against the possibility that the 3,500 was a bad choice. If so what would have happened is that what we would have seen is the blood lead levels staying high. But just like here they fell partly due to actions at the site and partly due to national actions. We developed a rather complex statistical procedure for declaring how good is good. This (East Helena) would have passed in the first test. At Leadville, it took 5 years. And they just now—after 5 years of continuous cleanup driving down the lead levels—they passed.

Question – The residential action level was 3,500 ppm?

Answer – Yes. We have another mine site in Aspen, Colorado which had soil lead concentration in excess of that. The community did not want a remediation program but what they agreed to was 3 year blood lead monitoring program. At the end of three years if all kids were below the 10 µg/dl EPA agreed to leave town. And that is what we did. For three solid years not one child exceeded 10 µg/dl.

Question – Where have you cleaned up sites to less than 1,000 ppm?

Answer – We have cleaned up a number of sites to 400 ppm simply because we did not collect any additional data. Typically they tend to range from 400 to 1,200 ppm as cleanup levels.

Comments

No comments were made.

Concluding Statement

Scott Brown (US EPA) – It is true that the 1,000 ppm action level for East Helena can be described as a negotiated figure. Many of the community leaders at that time said that we know there are many yards above 1,000; let's get them cleaned up. Then see if that was adequate. We on the other hand are following guidance and used the lead model because we wanted to be as conservative as we could. So we said that it should be about 500 ppm. The community asked us to give 1,000 ppm a try and evaluate it over time. So we did that. But we negotiated with ASARCO that if any portion of the yard is above 1,000 the entire yard would be cleaned up to 500 ppm. The action level can be characterized today as negotiated or many things. The real overarching question is does it work? Our goal was to get [to where] 95 percent of the kids were below 10 µg/dl. We thought that was impossible, that we would never get that in East Helena. We got there within a few years and then set the goal of getting the average down to the national average. We achieved that and in the past few years we have had no child above 10 µg/dl and 98 percent are 4 µg/dl or below. It is an action level that is not accurately depicted as 1,000 ppm because it is not really twice as high as an action level of 500 ppm. When you understand the makeup of the yards in East Helena, when you have looked at a few thousand yards and what they are like and the great variability that exists here you get the understanding why the two part cleanup level does make sense for East Helena. As far as I know it is unique in the United States. When you have an

action level of 1,000 or 1,200 ppm you take the yard average and that is what you get. I am pretty sure that if the average isn't 1,200 then the yard is not cleaned up.

PROPOSED PLAN FOR FINAL CLEANUP

OF EAST HELENA'S RESIDENTIAL SOILS

AND UNDEVELOPED LANDS

TRANSCRIPT OF PUBLIC HEARING

Held at the East Helena Fire Hall
East Helena, Montana

March 1, 2007
6:40 p.m.

REPORTED BY: CHERYL ROMSA
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ORIGINAL

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WHEREUPON, the following proceedings were had:

(The public hearing was opened by Scott Brown at 6:40 p.m. Mr. Brown explained the process of arriving at the Record of Decision and gave a background of EPA's involvement in East Helena.)

(The floor was opened up for public comment at 7:05 p.m.)

MR. BROWN: Who would like -- I'll get the list, and whoever signed up first gets to talk first.

MR. BOURNS: Hi, my name is Tom Bourns. I'm actually a resident of Helena, but I'm a concerned citizen and a very good friend of one of your neighbors, Sally Nyland. I have a little bit of background in the sciences and in soil sampling and so forth, so Sally assumed that I was an instant expert and has asked me if I could help her with some of the information that is being put out here. It looks like a lot of data has been collected and a lot of analyses have been conducted on that data, and I'm trying to help her make some sense of it.

But some questions arise as I look through this. I guess the first question is -- and I just picked up on this this evening -- regarding the minimum levels that are, that it's been decided trigger the remediation. There seems to be some controversy between the State and

1 the EPA on this issue. The State is suggesting, according
2 to this newspaper article, a level of 500, and the State
3 (sic) 1,000. I'm wondering if any of the state
4 representatives are here, specifically Daryl Reed.
5 I guess if I can just make one more comment on that
6 subject. I believe that it wasn't perhaps so much a
7 discussion about the levels that are being defined as a
8 result of this study, but perhaps down the road, what
9 happens if subsequent analyses indicate that, woops, it
10 should have been 500 ppm; what do we do now, since the
11 vehicle for remediating the problem has long since left?
12 That was what I got out of this article. But I wonder if
13 you could expound on that comment a little bit, your
14 500 level versus the -- and the EPA's 1,000 level. Is
15 that a...
16 Am I correct in saying that it had more to do with the
17 time element; if we don't take care of it now, what are we
18 going to do down the line if it becomes an issue? Would
19 that be a correct paraphrasing your position on that?
20 MR. REED: Well, I'm not sure about whether I
21 should be answering in a public hearing or not.
22 MR. WARDELL: Could I make a suggestion? I'm
23 from the EPA. I would prefer that you ask the question at
24 the end of the meeting but before everyone leaves. You're
25 certainly welcome to sit down, and that will give him an

1 opportunity to sit with you one-on-one and have a
2 dialogue.
3 MR. BOURNS: I accept that. And actually, it
4 just came up, and it proceeds to my next point, and that
5 has to do with my concerns over the quality of the data
6 that were put into the system for the evaluation process.
7 I'm convinced that you guys did a lot of work to draw the
8 proper conclusions, but ASARCO, as I understand from this
9 presentation, did the primary work. They may have hired
10 the consultants, but the work and the soil sampling was
11 collected by ASARCO or their representative and not by the
12 EPA; is that correct?
13 MR. BROWN: Not entirely. We have sampled some
14 percentage of the properties ourselves, and we provide
15 oversight on practically a daily basis.
16 MR. WARDELL: Again, I'd ask that you ask those
17 questions -- Scott will be here, as well, and we're happy
18 to talk about what we've done in that regard.
19 MR. BOURNS: Okay. I would probably want to
20 pursue that. But let me get down to the nuts of my issue,
21 because there's other people here that want to submit a
22 comment.
23 I'm struck by this rather interesting summary map that
24 shows a picture of the town. And it shows two -- two
25 concentric circles. One is the likelihood of the soil

levels to be in excess of 1,000 ppm, that's the red line here (indicating), and the yellow line being the 500 threshold. And I have kind of taken the liberty to dash an intermediate line in between the centroid of this ellipse and the -- and the 1,000 level. And I see that most of the contamination is proximal to the smelter and probably asymmetric with respect to the wind direction, so it extends from the smelter in kind of a west-northwest -- or east-northeasterly direction.

But because I'm trying to work with Sally to explain some of the issues here, one of the questions that arises is that Sally's residence is virtually in the center of this bullseye (indicating), and none of her sample values -- And this will extend to some of the others of you that are here this evening, because you're interested to find out whether your yard is going to get cleaned up or not. But none of her sample levels have exceeded the 500 -- or the 1,000 ppm threshold, whereas neighbors on all sides of her obviously have had their yards replaced.

So the fallout from this smelter was rather selective, it would appear. But that's not the case. The fallout from these smelters is probably going to be ubiquitous, and it's going to be concentrated in some central area and then it's going to diffuse laterally from that.

So I call into question the validity of the actual

1 data that was collected, possibly as a result of sample
2 error or sample procedures -- maybe different samplers did
3 it different ways -- or perhaps analytical error. This is
4 a common problem that could arise. And this may be as
5 good an answer as any to the reason that Sally's lead
6 values are lower than all of her neighbors, it may have
7 something to do with the actual sample error.
8 So the question that arises from that is, what can we
9 do about this? Is there any recourse that Sally has for
10 resampling of her property or bringing in a qualified
11 expert that's acceptable by the EPA or the administrators
12 of this plan to -- to double-check these values? And for
13 that matter, do any of you others have that opportunity to
14 resample your property, just in case there is some kind of
15 sampling procedure problems involved with this? If,
16 having done that, the results show that, indeed, these
17 soils are contaminated, would the EPA then consider -- or
18 whoever the watchdog is for this then consider that
19 property eligible for cleanup?
20 That's my questions, and I think those are concerns
21 that are shared by others in this room. But I would like
22 to see if we could arrive at some answers for those
23 questions.
24 Thank you.
25 MR. BROWN: Thank you.

Sally, did you wish to make a statement.

MS. NYLAND: (Indicating negatively.)

MR. BROWN: Chris Anderson.

You know what, I need to be more careful with this. We said we were going to hear public comments first.

MR. ANDERSON: It is a public comment. I'm not a city official. I was last time. I'm a resident. I've been a resident for resident for 33 years. My name is Chris Anderson. All my kids were born in East Helena and raised in East Helena; and they're gone now, of course, moved on.

I'd like to show my support for the Record of Decision and the two-year plan. Now, I'm giving my support behind that as a resident of East Helena. And I'd also like to say that I believe that if you expand this cleanup over a period of years, that you're going to create more harm to our children through the fact that all the remediation work going on at the sites, the heavy equipment work is more dangerous to the children at this point in time than the residual lead that's still around. And the residual lead is going to be addressed in the plan through -- through your monitoring the blood levels and everything, through the Health Department's lead program.

And secondly, I think it's pretty important to move on so that we can free up the agencies that deal with

environmental pollution so that they can move on from here and move to areas within the county, within the state that also have pollution problems. And I would hate to think that they're tied up here, hanging here just simply because ASARCO happens to have deep pockets. And that's really what I believe the reason is. And further than that, go on past that, I would like to say that EPA being the parent agency, I think your children are misbehaving and they need to be spanked and they need to have their allowance taken away from them. So don't spare the ROD. That's all I have to say.

MR. BROWN: Thank you, Mr. Anderson.

Mr. Schnittgen.

MR. SCHNITTGEN: Good evening. I've been in contact with Mr. Brown some. My wife and I moved into Eastgate about three-and-a-half years ago, and we just had a baby this fall. We live downwind from most of the dirt roads that are in the East Helena area, it seems like, and in the summer, our house is in a cloud dust. And with some of the airborne lead pollution subjects here, I'm really worried about that dust posing a hazard to our daughter, and even to us, because in the summer, there's a dust cloud; there's no wind, we live in a dust cloud. And that's one of my major concerns: Is there anything as far as being able to find ways to control that dust or maybe

pave the roads or use some dust abatement techniques to keep that dust control down?

And also, there's a ditch that runs along the western edge of our property, and that, too, there's a lot of kids in our neighborhood that love to go play in there, and I'm sure there's a hazard to them. Because when the water drains off the soil -- and our ditch doesn't exactly flow fast -- I'm sure there is a lot of sedimentation. And I'm worried about that being a hot spot, as well. And also, we live on the edge of park land, and I'm not sure what kind of testing, if any, was done in that.

So those are my main concerns. Anyway, that's what I have for comments for now.

MR. BROWN: Thank you, Mr. Schnittgen.

Mr. Lindberg, are you here as a citizen of East Helena?

MR. Lindberg: I just signed up. I don't need to comment.

MR. BROWN: Is anyone else here as a citizen of East Helena?

Mr. Stipich.

MR. STIPICH: Thank you, Scott.

I am up here speaking as a citizen of East Helena. I have lived here all my life. And what I want to say is that I have feelings and care for children and want them

1 to have their health and everything, but I believe that
2 EPA, at this time, their findings and that -- and there's
3 no emissions from ASARCO anymore, which I hated to see
4 go -- that I think that it should stay at 1,000 parts per
5 million. I agree that there should be testing and
6 everything on the children in the future, but I think we
7 should put an end to the cleanup in East Helena and let
8 the people get back to their normal lives.
9 Thank you very much.
10 MR. BROWN: Thank you, Mr. Stipich.
11 I see no more residents of the East Helena area, but
12 if there is another person would who like speak at this
13 time. And may I again remind you that if you want to
14 submit written comments, by all means, do so. And those
15 of you who have already given oral comments, you're free
16 to send us written comments, as well. I encourage that.
17 If there are no more citizens, then --
18 Mike, were you going to make a statement?
19 UNIDENTIFIED SPEAKER: Not at this time.
20 MR. BROWN: Then shall we go to Mayor
21 Terrie Casey on behalf of the East Helena City Commission.
22 MAYOR CASEY: Hi. I feel like I did this just a
23 couple weeks ago.
24 I've said before that I think everyone, the City, the
25 County, the State, and the EPA, all agree that the

1 important thing here is the health of the kids. And I
2 think the blood lead levels and their improvement over
3 this period of time show that we're doing great. We're
4 better than the national average.
5 At the last meeting in January, the doctors from EPA,
6 with their presentation, basically said that there could
7 be no expected improvement in the blood lead levels; even
8 if we do make the change that DEQ is requesting, that
9 there will be no improvement. So the point would be, if
10 you can't make it any better by lowering that standard,
11 that number, making it more stringent, what's the point?
12 I think at this time, we have the county lead education
13 office; they do a great job. I give them a lot of credit
14 for the improvement in our blood lead levels. And I think
15 with them in place, I just don't see any need for this to
16 continue on.
17 We need to get on with things. Once we come out from
18 underneath that Superfund status, and with the closure of
19 ASARCO, this area is going eligible for Brownfields
20 grants. And that's not a primary focus, but it is
21 something to look forward to. There could be some more
22 improvement in this area. And if we can't improve the
23 health of the kids and the community health-wise, we may
24 as well try and move on and get on to a new future. This
25 one is gone, it's time to move on.

1 Thanks for your time.

2 MR. BROWN: Thank you, Mayor Casey.

3 Is there anyone else representing the City of East

4 Helena who would like to speak?

5 (No response.)

6 MR. BROWN: Let's move on to the County, then.

7 Melanie Reynolds.

8 MS. REYNOLDS: Hi, my name is Melanie Reynolds,

9 and I'm the county health officer. I'm here representing

10 the Lewis and Clark City-County Health Department and the

11 Lewis and Clark City-County Board of Health. I'd like to

12 take this opportunity to make some comments on the

13 Proposed Plan for Final Cleanup of East Helena's

14 Residential Soils and Undeveloped Lands.

15 The mission of the Lewis and Clark City-County Health

16 Department is to promote and protect the health of all

17 county residents. The City-County Health Department

18 administers, as has been mentioned earlier, the

19 East Helena Lead Education and Abatement Program and has

20 worked with the East Helena community, EPA, and DEQ since

21 1996. During this time, we have provided education to

22 East Helena residents about living around lead. During

23 this time, we have provided education to East Helena

24 residents, and we have -- and overall, the purpose of the

25 East Helena Lead Education and Abatement Program is to

1 prevent and reduce elevated blood levels in children, and
2 we assist in these efforts in several ways. One is we
3 coordinate blood lead screenings; we provide education to
4 at-risk groups; and we conduct voluntary environmental
5 assessments in folks' homes, as we've discussed earlier.
6 We're really pleased with the working relationship
7 that we have with the community and both agencies. We
8 also acknowledge that the work we do will be changing
9 considerably in East Helena moving into the development of
10 a Record of Decision or ROD. The primary change for the
11 Health Department and the Board of Health is that we
12 become responsible for implementation and management of
13 institutional controls. We would be doing that with other
14 folks, as well, after major cleanup activities have been
15 completed.
16 As most of you are probably aware, institutional
17 controls are the mechanisms or programs which ensure that
18 the past efforts to abate lead are continued and that all
19 citizens, current and future, are protected from the lead
20 and other contaminants that remain in the East Helena
21 environment. It would be irresponsible to have invested
22 so much time and money, as has been described today, in a
23 cleanup only to walk away and leave it.
24 EPA requires that after a cleanup is completed, a
25 local government agency must step in and protect the

1 results or remedy. That is where we come in. Since
2 institutional controls are an integral part of the Record
3 of Decision, and since the Proposed Plan is the starting
4 point for the ROD, we feel our responsibility includes a
5 thorough review of the plan from a public health
6 perspective. Board of Health members and staff have been
7 reading the plan, discussing it at Board of Health
8 meetings and informational sessions. And a special thank
9 you to EPA, DEQ, and the East Helena City Council with
10 Mayor Casey coming and doing a very informative
11 presentation to the Board of Health.
12 Among the Board of Health's focal points are verifying
13 the process and epidemiological systems that have been
14 used for selecting alternatives in the plan, understanding
15 the modeling and the data used to support different
16 interpretations, and considering the ongoing process for
17 developing and implementing effective long-term
18 institutional controls. Since the health of the public in
19 Lewis and Clark County is our specific purview, we feel an
20 obligation to understand which data was used and why and
21 carefully consider the implications of the proposed plan.
22 In summary, as the Board of Health and Health
23 Department analyze the information available to us about
24 the modeling and the data used in it, and the structure
25 and function of the institutional controls, we can

1 determine which, if any, of the proposed alternatives
2 might best serve the interest of public health in
3 East Helena.
4 Thanks again for the opportunity to provide the
5 comments. And I did make some extras copies, if anybody
6 is interested. Thank you.
7 MR. BROWN: Thank you, Ms. Reynolds.
8 Did Mr. Martinka wish to make a statement?
9 (No response.)
10 MR. BROWN: Those are all of the people who have
11 an asterisk by their name. If anyone wishes to stand up
12 and speak, you're certainly welcome to do so.
13 If not, I want to thank you again for coming.
14 John, is there anything that you would like to add?
15 MR. WARDELL: Again, echoing Scott's comments,
16 thank you for coming. I know there are some folks that
17 wanted to talk about the State and the EPA, and we're
18 happy to stay as long as necessary to sit down and talk
19 with you one-on-one. So we welcome that opportunity, and
20 thank you very much.
21 (The proceedings were concluded at 7:30 p.m.)
22 * * * * * * * * *
23
24
25

COURT REPORTER'S CERTIFICATE

STATE OF MONTANA)
ss.
COUNTY OF LEWIS AND CLARK)

I, CHERYL ROMSA, Court Reporter, Notary Public in and for the County of Lewis and Clark, State of Montana, do hereby certify:

That the foregoing proceedings were reported by me in shorthand and later transcribed into typewriting; and that the -16- pages contain a true record of the proceedings to the best of my ability.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal this 12th day of March 2007.

CHERYL A. ROMSA
Court Reporter - Notary Public
My Commission Expires 8/4/2007

SUMMARY OF PUBLIC COMMENTS AND EPA RESPONSES REGARDING THE PROPOSED PLAN FOR FINAL CLEANUP OF EAST HELENA'S RESIDENTIAL SOILS AND UNDEVELOPED LANDS

East Helena Superfund Site (Operable Unit No. 2), Lewis and Clark County, MT

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References
Attachment: Lewis & Clark City-County Board of Health Draft Regulations
Appendix: Public Comments

To go directly to a topic, place your cursor over the heading of your choice, then press "control" and "click" your mouse simultaneously.

Commenters on the Proposed Plan included the mayor and City Council of East Helena, East Helena School Board and the Superintendent of Schools, Lewis & Clark City-County Board of Health, Montana Department of Environmental Quality, Montana Department of Public Health and Human Services, Asarco, and citizens. The original submitted comments are included as an appendix to this section of the Responsiveness Summary.

Numerous comments were similar, and that comments were focused on a limited number of topics. In addition, it was recognized that the comments required comprehensive responses. Rather than respond to each comment individually (which would have resulted in repetitive responses), or respond by referring back to the first comment /response on a particular topic (which would have resulted in undue emphasis on that first comment or response), comments were grouped into the subjects shown in the Table of Contents. Many of these subjects are interrelated and readers are urged to review the Responsiveness Summary in its entirety. In addition, in a very limited number of cases a comment which seemed best suited to more than one category was included in other appropriate categories.

For ease of reading, the comments received are presented in normal text and EPA's responses are in italics.

I. CHILDREN'S BLOOD LEAD TEST RESULTS

COMMENTS

- **Ron Whitmoyer, Superintendent of Schools - Blood Lead Data Support Moving Forward - East Helena Public Schools,**

  The concerns that I have regarding this ROD are more about making an educated decision than any other point. The City of East Helena deserves to have this process move forward. The data supports the recommendation of the EPA scientists, not the feeling of the opponents of the ROD. Since individuals felt that there was not enough data I decided to look into the matter myself and requested and received the 2006 lead data comparisons with the lead concentrations in the soil of their residence and graphed them. That data is attached. … Since not a single child in East Helena has had a blood level over 10 in the last 7 years, I would be hesitant to conclude that the IEUBK model accurately picks a protective level for our town. Further the average blood lead level of all sampled children in 2006 was 1.3 ug/dl when the national average was 1.7 ug/dl.

  The IEUBK is an extremely close match to the 1993 Hydrometrics Inc. data when graphed with a third data point, the airborne lead particulates. When the air becomes a pathway for ingestion of lead you can clearly see that between 1.5 and 2.5 micrograms of lead dust in a cubic meter of air nearly matches the IEUBK model. My concern is that East Helena has

tested hundreds of children and has data to prove that the IEUBK model is not an accurate depiction of the real information we have about East Helena lead pathways. Please consider these details in making a decision regarding approving the ROD. This decision has many far reaching effects on the community that include the economic viability of the town as well as the health of its residents.

Certainly the protection of the residents and the children are paramount, but let's not build a vehicle that has child seat restraints, helmets, pillows and already deployed air bags when making a Record of Decision.

- **Ed Stipich, East Helena Councilman and Lewis and Clark County Board of Health Representative – "Bring Closure to the Cleanup"**

  Since its inception I have been involved in the East Helena Superfund Cleanup. Back then I was mayor of East Helena and I have always had the health and well-being of our citizens at heart. I have not always agreed with the EPA's politics and methods during the clean-up, but after all these years I do agree that it is time to bring the clean-up to an end. As experts have repeatedly stated, it has been a success. Blood lead level studies show that children in the East Helena area have lower blood lead levels than the national average. ASARCO is closed now, and there are no longer any concerns about the toxic emission. Yards have been replaced. Is the country willing to replace yards again, when expert doctors from the EPA have asserted this action would not improve blood lead levels in our children and at what costs?

  I say enough is enough. The City of East Helena has been in financial and economic limbo without the ability to expand business, and enlarge our tax base. It is time to bring closure to the cleanup, so we can move forward, allow economic development and ease the burden on our citizens.

- **Terrie Casey, Mayor of East Helena, Montana on behalf of the East Helena City Commission - Blood Lead Levels Better than National Average; No Need to Continue**

  I've said before that I think everyone, the City, the County, the State and the EPA; all agree that the important thing here is the health of the kids. And I think the blood lead levels and their improvement over this period of time show that we're doing great. We're better than the national average.

  At the last meeting in January, the doctors from EPA, with their presentation, basically said that there could not be expected improvement in the blood lead levels; even if we do make the change that DEQ is requesting, that there will be no improvement. So the point would be, if you can't make it any better by lowering that standard, that number, making it more stringent, what's the point? I think at this time, we have the county lead education office; they do a great job. I give them a lot of credit for the improvement in our blood lead levels. And I think with them in place, I just don't see any need for this to continue on.

- **Lewis & Clark City-County Board of Health - "Blood lead studies are not true epidemiological studies"**

  Furthermore, although the lead studies appear to be representative both spatially and based on lead concentrations the blood-lead studies are not true epidemiological studies that

incorporate several additional factors, such as socioeconomics and education level of the parents.

- **Montana Department of Environmental Quality – "Blood lead data does [sic] not document protectiveness"**

  The proposed plan asserts that Alternatives 2R and 3R are "by all known measures" equivalent in terms of overall protection. EPA bases this assertion on the recent blood lead monitoring. However, the blood lead monitoring does not document this protectiveness. Nor is EPA's basis supported by the EPA Superfund Lead-Contaminated Residential Sites Handbook (Lead Sites Handbook August 2003) that states "blood lead studies … should not be used for establishing long-term remedial … cleanup at lead sites." In addition, the past blood lead monitoring can not be used as a measure of future protectiveness. The recent (past 10 years) participation in the blood lead monitoring program is not representative with participation of only 25-50% of self-selected individuals. More importantly, the blood lead monitoring results may have also been influenced by awareness and the education efforts and thus blood levels are likely lower than if the current education effort was not effective.

- **Lewis & Clark City-County Board of Health – "The BOH does not agree that the data from the blood lead studies should be used in establishing the lead cleanup level"**

  Although not clearly described in the Proposed Plan, the BOH understands (through correspondence and discussions with EPA) the lead cleanup level was determined based on the blood lead data from East Helena and a quantitative uncertainty analysis using EPA's Integrated Exposure Uptake (IEUBK) Model.

  First, the BOH does not agree that the data from the blood lead studies should be used in establishing the lead cleanup level. EPA guidance indicates, "The Office of Solid Waste and Emergency Response (OSWER) recommends that blood-lead studies not be used to determine future long-term risk where exposure conditions are expected to change over time; rather, they be considered a snapshot of ongoing exposure under a specific set of circumstances (including community awareness and education) at a specific time" USEPA, 2006a). It is the opinion of the BOH that several factors are likely contributing to the measured blood lead levels in East Helena and do not represent the future, potential health risks to soil and dust exposures. Factors that may be affecting the blood lead studies include, but are not limited to, community awareness education, evaluation of a non-random, convenience sample (i.e., voluntary participation), the cleanup of several residential yards in East Helena since 1991, the cessation of smelter emissions, and the discontinuation of leaded gasoline.

- **Moriah Bucy – "Blood lead studies should not be used for cleanup levels"**

  The statement in the proposed plan that "the model derived predictions are but one aspect, of several equal or more important aspects, that were considered…"is interesting. It appears that the "more important" aspects that were considered are the blood lead studies conducted on children in the East Helena area. The EPA Superfund Lead-Contaminated Sites Handbook (August 2003) states that blood lead studies should not be used for cleanup levels. However, it appears that EPA is giving these studies (which are conducted on a completely voluntary basis by people who choose to bring their children in to be tested, and are therefore not representative of the population of the area) more importance than the lead model, which is

used across the nation to calculate risk-based cleanup levels.

EPA RESPONSE TO COMMENTS PERTAINING TO THE USE OF BLOOD LEAD DATA

EPA agrees that the blood lead level data support the conclusions of its scientists and agrees that the cleanup to date, and other programs and efforts to reduce lead in the environment, have been a clear success. EPA also agrees with the desire to conclude the cleanup based on the residential cleanup levels identified in the Preferred Alternative. The following category, Category II, National Guidance For Lead Sites And East Helena's Role In Its Development, addresses guidance-related comments.

East Helena children's blood lead levels have declined over time as shown in Table I -1 and Figure 7- 1 in the Decision Summary. The data show a substantial decline in blood lead levels from 1975 through the early 1990s, and continued declines to the present. Table I – 1 and Figure 7- 1 show statistics for child blood lead level tests between 1975 and 2008. The trend stands out, but more importantly the data demonstrate that by 1994-1995 national goals had already been achieved, and of more than 700 children tested after air quality standards were met (1999- 2000), approximately 97% tested at or below 4 ug/dl. Although eligible yards where children lived had been cleaned up by this time, many more yards with lead levels above the cleanup levels remained. Therefore, the cleanup continued due to the expectation that at some time it was likely that children would reside at these remaining properties.

The remedial action goals for East Helena include the following statement: No child should exhibit a blood lead level greater than 10 ug/dl and at least 95% of children should remain at or below 4 ug/dl. The goal that at least 95% of children should remain at or below 4 ug/dl was first achieved in 2001, it continues to be met or exceeded, and it surpasses the national goal for blood lead levels based on applications and predictions of the mathematical model. Should this more stringent, site-specific goal for East Helena fail to be met in the future, for any reason, there are procedures in place or proposed in the Record of Decision (ROD) to reexamine all relevant aspects of the remedy, including the soil cleanup action level.

East Helena children's blood-lead levels are significantly lower in recent years as compared to levels observed prior to the 1990s. Since 2001, 95% of children tested were at 4 ug/dl or below and only two children, of 704 children tested, had a blood lead value above 10 ug/dl. Both of these children had blood lead levels of 12 ug/dl. Through an environmental assessment the blood lead level of one of these children was attributable to lead-based paint. The cause of the blood lead level of the other child could not be determined because the parent did not allow an environmental assessment. The average of blood lead levels in East Helena and the surrounding community have been 2 ug/dl or less for the last five years, and have been approximately at or less than the national average since 2005.

Table I-1. Blood Lead Levels of East Helena Children 0 to 84 Months of Age (1975-2008)

Year	No. of children tested	No. with blood lead levels of 10 µg/dl or greater	Average blood lead level (µg/dl)
1975	90	All 90	28
1983	170[a]	77	11.5
1991-92	239	16	4.7
1993-94	34	2	5.5
1995-96	159	2	4.6
1997-98	187	7	4.1
1999-00	194	5	4.1
2001-02	129	0	2.6
2003-04	266	0	2.0
2005	9	0	1.7
2006	109	0	1.3
2007	7	0	1.6
2008	184	2	1.8

[a] Ninety-eight children residing within 1 mile of the smelter.

Asarco shut down the smelter and operations in 2001. The time period of the shutdown of the smelter corresponds to the time period when the maximum blood lead values measured in the East Helena area dropped from 14 – 16 ug/dl to less than 10 ug/dl (see Figure 7-1 in the Decision Summary), the number of children with blood lead levels greater than 10 ug/dl dropped to zero for the first time (see Table I-1), and the percentage of children with blood lead levels > 4 ug/dl decreased (see Table I-2). Both the original source for the fine particulate pathway and the opportunity for smelter workers to inadvertently bring dust home ceased at this time.

Multiple factors affect children's blood lead levels. The 1995 risk assessment noted that blood lead levels might have been influenced by factors such as the levels of lead in air and in paint, in addition to the levels of lead in soil. As previously discussed, the fine particulate pathway has had a significant effect at East Helena. In addition, it is not debated that, prior to the 1990s, street and alley dust, yard soils, and household dust – all arising from continuous smelter emissions and reentrainment of dust within the community -- were among the primary contributors to the elevated blood lead levels observed in East Helena children.

TABLE I-2. Fraction of Children Above 4 UG/DL by Year		
Year	No. of Children	PbB > 4 ug/dl
1991	224	37%
1992	15	87%
1993	10	80%
1994	24	46%
1995	75	51%
1996	84	33%
1997	71	37%
1998	116	25%
1999	51	65%
2000	143	27%
2001	93	14%
2002	36	0%
2003	159	3%
2004	107	7%
2005	9	0%
2006	109	2%
2007	7	0%
2008	184	4%

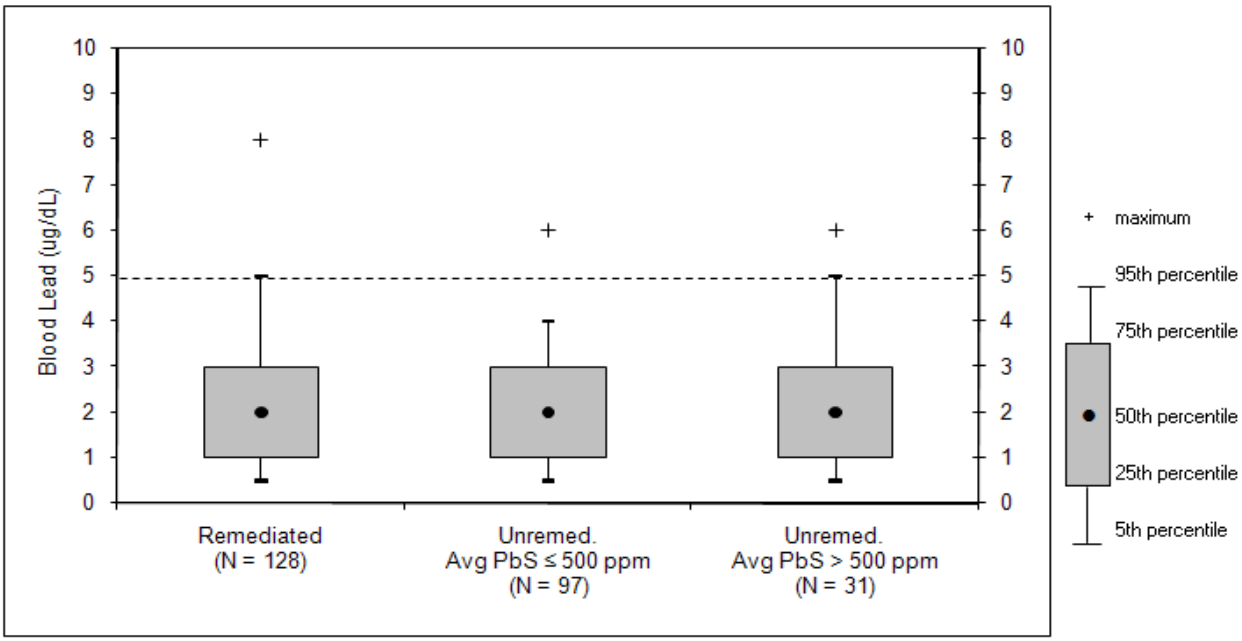
Figure 7-4 of the Decision Summary of the ROD shows the relationship between soil, air, and blood lead levels based on 1983 and 1991 data. The figure shows the importance of air lead particulate as the principal contributor to blood lead at least for locations where soil lead concentrations did not exceed the national average by more than about 1,000 to 1,500 ppm. Above these soil lead concentrations, which were common at that time, soil lead also contributed to children's blood lead levels to a significant extent, as seen in Table I-3.

Table I-3. Contribution to Blood Lead from Soil Lead or Air Lead					
	ΔPbA	ΔPbS	PbB Increase Over Baseline (ug/dL)		
Year	ug/m3	ppm	From Soil	From Air	% From Air
1983	2.61	250	0.66	3.60	84%
		500	1.33	3.60	73%
		750	1.99	3.60	64%
		1000	2.66	3.60	58%
		1500	3.98	3.60	47%
1991	1.83	250	0.66	2.52	79%
		500	1.33	2.52	66%
		750	1.99	2.52	56%
		1000	2.66	2.52	49%
		1500	3.98	2.52	39%

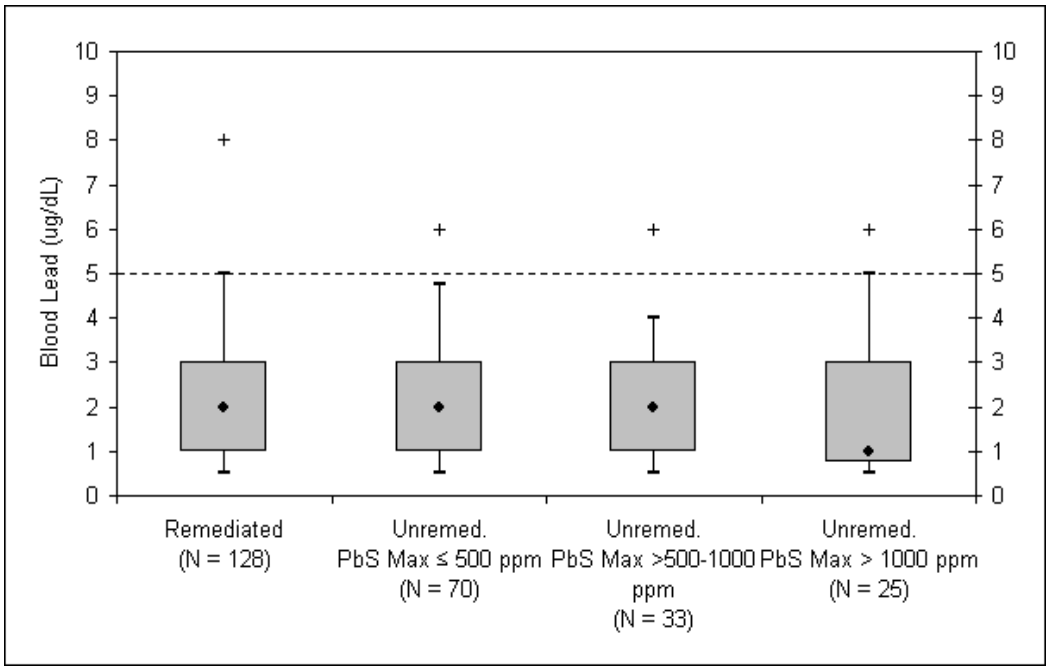
Figure I-1 depicts the relationship between blood lead levels in children and the remediation status of the residential properties where children were living. As seen, there is no measurable difference between children who live at properties that have been remediated with clean fill, and at properties where remediation has not occurred and average soil lead levels are either < 500 ppm, or are between 500 and 1,000 ppm. In addition, if maximum soil lead values are considered, there is no real difference between children who live at properties that have been remediated with clean fill and at properties where remediation had not occurred, even for a group of matched pairs with concentrations of soil lead above 1,000 ppm. This indicates that, at this site, the contribution of soil lead < 1,000 ppm to blood lead is sufficiently small that the effect cannot be detected. These data also indicate that the level at which soil lead starts to have a distinguishable effect on blood lead level is greater than 1,000 ppm.

Figure I - 1. Relation Between Average Soil Lead and Blood Lead Values for Children (0 to 84 Months) at Unremediated Properties in East Helena, 2001- 2007 2001 to 2007 in Relation to Remediation Status and Soil Lead Concentrations

PANEL A: BASED ON YARD-WIDE AVERAGE SOIL LEAD



PANEL B: BASED ON MAXIMUM SOIL LEAD IN YARD



Reliability and Appropriateness of Blood Lead Data

Based on an evaluation of the data, the data may be used to draw conclusions regarding the site, even though the data were not collected in the same way that data would be collected for a traditional epidemiological study.

The following summary of the analysis of the blood lead sampling program was given in a letter from EPA to Lewis and Clark City-County Department of Health dated March 13, 2007. EPA's Region 8 toxicologists and risk assessors prepared the analysis. The letter and attachment state, "The East Helena Lead Education and Abatement Program, administered by the City-County Health Department, has been performing a blood lead survey in East Helena for a number of years. The data from this survey show that blood lead values have decreased substantially over time, and that the incidence of PbB above 10 ug/dL is now very close to zero. These data support the conclusion that cleanup activities at the site, coupled with the effects of national programs to reduce lead in the environment, have been successful in reducing lead exposures from all sources in East Helena to acceptable levels. However, in order for this conclusion to be valid, it is important to examine the quality of the blood lead data set. Based on a consideration of participation rate, statistical uncertainty, spatial representativeness, and soil lead representativeness, it is concluded that the blood lead data generated by the County program are reliable and are appropriate for use by risk managers and other health professionals in assessing site conditions."

The detailed analysis is contained in the referenced letter and attachment that can be provided upon request. The percentage of East Helena children that participated in blood lead screenings ranges from 15 to 52 percent by neighborhood for the period from 1991 to 2006 (see Table I-4). The total number of unique participants who have participated from each neighborhood has been determined from the blood lead database maintained by Lewis and Clark City-County.

Table I-4. Children Blood-Level Sampling Participation Rate

Neighborhood*	Number of children age 0-6 based on 2000 survey	Total number of children age 0-6 who have participated between 1991-2006	Participation Rate
Grandview	53	56	34%
East Gate 2	198	160	26%
Sunny Lane + East Gate 1	187	148	25%
La Casa Grande	43	70	52%
Canyon Ferry	68	60	28%
Manlove	19	9	15%
E. Helena + West E. Helena	188	240	41%

* See Figure 1-2 in the Decision Summary of the main body of the ROD

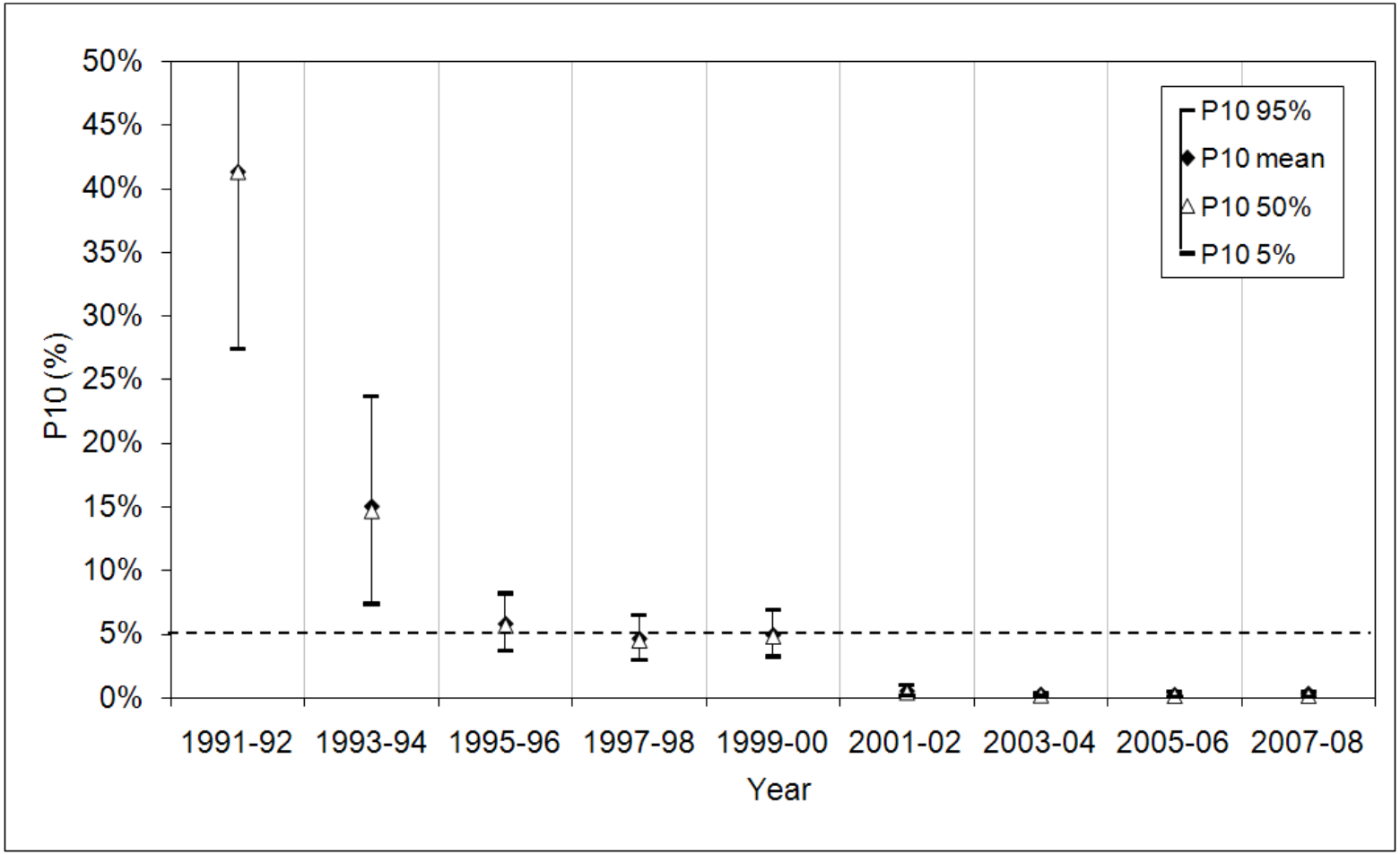
When a blood survey is part of an on-going program, as is the case at East Helena, both the total number of children who have participated and the size of the eligible population (the total number of children who were age 0 to 6 at any time during the study) will increase each year, so the participation rate (PR) is a function of time. As seen in Table I-3, the

participation rate varies between neighborhoods, but is generally about 25 to 50 %. Assuming that the blood lead program will continue to operate for some time into the future, and that the number of new children recruited each year will remain similar to current values, these rates will tend to increase over time.

There are two key factors to consider when deciding if the participation rate is enough to provide a reliable data set for drawing conclusions about blood lead levels in area children: statistical uncertainty and representativeness. The analysis showed that the data are highly representative, both temporally and spatially. Blood level data have been collected at the site since 1975 and through the Lewis and Clark County Lead and Education Abatement Program since 1995. The data span a wide range of time and they cover all of East Helena's neighborhoods. Sheets 2 and 3 of this ROD show the residential locations at which children tested for blood lead levels resided, and reflect the spatial representativeness. Another factor in the assessment of the data is the level of uncertainty. Figure I - 2 shows the uncertainty associated with the blood level data at East Helena. As seen, the uncertainty in the data set is low indicating that the data are sufficient to evaluate compliance with heath-based objectives with acceptable confidence.

It is unlikely that the low blood lead levels observed in East Helena are due in significant measure to public education and awareness. Although the current program of lead education is valuable in providing citizens with knowledge they may utilize to reduce risk from lead exposure, EPA does not believe that this program could be responsible for generating a bias in the data set that could account for the current observations. Previous study results suggest that awareness of lead hazards may result in temporary changes in behavior which reduce exposure to lead hazards and blood lead levels, but the changes are not long term. For example, in the Urban Soil Lead Abatement Demonstration Project, (USEPA, 1996), blood lead levels had rebounded by the second year of the study. The blood lead studies in East Helena have been conducted for more than 15 years. The results are consistently low, and the trend is downwards. It is unlikely that the data are influenced to any large extent by public awareness, and therefore the changes observed in the blood lead data are considered to be permanent, and not a result of temporary behavioral changes. Moreover, the blood lead data indicate that current exposure levels are sufficiently far from 10 ug/dl that even if there were some small bias in the data (which is thought to be unlikely), the judgment that the blood lead data indicate the current soil cleanup program is effective remains valid.

Figure I - 2. Uncertainty in P10 Values for Children (0 to ≤ 84 Months) in East Helena



II. NATIONAL GUIDANCE FOR LEAD SITES AND EAST HELENA'S ROLE IN ITS DEVELOPMENT

COMMENTS

- **Laura and Brian Vachowski – "If the lead cleanup levels were based on blood lead study data as the plan suggests, such a basis is contradicted by EPA's own guidance"**

  We additionally note that if the lead cleanup levels were based on blood lead study data as the plan suggests, such a basis is contradicted by EPA's own guidance. See EPA Superfund Contaminated Residential Sites Handbook (August 2003) at pg. B-4 ("OSWER recommends that blood lead studies not be used for establishing long-term remedial … cleanup levels at lead sites.")

- **Lewis and Clark City-County Board of Health – "BOH does not agree that the data from the blood lead studies should be used in establishing the lead cleanup level"**

  . . . First, the BOH does not agree that the data from the blood lead studies should be used in establishing the lead cleanup level. EPA guidance indicates, "The Office of Solid Waste and Emergency Response (OSWER) recommends that blood-lead studies not be used to determine future long-term risk where exposure conditions are expected to change over time; rather, they be considered a snapshot of ongoing exposure under a specific set of circumstances (including community awareness and education) at a specific time" USEPA, 2006a).

- **Montana Department of Environmental Quality - Adopt Risk Based Cleanup Levels that Conform to Guidance**

  Adopt risk-based cleanup levels for lead (and arsenic) for current and reasonably anticipated residential soils that conform to EPA regulations and guidance.

  <u>EPA RESPONSE TO COMMENTS PERTAINING TO NATIONAL GUIDANCE</u>

  The first few child lead studies involving East Helena's children preceded both the development of directives (i.e., guidance) for lead sites and the development and application of a mathematical model for predicting blood lead levels from environmental and biological data. In fact, East Helena's early childhood lead studies were often referred to as "the model for the model," during the developmental stages of the lead model.

  Some of the earliest directives issued by EPA regarding lead sites (circa late 1980s and early 1990s) were developed in consultation with toxicologists and other medical professionals and scientists who participated in the design, conduct and interpretation of childhood lead studies performed at East Helena.

  Quoting from one of the earliest of directives (OSWER Directive #9355.4-02, September 1989):

"The purpose of this directive is to set forth an interim soil cleanup level for total lead, at 500 to 1,000 ppm, which the Office of Emergency and Remedial Response and the Office of Waste Programs Enforcement consider protective for direct contact at residential settings.

"This [directive] adopts the recommendation contained in the 1985 Centers for Disease Control (CDC) statement on childhood lead poisoning and is to be followed when the current predicted land use is residential. The CDC recommendation states that…. "lead in soil and dust appears to be responsible for blood levels in children increasing above background levels when the concentration in the soil or dust exceeds 500 to 1,000 ppm." Site-specific conditions may warrant the use of soil cleanup levels below the 500 ppm level or somewhat above the 1,000 ppm level."

Pertinent excerpts from a July 1994 OSWER Directive (# 9355.4-12), read as follows:

> *"Recent developments. Following discussions among senior regional and OSWER management, the OSWER workgroup…. recommended ...a "two step" decision framework.... [To] identify a single level of lead in soils that could be used as…the PRG [Preliminary Remediation Goal] for CERCLA site cleanups… but would also allow site managers to establish site-specific cleanup levels (where appropriate) based on site-specific circumstances."*
>
> *"Findings from the three cities (Baltimore, Boston, and Cincinnati) of the Urban Soil Lead Abatement Demonstration Project…indicate that dust and paint are major contributors to elevated blood lead levels in children.* ***Furthermore, ….any strategy to reduce overall lead risk at a site needs to consider not only soil, but other sources and their potential exposure pathways."[Emphasis added]***
>
> *"Use of Blood Lead Data: In conducting remedial investigations for CERCLA…. [This] interim directive recommends evaluating available blood lead data. In some cases, it may be appropriate to collect new or additional blood lead samples…. Therefore, any available blood lead data should be carefully evaluated by EPA regional risk assessors to determine their usefulness."*

In respect to the last paragraph above, but as well to excerpts of other directives noted above, it was appropriate for EPA to consider the East Helena blood lead data then, and it remains appropriate to this day. The coordination that occurred among regional toxicologists, project managers, local health professionals (who conducted the studies according to carefully coordinated protocols) and OSWER was exemplary.

While it is accurate to conclude that EPA guidance through the mid- to late 1990s reflects a shift of emphasis towards greater dependence on the IEUBK lead model, it is equally accurate to see and conclude that the blood lead data for East Helena's children were recognized as vital, were consistent with recommendations made through directives issued by OSWER, and were given careful consideration by OSWER during the development of a predictive model and the evolving guidance that followed.

EPA does not interpret past or current guidance to mean that the model—and only the model—should be used to finish the cleanup at East Helena, to the exclusion of arguably the most complete collection of site-specific data available for a lead site. EPA believes that

other people involved in the early coordination efforts and the coincident decisions would support that interpretation.

OSWER Directive # 9200.4-27P, as cited in Superfund Lead-Contaminated Residential Sites Handbook (USEPA, 2003), states that ***the IEUBK model is not the only factor to be considered in establishing lead cleanup goals, and that EPA decision makers retain the discretion to adopt approaches on a case-by-case basis …. as appropriate. EPA's Risk Assessment Guidance for Superfund: Process for Conducting a Probabilistic Risk Assessment (USEPA, 2001), recommends that multiple criteria form the basis of the remedial decision when selecting a final cleanup level within the plausible range. The consideration of biomonitoring data (blood lead data) is listed as one example of such criteria.[Emphasis added]***

The first section of this Responsiveness Summary describes children's blood lead test results and the relationship to the lead fine particulate pathway, and the absence of any meaningful relationship between blood lead data and remaining soil lead data. National guidance supports use of these blood lead data in the determination of cleanup goals.

A remedial action goal for East Helena is that no child should exhibit a blood lead level greater than 10 ug/dl and at least 95% of children should remain at or below 4 ug/dl. The goal that at least 95% of children should remain at or below 4 ug/dl was first achieved in 2001, it continues to be met or exceeded, and it surpasses the national goal for blood lead levels based on applications and predictions of the mathematical model.. Should this more stringent, site-specific goal for East Helena fail to be met in the future, for any reason, there are procedures in place or proposed in the ROD to reexamine all relevant aspects of the remedy, including the soil cleanup action level.

III. PREDICTIVE MODELING (IEUBK MODEL)

COMMENTS

- **Moriah Bucy – "Default values should be input for all variables for which site-specific data is not available"**

  EPA chose to input "regional data" from the Butte and Anaconda Superfund sites in its IEUBK model to come up with a site-specific risk-based cleanup level for East Helena. Data from another Superfund site is not specific to East Helena and therefore is inappropriate to use in the model. Default values should be input for all variables for which site-specific data is not available.

- **Montana Department of Environmental Quality – "It is inappropriate to use 'regional data' if site-specific input parameters cannot be calculated"**

  EPA's Technical Review Workgroup's (TRW) recommendation for running the lead model (IEUBK model) is to use default values unless representative site-specific data appropriate to the variable in question are available. It is inappropriate to use "regional data" if site-specific input parameters cannot be calculated. Thus, the Record of Decision should not reference or use regional data in the text or in the tables. EPA Region 8 chose the parameters, many of which DEQ and the EPA Technical Review Workgroup (February 17, 2006, memo) consider

to be invalid or unrepresentative, and not equally plausible.

- **Lewis & Clark City-County Board of Health – "The BOH believes it is appropriate to use the site-specific data obtained for the soil dust absorption fraction and the fraction of soil in dust term. The remainder of the exposure parameters should not be adjusted from the default values"**

  In performing the IEUBK modeling, the BOH believes it is appropriate to use the site-specific data obtained for (1) the soil dust absorption fraction of 71% relative bioavailability (35.5% when expressed as an absolute bioavailability) (USEPA, 1999b) and (2) the fraction of soil in dust term of 0.17. The remainder of the exposure parameters should not be adjusted from the default values, as described below:

  Soil Ingestion Rates -EPA guidance indicates the default soil and dust ingestion values are based on several observation studies of soil ingestion in children and are appropriate and representative estimates of soil ingestion for U.S. children. The IEUBK Model was calibrated and validated with the default ingestion values; therefore, EPA (2006a) indicates it is unknown how the use of alternate ingestion rates would impact the model predictions. Adjustments to the ingestion rates may only be made after approval by EPA's Office of Emergency and Remedial Response (OERR).

  Before the ingestion rates measured in the Anaconda study could be used in the IEUBK Model, the ingestion study (Stanek and Calabrese, 2000) must be submitted to OERR for review by the Technical Review Workgroup for metals and asbestos (TRW). If the OERR approves of the adjustment to the ingestion rates, they will be incorporated into the guidance and shared among other EPA Regions (USEPA 1999a). Therefore, the BOH believes the default soil and dust ingestion values are most appropriate.

  Geometric Standard Deviation (GSD) - EPA guidance (USEPA, 2006a) indicates that site-specific estimates of GSD should not be substituted for the default value without detailed, scientifically defensible studies documenting site-specific differences in child behavior or lead biokinetics. Such site-specific studies are not available for East Helena. Therefore, the BOH believes the default GSD is most appropriate.

  The BOH appreciates the responses from and the discussions held with EPA Region [8] toxicologists regarding this issue. We understand from these discussions that the EPA Region VIII toxicologists have a differing opinion than the TRW regarding the use of variable inputs, specifically for soil ingestion rates and GSD (TRW, 2006). In the interest of protecting public health, we have chosen the more conservative of the EPA opinions (i.e., TRW).

  Using the appropriate input values (as described above), the IEUBK Model predicts a lead cleanup concentration of 520 ppm (using the geometric mean as the point estimate). In other words, a lead cleanup concentration of 520 ppm would limit the risk of childhood blood lead levels exceeding 10 micrograms per deciliter (ug/dl) to 5% of the population (i.e., the current OSWER cleanup goal) (EPA, 1994).

- **Lewis & Clark City-County Board of Health - "A deterministic approach using predictive blood lead modeling should be used to establish a health-protective cleanup level for lead"**

. . . Second, differing opinions regarding the quantitative uncertainty analysis exist within EPA. It is the BOH'S understanding that the EPA Region [8] toxicologists believe a quantitative uncertainty analysis can be used in conjunction with the IEUBK to develop a range of potential cleanup values, while EPA's Technical Review Workgroup for metals and asbestos (TRW) believe a deterministic assessment resulting in a single cleanup value is appropriate (TRW, 2006). The TRW is an EPA interoffice workgroup with the specific mission to review applications of lead risk assessment methodologies and is responsible for developing national guidance and documentation on the structure, application, and validation of the IEUBK Model. The BOH does not have the level of expertise to determine which EPA opinion is the most scientifically valid for East Helena. In the interest of protecting public health; we believe it is prudent to use the more conservative approach, in which the deterministic assessment is used to generate a single cleanup value.

Consequently, the BOH believes that a deterministic approach using predictive blood lead modeling should be used to establish a health-protective cleanup level for lead in East Helena. Blood lead modeling should be focused on the most-sensitive potential receptors (i.e., children and fetuses). The IEUBK Model is appropriate for childhood receptors; however, the BOH has specific recommendations for input values that are described in the following section. EPA's Adult Lead Model is appropriate for estimating fetal blood lead concentrations for pregnant women exposed to lead contaminated soil (USEPA, 1996). Fetal blood modeling should be included in the development of a health protective lead cleanup level in East Helena. Specifically, a soil contact-intensive scenario should be evaluated to assess the health protectiveness of the lead cleanup level for fetal receptors (e.g., a pregnant female construction worker exposure scenario) (USEPA, 2004b).

- **Montana Department of Environmental Quality - "There should be no conversion of the model's output to a new [Geometric Mean]"**

  The Lead Model Re-Evaluation report shows that lead from residential soils and homes still present a risk of unacceptable lead exposure with soil lead levels above 520 ppm. The Record of Decision should include the Results statement from the report, "Based on the site-specific inputs to the model… the value of 5% at a soil concentration of approximately 520 ppm. This value is identified as the site-specific RBC for lead in soil." DEQ accepted the site-specific parameters used to calculate this RBC but agreed with EPA's Technical Review Workgroup (TRW) in their recommendation "that there should be no conversion of the model's output to a new [Geometric Mean]. Use of the arithmetic mean produces a RBC of 610 ppm lead (which DEQ has previously accepted as appropriately protective).

- **Montana Department of Environmental Quality - Implement the Technical Review Workgroup's Recommendations**

  Implement the EPA Technical Review Workgroup's recommendations in their February 17, 2006 memo.

- **Lewis & Clark City-County Board of Health - Identify the members of the risk management team**

  Page 10, 2nd column, paragraph 2 (of the Proposed Plan) - Who is the risk management team? The proposed plan states, "All of the *alternative input values utilized* were specifically requested by the *risk management team* and are deemed to be scientifically valid." Please

identify the composing members of the risk management team.

- **Lewis & Clark City-County Board of Health – "The lead cleanup level should also allow for the uncertainty associated with the toxicity of lead"**

  The development of the lead cleanup level should also allow for the uncertainty associated with the toxicity of lead, a probable human carcinogen. Recent data indicates that blood lead levels below 10ug/dl may cause significant health effects. EPA (2006b) indicates "Even children with low lead exposure levels (having blood lead levels of 5 to 10 ug/dl or, possibly, somewhat lower) are at notable risk, due to the apparent non-linear dose-response relationships between blood lead levels and neurodevelopmental outcomes". Further, EPA (2006a) indicates "There is no level of lead exposure that has yet been identified, with confidence, as clearly not being associated with possible risk of deleterious health effects". Regarding fetal exposure, studies have found that women who have been exposed to lead in childhood have accumulated large stores in their bones that may mobilize from bone to blood during late pregnancy and lactation. An increased risk of spontaneous abortion, neurobehavioral deficits in offspring, and, in some studies, gestational hypertension, have been reported at pregnancy blood lead levels at concentrations.

  The BOH appreciates the information provided from EPA (2007) regarding the Centers for Disease Control explanation for the present level of concern of blood lead levels (used in the current OSWER cleanup goal). Indeed from this explanation, and recognition that many current environmental and public health policies at the federal level do not represent scientific consensus, it is possible that the level of concern may not be lowered at anytime in the foreseeable future. Then again, over the past few decades, the blood lead level of concern has decreased from 40 ug/dl to 10 ug/dl. The BOH believes it is reasonable to anticipate the level may decrease again in the future. Our belief is supported by substantial current scientific literature. EPA has noted as recently as October, 2006: "Some recent studies of Pb neurotoxicity in infants have observed effects at population average blood-Pb levels of only 1 or 2 ug/dl; and some cardiovascular, renal, and immune outcomes have been reported at blood-Pb levels below 5 ug/dl." (EPA 2006b). As such, the lead cleanup level should be developed taking into consideration this possibility.

- **Laura and Brian Vachowski - Lead effects and age**

  Recent studies demonstrate that detrimental lead effects are not limited to children under the age of 7, but in fact, can be seen in children up to the age of 18. Nothing in the proposed plan appears to recognize that fact.

<u>EPA RESPONSES TO COMMENTS PERTAINING TO PREDICTIVE MODELING</u>

At East Helena, children's blood lead levels have been measured for more than 20 years, and are continuing to be measured. Parents and educators strongly support blood lead monitoring for children in this community. These blood lead level data have been determined to be reliable and appropriate for use by risk managers (see Section I of this Responsiveness Summary). Additional site-specific data, including concentrations of lead in air and in soil, have also been collected at the site over the last 20 years, and some of these data are co-located with the blood lead data. For example, soil samples for lead have been collected from the same residences where children have had blood lead levels tested in the same year. The East Helena site-specific data are a primary basis for the soil lead cleanup levels identified in Section 8 of this ROD, and were selected in lieu of results from EPA's lead model as a basis for selection of cleanup levels.

Nonetheless, EPA ran the Integrated Exposure, Uptake and Biokinetic (IEUBK) lead model that can be used at other lead sites to predict soil lead concentrations anticipated to meet the national goal that a child should have no more than a 5% chance of having a blood level greater than10 ug/dl. The IEUBK model was run originally in 1995 in accordance with guidance at the time. In 2005, the updated IEUBK model was run using nationally and locally-derived data. East Helena data were used for the soil to dust ratio (the fraction of yard soil determined to be present in household dust in East Helena) and the relative bioavailability of lead. Using these two values, and national default values for all other model input parameters, the IEUBK model predicts that a concentration of lead in soil of 520 ppm will result in no more than a 5% chance that a child would have a blood lead level greater than 10 ug/dl.

IV. LEAD CLEANUP ACTION LEVELS

COMMENTS

- **Mr. Stipich, East Helena Resident – "It [lead cleanup level] should stay at 1,000 parts per million"**

  . . . I agree that there should be testing and everything on the children in the future, but I think we should put an end to the cleanup in East Helena and let people get back to their normal lives. . .

- **Terrie Casey, Mayor, City of East Helena - "We want to see the Record of Decision with the continuation of the remediation level at 1,000 ppm"**

  The proposed plan has one alternative 3R that recommends remediation when there is a measurement of 500-ppm lead in the soil. Since 1991 there have been 570 residential lots cleaned up using the trigger action level of 1,000 ppm. How will this new plan affect yards that have already been remediated? Will some residences be seen as "contaminated" even though their yards have been remediated under the initial regulations? It seems like a poor plan to begin remediation under one set of regulations and then to change the standards when the end of the cleanup and a Record of Decision is in sight. This has the potential to create conflict within the community and has legal ramifications as far as citizens purchasing property through a realtor and being assured, not only by the realtor, but also by the Lewis and Clark Lead Abatement office, as well as Hydrometrics that their yard has been cleaned up to the designated standards….

  We want to see the Record of Decision with the continuation of the remediation level at 1,000 ppm. The statistics that the Lead Abatement office has, will support this.

- **Tom Bourns – "What happens if subsequent analyses indicate that . . . it [lead cleanup level] should have been 500 ppm?"**

  …What happens if subsequent analyses indicate that, woops, it [1000 ppm lead concentration in soils Risk Assessment based cleanup level] should have been 500 ppm; what do we do now…?

- **Laura and Brian Vachowski – "EPA's selection of lead levels have[sic] no apparent rational basis and . . . are not protective of human health."**

The EPA's selection of lead levels have no apparent rational basis, and as applied, are not protective of human health. The EPA has failed to provide any legitimate basis for requiring a 500 ppm lead cleanup level for undeveloped lands, all the while allowing developed residences to contain levels of lead between 500 ppm and 1,000 ppm. Either 1,000 ppm is protective or 500 ppm is protective. If they both are equally protective or the difference is negligible (as is suggested on page 12 of the plan), then there is no rational basis for the undeveloped land lead cleanup level to be 500 ppm. If 1,000 ppm is not protective, then every property exceeding 500 ppm should be cleaned up by the EPA to 500 ppm.

Furthermore, under the plan, neighbor A could have 999 ppm of lead on his developed property and the EPA would require no cleanup. Neighbor B, right next door, could have 1,001 ppm lead on his developed property (or 501 ppm on his undeveloped property) and the property would be required to be cleaned up to 500 ppm. This would result in a patchwork of properties, some meeting a protective level of 500 ppm and others having lead levels almost twice as high. Indeed, under the existing plan, should we develop our undeveloped land and have to cleanup the property to 500 ppm, it would be contiguous to our house area, where the lead levels exceed 500 ppm. Such results clearly cannot be deemed protective.

- **Montana Department of Environmental Quality – "DEQ supports EPA in proposing a soil lead action level of 500 ppm"**

  DEQ supports EPA in proposing a soil lead action level of 500 ppm for the undeveloped lands proposed for development but would also support the risk-based concentration of 610 ppm throughout the operable unit. DEQ also tentatively supports EPA's proposed recreational and commercial exposure cleanup levels although DEQ needs to review the assumptions, calculations, and risk management basis used to develop these new cleanup levels.

- **Montana Department of Environmental Quality - "DEQ requests that EPA modify its alternative based on qualifying yard quadrants greater than 610 ppm lead"**

  For existing residential yards, DEQ supports continuing with all the sampling and cleanup protocols developed in the past 15 years under the removal action's administrative order on consent, with the exception of the soil lead level needed for a yard to qualify for cleanup. DEQ supports cleanup of all qualifying quadrants or sections of the yard with soil lead concentrations above the risk-based concentration (RBC) of 610 parts per million (ppm). DEQ requests that EPA modify its alternative based on qualifying yard quadrants greater than 610 ppm lead (and associated cost estimate with time frame for implementation) in the Record of Decision, and identify that alternative as a component of the selected remedy.

EPA RESPONSES TO COMMENTS PERTAINING TO LEAD CLEANUP ACTION LEVELS

Residential

EPA agrees that the cleanup level should remain at 1,000/500 ppm soil lead.

Undeveloped Lands

Undeveloped lands surrounding East Helena exhibit relatively little variability, as shown in Figure 5-7 of the Decision Summary for the Asarco Lamping property (West Fields). Soil

sampling that has been conducted on several hundreds of acres of agricultural land consistently reveals fairly uniform and predictable lead concentrations across each field. This fact, combined with EPA's preference for in place treatment of undeveloped lands that require some form of remediation to accommodate a new land use, substantially reduces uncertainty. Therefore, in order to keep the costs of preparing undeveloped lands affordable, but without compromising the need for an outcome that is adequately protective of the new land use, a readily achievable 500-ppm lead cleanup action level was adopted. The cost associated with bringing undeveloped lands easily into conformance with residential standards ($4,800 per acre) is a more effective use of funds than would be requiring an equivalent sum of money, or significantly more money, to subject undeveloped lands to the same sampling requirements as is necessary for developed residential properties.

The final outcome for undeveloped lands undergoing sampling and a change in land use will not be so different from what will be achieved for residential areas. In the end, as newly-developed residential areas blend into existing residential areas, all will exhibit neighborhood average lead values less than 500 ppm. Already, this has been demonstrated in East Helena: Compare, for example, the former Diehl Fields (treated to less than 500 ppm lead and recently developed with a school and homes) and the adjacent neighborhoods that have undergone cleanup of qualified properties according to current protocols. Despite the unavoidable variability within individual yards and from yard to yard, existing residential neighborhoods as a whole will average out to approximately the same as new neighborhoods that are yet to be developed.

More important is the fact that once remedial action construction is completed, lead levels of all properties—developed or undeveloped, cleaned up or not qualified—will be well below EPA's threshold of concern for lead in soils at this site. This conclusion is strongly supported by multiple lines of evidence. EPA's remedial action goals and objectives (Section 8 of the Decision Summary) were developed to assure that soil lead and arsenic levels that remain after the cleanup is completed will be more than adequately protective for residents and visitors alike, particularly children.

V. INSTITUTIONAL CONTROLS (REMEDY PROTECTION MEASURES)

COMMENTS

- **Laura and Brian Vachowski - "Proposed plan fails to properly identify anticipated institutional controls"**

  The proposed plan fails to properly identify anticipated institutional controls and appears to attempt to place at least partial responsibility for developing those controls in the hands of local government. As EPA's own guidance makes clear, developing appropriate institutional controls is the EPA's responsibility, not local government's. *See Institutional Controls: A* Site Manager's Guide to Identifying, Evaluating, and Selecting Institutional Controls at and RCRA Corrective Action Cleanups" (EPA 540-F-00-005, 09/2000).

- **Lewis & Clark City-County Board of Health - "The BOH . . .will only accept the responsibility of Institutional Controls as long as there is funding in place."**

  Page 19 (of the Proposed Plan) - The BOH requests that the EPA state the local government will only accept the responsibility of Institutional Controls as long as there is funding in place.

- **Lewis & Clark City-County Board of Health - "The BOH has several concerns with the implementability of the institutional controls"**

  The BOH has several concerns with the implementability of the institutional controls that must be addressed prior to the selection of the Final Cleanup Alternative. These concerns are listed below:

  Effectiveness in Preventing Exposures - The institutional controls, common to all the cleanup alternatives (except "No Action"), play a significant role in the protection of human health in East Helena and the surrounding area. Considering the health protectiveness of the cleanup alternatives rely heavily on the effectiveness of the institutional controls, the BOH would like information regarding their anticipated effectiveness prior to the selection of the Final Cleanup Alternative. Such information should be gathered from other hazardous waste sites where the selected remedy relied heavily on institutional controls. In addition, an approach should be defined to monitor or measure the effectiveness of the institutional controls in East Helena over time. For example, will future blood lead data be the only measure of effectiveness, or will additional data, such as in-home environmental assessments, community interviews, or enforcements, also measure/monitor effectiveness?

  Content - To effectively develop and implement institutional controls, the BOH requires more information regarding their content. EPA should provide a list of recommendations and ideas that have been used successfully at other hazardous waste sites, as well as operational/management ideas. In addition the BOH requests examples of the specific legal language used to establish "successful" institutional controls at other sites.

  Enforceability - The BOH has concerns with enforceability of the institutional controls. Prevention of certain potential exposures does not appear to be enforceable, such as

exposures within residences (e.g., attic dust) and the long-term Best Management Practices (BMP) for agricultural areas. Prior to the selection of the Final Cleanup Alternative, EPA must provide examples of specific mechanisms to be included in the Institutional Controls for such exposures.

Funding - The City-County Health Department does not have the financial resources to develop, implement, manage, and enforce the institutional controls. As such, the BOH will accept responsibility for the institutional controls only if sufficient funding will be available.

The BOH requests that the EPA provide detailed information and justification regarding the development of the cost estimates for the institutional controls, as well as the proposed funding mechanisms. Specifically, the BOH would like to ensure the following types of services are included in the cost estimates:

- Soil sampling and analysis
- Blood lead monitoring
- In-home environmental assessments and contaminant abatement
- Management of agricultural areas - the City-County Health Department does not have expertise in agricultural BMPs, nor does Lewis Clark County have a department specializing in agricultural practices.
- Air quality monitoring to evaluate the effectiveness of the agricultural BMPs
- Expansion of the community education programs to include families not residing in East Helena, but whose children attend school or in East Helena.
- Free permits - EPA emphasized free permits, presumably to ensure that homeowners and landowners are not unduly burdened by the institutional controls. The permits may have a significant cost to the City-County Health Department through permit preparation, review and administration, soil testing, and in-home environmental assessments.
- Contingencies - the cost estimates should allow for the possibility that the cost estimates will not be sufficient to adequately manage the Institutional Controls.

- **Montana Department of Environmental Quality – "The Proposed Plan did not include adequate discussion of anticipated institutional controls"**

The Proposed Plan did not include adequate discussion of anticipated institutional controls (ICs). The Proposed Plan identified Lewis and Clark County as responsible for determining necessary institutional controls. EPA has published a guidance document entitled "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating, and Selecting Institutional controls at Superfund and RCRA Corrective Action Cleanups" (EPA 540-F-00-005, 09/2000). This guidance clearly defines the steps that EPA, not a county or other entity, uses to identify and evaluate the appropriate [ICs] for a site. DEQ supports the involvement of local and state governments as well as other affected parties in the ICs decision making process; however, the responsibility of identifying and evaluating potential institutional controls is EPA's, in consultation with the state, and should not be a burden unilaterally placed on the County. ICs should be considered and included in the selected remedy for the Record of Decision. ICs are a critical part of the remedy and the success of the implemented remedy where active response measures are impracticable. Please provide details of anticipated institutional controls, including information regarding costs, enforcement, implementation, funding, etc., in the Record of Decision.

Identify and evaluate potential institutional controls, as that is the responsibility of EPA, in

consultation with the state. The remedy required institutional controls for soil disturbance, proposed development, and the soils repository. The Record of Decision should include funding mechanisms, development, implementation, and enforcement of institutional controls.

- **Lewis & Clark City-County Board of Health - "Describe the "other sources" of funding"**

  Page 17, 2nd column, first complete paragraph, under the 1R alternative (of the Proposed Plan) - Please describe the "other sources" of funding that may be available? Who would be responsible for securing those sources of funding?

- **Montana Department of Environmental Quality – "Include a discussion on the long-term management and institutional controls for the East Fields soil repository"**

  The Record of Decision should include a discussion on the long-term management and institutional controls for the East Fields soil repository. This may include a cap, dust control, weed control, inspections, deed restrictions, groundwater monitoring.

- **Lewis & Clark City-County Board of Health - Provide more details regarding the East Fields soil repository**

  Page 21, 2nd Column, Paragraph 2 (of the Proposed Plan) - Who will have the ultimate long-term responsibility for the management, operation, and monitoring of the soil repository at the East Fields? Who covers the cost of this? Will other soil repository areas be needed for the cleanup? Please provide more details regarding this topic and the area.

- **Montana Department of Public Health and Human Services - Establish ICs that prevent disturbance of contaminated soil and prevent human exposure to interior dust**

  Establish institutional controls that prevent disturbances of contaminated soil that would remain in East Helena, and prevent human exposure to interior household dust during renovation or demolition of existing housing stock in East Helena. Achieving these two parts of the EPA proposed plan must have the highest possible priority. To the extent funds are available to implement and evaluate implementation of the proposed plan; these funds need to be preferentially targeted to these two components of the plan.

- **Lewis & Clark City-County Board of Health - Describe EPA's 5-Year Review**

  Page 2, 2nd column, paragraph *2* (of the Proposed Plan) - Please provide a description of EPA's 5-year review. Who will perform the 5-year review? Will random sampling be conducted? Will an evaluation plan or protocol be developed and in place? How will it be determined whether the cleanup was sufficient or whether the institutional controls are working? What if problems are found?

PREFACE TO EPA'S RESPONSES TO COMMENTS PERTAINING TO INSTITUTIONAL CONTROLS

Institutional controls (ICs) for residential areas are measures necessary to provide long-term protection of the remedy and protect against exposures to residual levels of lead that were inaccessible during the cleanup. Institutional controls for undeveloped areas are also necessary. They are designed to prevent migration of contamination (e.g., wind-blown dust, indiscriminate transport by humans, etc.) from areas such as agricultural fields and provide for orderly, cost-effective means of changing the type of use (e.g., from agricultural to commercial or residential).

This preface provides a summary of the efforts pertaining to ICs that have occurred at the site over the past several years. EPA coordinated the development of institutional controls with Lewis and Clark County, the City of East Helena, and the Montana Department of Environmental Quality. Specific legal language was developed for proposed ICs during this process.

From a risk management perspective, EPA emphasizes that the cleanup levels for lead, arsenic and all other contaminants that are or were present are fully protective. Once the cleanup is complete, residents can engage in any and all activities that they would normally engage in, with minimal risk. However, because no level of cleanup can totally eliminate all of the residual contamination, and because undeveloped areas surrounding the community will continue to have elevated levels of lead for decades into the future—in many cases, in perpetuity—residents should continue to exercise good judgment and take reasonable precautions. These measures, when formalized and put into routine practice, are institutional controls.

Need for Institutional Controls

Irrespective of the selected cleanup action level, there are conditions that exist in East Helena, and the persistence of such conditions calls for long-term institutional controls:

- *Lead-contaminated soils remain in place beneath clean cover soils within some residential portions of East Helena. Within the Prickly Pear floodplain, nearly all yard soils were removed to a depth of 18 to 22 inches, and replaced with clean cover soils. ICs are needed to protect against displacement of the soils left buried beneath the protective cover.*

- *Despite all reasonable efforts to remove and replace lead-contaminated soils of all qualified yards, soils under decks and porches, sheds and garages, sidewalks, large trees, and other inaccessible areas cannot be removed without a significant increase in disruption to the resident. Generally, no more than 75 percent to 80 percent of the lead-contaminated soils of any single residential yard are accessible for removal and replacement. ICs are needed to periodically remind homeowners of such conditions and to ensure proper handling and disposal of soils as these residual, currently inaccessible sources may become open in the future.*

- *Surface soils of approximately 2,500 to 3,000 acres of undeveloped lands surrounding East Helena have lead levels that are currently not suitable for residential use, and may or may not be suitable for recreational or commercial uses. The question of whether and when these lands may be developed cannot be answered at this time. ICs such as best management practices are needed for the long term in order to prevent these soils from becoming a source of wind-blown contamination into residential areas. Periodic monitoring is the most effective and cost-efficient way to manage these undeveloped lands over time. As changes in land use are proposed, such as through a Subdivision Review, county zoning and planning sections*

are best suited to oversee and advise the development.

- *Commercial developments in and around East Helena require soil displacement, leveling, ground preparation, etc. These areas are commonly contaminated with lead above levels that are acceptable for sale or transport to other areas of the Helena Valley. There is currently no legal mechanism, or IC, to prevent such sales or transport out of the East Helena area. Once a Record of Decision is issued, Lewis and Clark County has stated that its proposed regulations will be enacted and administered. They are designed to minimize disturbances and reduce the indiscriminate transport of soil; however, they are neither difficult nor costly.*

- *Interior lead sources, such as dust under carpets, in heating ducts, attics, and earthen basements may present a potential for exposure when renovation or demolition is conducted. ICs, such as a simple, no cost permit system, or education requirement, or both mechanisms, will enable local government to advise the renovator in these cases. The Lead Education and Abatement Program has already incorporated interior lead sources and pathways into its routine education program. The City of East Helena has expressed a willingness to cooperate in continuing efforts to educate and administer "noninvasive" means of minimizing residents' inadvertent exposures during home remodeling or demolition.*

- *Exterior (and possibly interior) lead-based paint of older homes may peel off and re-contaminate areas previously cleaned up. Educational efforts, such as periodic reminders to homeowners to inspect their homes, followed by in-home environmental assessments conducted by health professionals (at no cost to the homeowner) have proven to be an effective IC.*

EPA emphasizes again that the conditions described above, which call for long-term education and administration of reasonable institutional controls, will persist, unchanged, whether the lead cleanup levels are set at their current levels (1,000/500 ppm), at 610 ppm, at 400 ppm, or at any lesser level. Exterior (and possibly interior) lead-based paint of older homes may peel off and re-contaminate areas previously cleaned up. Thus, selecting a lower cleanup action level will have no effect on minimizing, or reducing the need for institutional controls. The single, overarching goal for setting a cleanup action level for East Helena is that it should be protective. EPA believes that it has selected a protective level.

The Montana Department of Public Health and Human Services (MDPHHS) also acknowledges that it is impossible to remove all lead-bearing soils or dust, and has stated that the overall plan proposed by EPA is feasible and desirable. The Department's perspective is that continuation of the East Helena Lead Education and Abatement Program and establishment of other needed ICs will (a) prevent disturbances of contaminated soil that remain in East Helena and (b) prevent human exposure to interior household dust during renovation or demolition. These programs, according to MDPHHS, "must have the highest possible priority."

Lead Education and Abatement Program

A cornerstone of the ICs program for East Helena is the county-administered Lead Education and Abatement Program. It began in 1995, following an agreement between EPA and Asarco to establish and fund a program that would put local health professionals at the forefront of educating the community and advising EPA and Asarco in respect to protecting the children of East Helena from lead. The program developed rapidly into one of the more effective education and abatement programs in the United States.

In 1999, Lewis and Clark County and EPA initiated an evaluation of the Lead Education and Abatement Program. The evaluation included a community survey, an external peer-review, and a series of recommendations. The program's successes were noted, yet recommendations were made to expand the role and importance of local health professionals in managing health risks in the long term. It had become increasingly evident by 1999 that local government and local health professionals are the most logical and most qualified to develop, administer and enforce all aspects of institutional controls that would be needed both presently and in the future. Thus, a coordinated effort was initiated to develop a long-term institutional controls program, and Lewis and Clark County expressed the willingness and a strong desire to take the lead.

Development of Regulations

County officials, including the health officer, division administrator and assistant county attorney took the lead in drafting proposed regulations that would become institutional controls aimed at minimizing the redistribution of residual contaminated soils within the community. The Lewis and Clark City-County Board of Health concluded that specific authority to issue such regulations should be granted to local boards of health, statewide. Therefore, Lewis and Clark County officials took the proposed regulations to the Montana Legislature as an example of the types of regulations that are needed as institutional controls at Superfund sites across the State. EPA and MDEQ concurred. Rep. Chris Ahner, an East Helena resident, sponsored Montana House Bill No. 331, "An Act Authorizing Local Boards of Health in Montana to Adopt and Enforce Institutional Controls at Federal Superfund Sites." The bill was passed into law (50-2-116 MCA) on March 31, 1999.

Shortly thereafter, the Lewis and Clark City-County Board of Health wrote to EPA that it was their intention to utilize the statutory authority and adopt "appropriate measures to protect the remediation which has taken place in the residential areas of East Helena." The May 7, 1999, letter further urged EPA and MDEQ to complete the Record of Decision for East Helena residential soils and undeveloped lands so that the regulations could become effective for East Helena.

Over a period of about two and one-half years following, Lewis and Clark County presided over roughly monthly meetings involving EPA, MDEQ and the City of East Helena. At times, interested East Helena area residents participated. These discussions covered institutional controls that were needed to (a) protect the ongoing removal action, (b) protect the residential cleanup once it is completed, and (c) manage the long-term land use changes anticipated for undeveloped lands.

EPA has steadfastly supported the County's efforts to take the lead throughout ICs development process. The County's draft regulations are attached at the end of the Responsiveness Summary as an example of the degree to which progress on ICs has been made by the County, City, State and EPA.

EPA believes that it has provided a balance between specificity and flexibility in the identification and discussion of ICs in the alternatives. Having general language in the ICs without being too specific allows local entities the flexibility to structure ICs as needed to meet specific community needs and desires. This approach also allows local entities to use existing programs, such as the Lead and Education Abatement Program, and County Planning and County Zoning Departments, in the administration of ICs. EPA has worked closely with Lewis and Clark County and the City of East Helena, and will continue to do so throughout remedial action construction and beyond.

EPA will continue to seek adequate funding for the administration and enforcement of ICs, noting that steps have repeatedly been taken by EPA to support the County's need for funding.

EPA RESPONSES TO COMMENTS REGARDING INSTITUTIONAL CONTROLS

- *In light of Lewis and Clark County's expressed preference for taking the lead in developing ICs for East Helena, and MDEQ's participation in the extensive dialogue that occurred over the years, as explained in the Preface above, EPA believes that it has identified all types of institutional controls that apply to the site. EPA accepted the responsibility to develop ICs and worked with local government to develop them. EPA identified categories of institutional controls and provided examples of situations requiring institutional controls, which the County acted upon. Examples of ICs identified in the Proposed Plan and developed in coordination with the County as the lead include:*

    - *Continue the existing East Helena Lead Education and Abatement Program for as long as necessary*
    - *Continue blood lead screening for children*
    - *Develop and administer institutional controls that will enable the Lewis and Clark City-County Board of Health and City of East Helena to adopt and enforce regulations needed to (a) prevent displacement of contaminated soils that remain in and around East Helena, and (b) to prevent exposures to interior household dust (attics, unfinished basements, heating ducts, etc.) during remodeling or demolition, through the promotion of environmental assessments*
    - *Requirements and protocols for sampling soils prior to development of undeveloped lots or lands, to determine the extent and concentrations of lead and arsenic in soils, and after cleanup, to assure that the cleanup was effective and that development can proceed*
    - *Define requirements and specifications for land use changes, such as when undeveloped lands are proposed for residential, recreational, or commercial development*
    - *Apply Best Management Practices for agricultural land and rangeland communicated through an education program and assessed through inspections. For agricultural land, the Proposed Plan indicated that best management practices included minimum tilling practices and minimization of autumn burning and tilling to reduce the production of fugitive dust. For rangeland, the Proposed Plan primarily identified maintenance of adequate amounts of vegetative cover to control fugitive dust.*

  Final language for institutional controls belongs in the hands of local government, as demonstrated by Lewis and Clark County's extensive efforts. Prior to publication of the Proposed Plan, the EPA, MDEQ, Lewis and Clark City-County, and the City of East Helena met numerous times over several years for the specific purpose of identifying ICs that would be expected to be necessary. The scope of these discussions covered the ICs for both the period during ongoing removal action, and following completion of the final remedy. It was clear to the EPA that Lewis and Clark City-County Health Department expressed a strong desire to take the lead role in both the identification and implementation of ICs. County officials took the lead and drafted proposed BOH regulations. The most recent version of the draft regulations was transmitted to the EPA RPM from Lewis and Clark City-County Board

of Health on April 11, 2006. In this letter, the Lewis and Clark City-County Board of Health indicated that the draft regulations were being provided to EPA specifically for consideration during preparation of the Proposed Plan. These draft regulations are provided in an attachment to this Responsiveness Summary.

- *Information regarding specific content of institutional controls and associated legal language has been provided in the preface and in previous comments. The Proposed Plan (and the ROD) identifies the need to utilize a combination of regulatory controls and education to prevent exposures. Regulatory ICs designed to prevent exposure, such as limitations on activities where soils might be disturbed, are enforceable. In addition, effective communication with the public through education of the existence of the potential risks is a preventative measure. Specific mechanisms for preventing exposures will be identified as a component of the educational program.*

  EPA believes that the ICs have been explained in the Proposed Plan at an appropriate level of detail. The exact details and specific language contained within an effective ICs program, such as regulations and ordinances, are generally worked out during the Remedial Design stage of the Superfund process. In this case, draft regulations currently exist, but EPA will still be available to work with the local entities to revise specific language, if so desired, during the Remedial Design stage. The degree to which institutional controls have been developed and described is consistent with EPA guidance. The EPA guidance document, Institutional Controls: A Site Manager's Guide to Identifying, Evaluating, and Selecting Institutional Controls at and RCRA Corrective Action Cleanups"(EPA 540-F-00-005, 09/2000) identifies the determinations that a site manager should make. These determinations are identified in the table below with the location where they are discussed in the Proposed Plan.

Site Manager Determinations	Proposed Plan – Location of ICs
Objective – clearly state what will be accomplished through the use of ICs.	Objectives of the East Helena ICs are identified in Section 4, Pages 15 and 16, and Section 7, Page 30.
Mechanism – Determine the specific types of ICs that can be used to meet the various remedial objectives.	The types of ICs are identified in Section 5, Pages 17, 18, 19, 24, and 25, and Section 7, Pages 30 and 31.
Timing – Investigate when the IC needs to be implemented and/or secured and how long it must be in place.	Timing is discussed in Section 5, Page 18, and Section 7, Pages 30, 31, and 32.
Responsibility – Research, discuss, and document any agreement with the proper entities on exactly who will be responsible for securing, maintaining, and enforcing the control	Responsibility is discussed in Section 5, Pages 17, 18, 19, 24, and 25, and Section 7, Pages 30, 31, and 32.

The EPA Project Manager provided the local entities with this guidance during the collaborative development of the ICs program. The guidance was used as a benchmark on which to begin, consistent with the way in which guidance is often applied. Should greater detail be required in the future, additional regulations or ordinances may be considered when need arises. In this case, draft regulations currently exist. EPA will continue to be

available to work with local governments, if such is desired, during the Remedial Design and Remedial Action construction phases.

- *State and local governments are responsible for adopting and implementing institutional controls. EPA in the past has successfully secured funding from viable Potentially Responsible Parties for implementation and administration of ICs. EPA has successfully provided for funding through 2008 and is seeking a settlement from Asarco that will ensure long-term funding for administration and enforcement of the ICs program. However, the status of ASARCO's bankruptcy remains unclear. Therefore, EPA must consider the possibility that East Helena may become a Fund-lead site. Although unlikely, if that becomes the case, EPA can only seek funding from national sources, year-to-year, with no absolute assurance that funding will be provided. If it were to become a Fund-lead site, the State of Montana has an obligation to match or fund long-term ICs administration, particularly during operations and maintenance (O&M). The most likely scenario is that necessary funding will be secured.*

  The County has considerable control over costs of the ICs program, by specifying or modifying the type of ICs. For example, EPA and the County have together periodically assessed range conditions over surrounding agricultural lands with assistance from Montana State University. The cost has been minimal, and may in fact be continued as a service to counties through the university's extension services. This simple, yet effective measure allows a qualitative evaluation of range conditions that in turn offers assurances that wind-blown erosion will not become a problem.

  Detailed costs, which include institutional control costs, are provided in the main text of the ROD.

- *Identification of ICs in the Proposed Plan was based on anticipation that they would be effective based on the site-specific needs for East Helena, and experience at other hazardous waste sites. Providing comprehensive case histories of ICs at other sites may be misleading, because effectiveness is a function of how well the local entity implements, administers, and enforces the ICs.*

  Effectiveness of the ICs will be monitored because the site is subject to Five-Year Reviews. Five-Year Reviews are required because the remedy does not allow for unlimited use. These reviews are conducted by EPA no less frequently than every five years to assess the effectiveness of the remedy, and can include both record reviews and on-site inspections. More frequent reviews can be conducted at the discretion of the entities responsible for the ICs. The measure of effectiveness could include such things as determinations of whether the proper permits have been obtained and procedures have been followed during the development of agricultural land. The frequency and content of reviews can be determined during the Remedial Design stage after the remedy has been selected in the Record of Decision, but will be no less than every five years.

- *As stated in the Proposed Plan, it is anticipated that a small portion of the East Fields will continue to be used as a repository. Further cleanup of this area is not planned. The East Fields currently support vegetation and the level of lead contamination in soil disposed in the East Fields in the future is anticipated to allow vegetative cover to continue to thrive. As stated in the Proposed Plan, the long-term management of the East Field repository requires institutional controls, which in this case include Best Management Practices to maintain vegetative cover to minimize generation of fugitive dust. EPA anticipates that the State of*

Montana and Lewis & Clark County, in coordination with the City of East Helena, will manage the institutional controls and have long-term responsibility for them. EPA negotiates with the designated Responsible Parties on cost recovery. Ultimately, the State of Montana has responsibility for sharing costs.

It is conceivable that some new industrial or commercial or recreational use may fit the circumstances present in the East Fields, leaving a small portion of them open for future disposal of small amounts of waste soil assuming a mechanism is found to ensure appropriate ownership and management of the East Fields and subject to approval by EPA, State of Montana, Lewis & Clark County, and City of East Helena.

- *The Preferred Cleanup Alternative in the Proposed Plan includes institutional controls that will enable the Lewis and Clark City-County Board of Health and City of East Helena to adopt and enforce regulations needed to (a) prevent displacement of contaminated soils that remain in and around East Helena and (b) to prevent exposures to interior household dust (attics, unfinished basements, heating ducts, etc.) during remodeling or demolition, through the promotion of environmental assessments. The ICs identified in the Proposed Plan specifically include continuation of the existing East Helena Lead Education and Abatement Program for as long as necessary. The program promotes environmental assessments in homes, including sampling of yard soil, interior dust, drinking water, and lead-based paint in order to identify all sources of and pathways for lead exposure. The program provides broad-based education to the public, in homes, day-care centers and schools. Education efforts are focused on nutrition, personal hygiene, health monitoring (blood lead testing) of area children, "safe play" practices, and risk reduction and management. The program provides information to area residents on the need to avoid areas with elevated soil or dust lead levels and to maintain barriers inside and outside the house. It provides information to future purchasers and sellers of property, lending institutions, and realtors regarding both site-wide and individual property-specific conditions.*

- *The Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P, dated June 2001, is intended to promote consistent implementation of the Five-Year Review process. Section 121 of CERCLA, as amended by SARA, requires that remedial actions, which result in any hazardous substances, pollutants, or contaminants remaining at the site, be subject to a Five-Year Review. The NCP further provides that remedial actions which result in any hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure be reviewed every five years to ensure continued protection of human health and the environment.*

  The Five-Year Review requirement applies, subject to the conditions mentioned above, to all remedial actions selected under CERCLA §121, including institutional controls. Consistent with Executive Order 12580, other Federal agencies are responsible for ensuring that Five-Year Reviews are conducted at sites where Five-Year Reviews are required or appropriate.

  EPA Region 8 is responsible for completing the Five-Year Reviews for East Helena. Two Five-Year Reviews have been conducted to date for the East Helena Superfund Site; the second Five-Year Review was completed on March 31, 2006. The Five-Year Review includes several components, such as site background, response actions, progress since last review, community involvement, site inspections, and technical assessments.

  The East Helena site requires ongoing Five-Year Reviews in accordance with CERCLA § 121 (c). The next Five-Year Review for the East Helena Site will be performed by January 2011,

five years from the date of the second 5-year review in 2006. The remedy elements that are part of OU2 will be part of that Five-Year Review, including institutional controls as previously mentioned, provided the ROD has been signed.

VI. LEAD CLEANUP LEVELS AND PROTECTIVENESS OF HUMAN HEALTH

COMMENTS

- **Jeri Dwan – "Use a lower cleanup level"**

It seems to me that it may be more protective to use a lower cleanup level to ensure that these children are protected. This is particularly true given that the Lead Abatement Program is not necessarily accomplishing all that it attempts to. While the program seems like a great idea, it wouldn't need to be relied on to such an extent if more cleanup work was done. I encourage EPA to use a lower cleanup level and ensure protection of the children of East Helena.

- **Lewis & Clark City-County Board of Health - Develop alternatives to remediate lead and arsenic contamination to health protective levels**

… the BOH believes the Preferred Cleanup Alternative relies too heavily on institutional controls, including community education, which, in turn, minimizes the alternative's long-term effectiveness and permanence. Because institutional controls play a very significant role in the Preferred Cleanup Alternative, the BOH believes it will necessitate in-perpetuity blood lead monitoring of the children of East Helena. In addition, contamination will remain at undeveloped lands (until the land use is changed) requiring the City-County Health Department and other local government entities to oversee these undeveloped lands and their potential, future remedial actions.

It is the opinion of the BOH that additional alternatives should be developed and evaluated that will focus on the Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment and, thereby, maximize the Long-Term Effectiveness and Permanence of the remedy.

Specifically, the BOH requests that alternatives be developed and evaluated with the goal of fully remediating the lead and arsenic contamination in East Helena to health protective levels that would minimize the complexity and longevity of the institutional controls.

- **Moriah Bucy - "More emphasis must be placed on the risks to the people"**

I think that more emphasis must be placed on the risks to the people (specifically the children) of the community and ensuring that the cleanup is done correctly the first time. … I hope that EPA will choose to do the right thing and make sure that the people of East Helena are adequately protected.

- **Moriah Bucy - "Lower cleanup level advocated"**

The lead model resulted in a risk-based cleanup level of 520 ppm lead in soils. It appears that EPA is completely disregarding the model in choosing a preferred remedy that has a "trigger" value of 1,000 ppm. If EPA feels it is important to cleanup soils to 500 ppm in soils that are

"triggered" by a 1,000 ppm concentration, then why not use a "trigger" of something closer to 500 ppm in the first place?

- **Montana Department of Environmental Quality – "DEQ reserves further comment on the proposed action level pending the ATSDR evaluation"**

Earlier in 2007 DEQ requested the Agency for Toxic Substances and Disease Registry (ATSDR) to evaluate the protectiveness of the proposed soil lead action level of 1,000 ppm compared to the RBC. ATSDR recently informed DEQ that they would complete their evaluation after close of the public comment period. Therefore, DEQ reserves further comment on the proposed action level pending the ATSDR evaluation.

- **Montana Department of Environmental Quality – "Reduce reliance on education"**

DEQ agrees that the Lead Program has been strong and effective with its outreach and education in helping to reduce exposure to lead and arsenic in the past, and acknowledges that the should continue in the future. However, reducing children's exposure to soils where lead levels remain above the RBC relies on the parent's knowledge and intervention actions. The proposed plan discussed the possibility of "lower awareness of residents, who may revert to behaviors that increase the risks from the remaining lead and arsenic." This possibility exists even with the Lead Education and Abatement Program. Remediating residential soils to the risk-based lead cleanup levels is more protective and effective and has more long-term permanence. Thus, DEQ supports the more protective alternative of removing yard soils with soil lead levels greater than the RBC, thereby eliminating the unacceptable soil exposure pathway. DEQ proposes the remedial action objective should be to remediate residential yard soils to risk-based lead levels that reduce children's lead exposure. This will reduce the reliance on education.

- **Christine Deveny, Vice Chair, Lewis Clark City-County Board of Health, and Melanie Reynolds, M.P.H., Health Officer, Lewis and Clark City-County Health Dept. – "Preferred cleanup relies too heavily on institutional controls"**

The BOH has concerns regarding the long-term protectiveness of the preferred cleanup alternative and believes it relies too heavily on institutional controls like community education and blood lead testing. Clearly, an education and testing program would always be subject to adequate funding levels, advocate support, and changing political priorities. Our preference is for a remedy that would eliminate, or at least substantially reduce, the need for perpetual oversight, monitoring, education and intervention. We believe lower cleanup levels may achieve that objective.

<u>EPA RESPONSES PERTAINING TO LEAD CLEANUP LEVELS AND PROTECTIVENESS OF HUMAN HEALTH</u>

The cleanup levels for lead and arsenic in soil are protective for children and adults. Reduction of risks for young children was the highest priority for EPA, and those risks have been reduced significantly. Residents and visitors can engage in all activities that they would normally engage in, with minimal risk and reasonable precautions.

Multiple criteria formed the basis of the remedial decision when selecting a final cleanup level within that plausible range. These criteria included the quality and quantity of the environmental data collected, the quality and quantity of the biological data collected, and the most current scientific studies available. The cleanup levels for lead and arsenic were developed using the risk assessment process recommended by existing EPA guidance documents. The cleanup levels are

within the range of cleanup levels selected for lead and arsenic at other mining and smelting sites in Region 8.

Responses to Category I, Children's Blood Lead Test Results, discuss and explain why the East Helena blood level data are reliable for drawing conclusions about the site, how the data and associated statistics show the lack of any meaningful correlation between soil lead data and blood lead data at the concentrations of soil lead remaining in East Helena, and how the data show that the cleanup levels are protective. EPA's responses to Category II, East Helena's Role in Development of National Lead Guidance, discuss why the use of blood lead data is consistent with guidance.

The risk-based cleanup levels for lead in soil are protective for all residents of East Helena, particularly for the most susceptible: children. The concept that a lower cleanup action level "may be more protective," appears to have arisen from an assumption that soils with lead above about 800 to 1,000 ppm are unsafe, yet soils less than about 520 to 600 ppm are safe. However, there are no empirical data to support that assumption. In fact, numerous lines of empirical evidence gathered over many years, involving over 1,700 East Helena children, thousands of soil samples, decades of air quality data, and results of several hundred in-home environmental assessments conducted by qualified health professionals, all lead to the conclusion that the cleanup levels are protective, and that several other factors besides soil, including lead in paint, family hobbies, father's occupation, and an air pathway that disappeared when the smelter closed down, were as important to interrupt as the soil pathway, if not more important.

EPA notes that the Agency for Toxic Substances and Disease Registry (ATSDR), in response to a formal request by MDEQ for a Health Consultation, evaluated the environmental health aspects of the remedy for residential properties to determine whether it is protective of human health. ATSDR is a federal public health agency of the U.S. Department of Health and Human Services independent of the EPA. ATSDR serves the public by using the best science, taking responsive public health actions, and providing trusted health information to prevent harmful exposures and diseases related to toxic substances. The ATSDR concluded that the lead levels that trigger cleanup (1000/500 ppm) for residential areas are protective of human health as long as institutional controls and the Lead Education and Abatement Program are included in the final cleanup remedy(see ATSDR's Health Consultation included as Appendix C to the ROD).

Cleaning up soils to a level of 500 ppm, when the trigger is exceeded does not imply that EPA believes lead levels above 500 ppm are of concern. If a yard cleanup is triggered, the goal is to reduce the concentration to a level that is well-removed from the trigger—and therefore protective--and reasonably cost-effective. This provides an extra margin of safety in the cleanup, but also is within the realm of reasonableness in terms of cost. EPA has presented ample evidence that the trigger level for East Helena, which is uniquely suited to the variability within individual yards, is well below the level of concern for lead in soil and therefore protective.

EPA emphasizes again that the conditions described above, which call for long-term education and administration of reasonable ICs, will persist, unchanged, whether the lead cleanup levels are set at their current levels (1,000/500 ppm), at 610 ppm, at 400 ppm, or at any lesser level. Exterior (and possibly interior) lead-based paint of older homes may peel off and re-contaminate areas previously cleaned up. Because of this, and because the 1,000/500 ppm cleanup level for lead and 100 ppm for arsenic are fully protective, more stringent ICs would be contrary to other EPA guidance. Thus, selecting a lower cleanup action level will have no effect on minimizing or reducing the potential need for ICs. The single, overarching objective for setting a cleanup action level for East Helena is that it should be protective. EPA has accomplished that objective.

As discussed in Category I above, it is unlikely that the low blood lead levels observed in East Helena are due to public education and awareness. Previous study results suggest that awareness of lead hazards may result in temporary changes in behavior which reduce exposure to lead hazards and blood lead levels, but the changes are not long term. Although the current program of lead education is valuable in providing citizens with knowledge they may utilize to minimize risk from lead exposure, EPA does not believe that this program could be responsible for modifying behaviors to the extent that it could account for the steadily decreasing trend in blood lead levels over the last 15 years, and for the consistent low levels remaining over the last several years.

Regardless of the cleanup level, some lead-bearing soil will always remain, as the Montana Department of Public Health and Human Services and the U.S. Agency for Toxic Substances and Disease Registry have also acknowledged (see ATSDR's Health Consultation included as Appendix C to the ROD). Even if the cleanup level was set at a natural, background lead concentrations, conditions would exist that require long-term institutional controls. The State's Medical Officer agrees with EPA in concluding that continuation of the East Helena Lead Education and Abatement Program and establishment of other needed ICs will (a) prevent disturbances of contaminated soil that remain in East Helena and (b) prevent human exposure to interior household dust during renovation or demolition. These programs, according to MDPHHS, "must have the highest possible priority."

Continuing education is highly desirable to parents and educators in this community. The Lead Education and Abatement Program should continue for that reason, but the program also should continue for the reason that, regardless of the cleanup action level, institutional controls will be necessary in the community and the program is best suited and qualified to administer, or act as liaison or coordinator for, institutional controls both presently and in the future.

VII. UNDEVELOPED LANDS AND FUTURE CHANGES IN LAND USE

COMMENTS

- **Laura and Brian Vachowski – Landowners should not bear cleanup costs**

  The proposed plan states that "landowners seeking to change the use of undeveloped land . . . will bear all associated cleanup costs." Such a requirement flies in the face of both CERCLA and EPA's own internal guidance. Under CERCLA, innocent landowners such as ourselves, bona fide prospective purchasers, and contiguous property owners are conditionally exempt from any cleanup costs associated with contamination in Superfund sites. Moreover, the EPA Superfund Lead-Contaminated Residential Sites Handbook (August 2003) plainly states, "EPA ... generally will not take CERCLA enforcement actions against an owner of residential property unless the residential homeowner's activities lead to a release or threat of release of hazardous substances resulting in the taking of a response action at a site." See Handbook at pg. 62. EPA's proposed plan essentially constitutes an enforcement action against residential landowners and attempts to circumvent both the spirit and black letter law of CERCLA, as well as the EPA's own guidance, by trying to hold residents liable for the cleanup of contaminated areas. Such an attempt is not only inappropriate, but likely illegal.

- **Montana Department of Environmental Quality – Landowners should not bear cleanup costs**

  The proposed plan states, "Developers or landowners… will bear all associated cleanup costs." The selected remedy should not state that developers and landowners will pay for remediation. Certainly developers and landowners could work out an agreeable arrangement with the Potentially Responsible Parties (PRPs) but specifically identifying liability of developers and landowners is not a component of the remedy. Allocating liability is not part of the remedy; the liability should remain with the PRPs. The Proposed Plan also states, "Undeveloped lands are being developed, and proposed for development, in the vicinity of East Helena." The Record of Decision addresses that anticipated land use. The Lead Sites Handbook states that EPA generally will not take CERCLA enforcement actions against an owner of residential property. In addition, the Handbook notes that landowners may qualify under CERCLA for protection from CERCLA liability as a contiguous property owner, bona fide prospective purchaser, or innocent landowner.

- **Montana Department of Environmental Quality**

  Remove the requirement that CERCLA liability shifts the responsible parties to the property owners and developers.

- **Lewis & Clark City-County Board of Health – Undeveloped land cleanup cost responsibility**

  The Proposed Plan indicates (p. 25) that developers or landowners that wish to change the use of undeveloped lands must meet all the requirements and specifications for the new use and will bear all associated cleanup costs. This element of the Preferred Cleanup Alternative could have significant economic impacts to the community of East Helena. Therefore, the EPA should provide justification for transferring the cost of cleanup of undeveloped lands from the PRP to the landowner and/or developer. EPA should also provide a legal analysis regarding liability under the Comprehensive, Environmental Response, Compensation and Liability Act (CERCLA) describing how the liability is transferred from the PRP to the landowner/developer.

- **Moriah Bucy - Cleanup cost responsibility**

  The idea that landowners who currently have undeveloped land should be responsible for paying cleanup costs should they decide to develop the property is outrageous. Not only that, but those who currently have a home on property that may later be subdivided may end up in a situation of having to cleanup their undeveloped property to a more stringent level than where they currently live. Again, this brings up the issue of the cleanup level. If EPA feels that 500 ppm is protective for future development, then why should those of us who live in the East Helena be less important?

- **Montana Department of Environmental Quality - "Include total estimated costs for the undeveloped lands"**

  The proposed plan provided "total costs" in the estimates for cleanup of the railroad right-of-way and water conveying ditches but not for the undeveloped lands. The Record of Decision should include total estimated costs for the undeveloped lands.

- **Laura and Brian Vachowski – "Proposed plan fails to include any cost estimate for future development of undeveloped residential areas"**

  The proposed plan fails to include any cost estimate for future development of undeveloped residential areas similar to our property.

- **Lewis & Clark City-County Board of Health – "Will undeveloped lands be monitored only through institutional controls"**

  Page 1, 1st paragraph 3 (of the Proposed Plan) -The proposed plan applies only to existing residential soils and offers recommendations only for undeveloped lands. Will undeveloped lands be monitored only through institutional controls after the Record of Decision (ROD) is approved?

- **Lewis & Clark City-County Board of Health – "Deep tillage should not be presented as a treatment remedy"**

  The BOH has concerns with the implementability of the deep tillage remedy for undeveloped lands proposed under the Preferred Cleanup Alternative. These concerns must be addressed prior to the selection of the Final Cleanup Alternative. These concerns are listed below:

  In Place Treatment - deep tillage should not be presented as a treatment remedy, nor is it an innovative technology (it has been used on sites for many years, and was included as an option for undeveloped lands in East Helena more than 16 years ago; Hydrometrics 1991). Deep tillage dilutes the contaminant concentration in the surface soil through mixing with deeper soil. Further, EPA's characterization of the "reductions" in lead concentrations are misleading, as the Proposed Plan does not point out that the total mass of contaminant in the subsurface is not lessened by tilling.

  Mobilization - deep tillage may mobilize contaminants to concentrate in other, deeper strata at levels even greater than were found in the target shallow zone. The BOH believes the EPA should provide a more detailed assessment of the mobilization potential associated with this remedy.

  Rocky geology - rock out-croppings in the surface and near surface geology may prevent effective deep tillage of soils. In a treatability plot performed in the Asarco West Field, the maximum attainable tillage depth was 20 inches even with prior field preparation using a dozer to rip to 15 inches below ground surface (Hydrometrics, 1997). The desired tillage depth for the treatability plot was 30 inches. Considering that numerous subsurface rocks will likely be encountered in many locations, the BOH believes the EPA must provide an alternate remedy for such locations conditions.

  Increased soil volume -deep tillage will likely increase the volume of soil as "loose" soil volumes are typically significantly greater than "compact" soil volumes. The Preferred Cleanup Alternative must consider options for the increased soil volume, particularly if the approach is not successful in achieving the lead and arsenic cleanup levels.

  Weed management -disturbance of soil through deep tillage may cause weed infestation problems. Weed management practices and funding should be considered for the Preferred Cleanup Alternative.

- **Montana Department of Environmental Quality – "EPA Handbook explains that tilling is not an acceptable cleanup method for lead soils because it is not protective"**

  One of the alternatives for undeveloped lands in the proposed plan is Place Treatment (or tilling). The EPA Lead Sites Handbook explains that tilling is not an acceptable cleanup method for lead soils because it is not a protective remedy. This is because no lead removal occurs, and adequate mixing of soil is difficult, if not impossible, to achieve. The handbook further states that tilling may increase the volume of soil, which ultimately requires remediation. The Record of Decision needs to be more precise in its discussion of tilling as a remedy.

  DEQ agrees that in limited site-specific situations, such as non-residential surgical contamination, tilling may be appropriate; however, tilling failed in the Uttick Subdivision in East Helena. After much effort and numerous tilling passes and subsequent sampling, most soils still contained lead above the negotiated cleanup level and had to be excavated and replaced. This was due to the deposits in the flood channels, which had much higher contaminant levels. The adjacent Fields would likely also not be amenable to tilling due to similar fluvial deposits. Also, the rocky sub-soils in the undeveloped land surrounding East Helena may make deep tilling difficult to implement.

  The Record of Decision needs to define the sampling protocols and the decision criteria for suitability of tilling.

- **Laura and Brian Vachowski – "Capping undeveloped property is not a feasible final remedy"**

  Capping undeveloped property is not a feasible final remedy and should not have been included as if it were one. Any cap put in place will only be disturbed when development occurs. At the most, capping is a temporary, remedy.

<u>EPA RESPONSES PERTAINING TO UNDEVELOPED LANDS AND FUTURE CHANGES IN LAND USAGE</u>

Cost responsibility

EPA's response actions under Superfund are not an enforcement action against landowners. Over the last two decades, Congress has enacted a series of amendments to CERCLA that reflect rules and policies EPA has adopted to address landowner liability issues. Among these are the innocent landowner defense to liability set out in the 2002 amendments to 42 U. S. C. Section 9607(b)(3). This provision protects an innocent landowner who did not know or had no reason to know about the contamination before purchasing the property. This defense is premised on the innocent owner of contaminated property taking "reasonable steps to stop any continuing release, prevent any threatened future release, and prevent or limit any human, environmental or natural resource exposure to any previous release . . .." In addition to the requirement for reasonable steps, an innocent landowner is required to "comply with any land use restrictions and institutional controls established in connection with a response action." 42 U. S. C. Section 9601 (35)(A)(i). Compliance with institutional controls established by the County or other local government entity to control future development of land and to control handling of residential contamination that may remain in place would constitute "reasonable steps."

The ROD makes it possible for developers to bear the cost of development, but does not make it mandatory. In fact, this provision was included after consulting with local landowners and developers, who were concerned that Asarco's bankruptcy might languish for years, or worse, leave Asarco unable to cover any such remedial costs. Given affordable means of preparing undeveloped land for residential use, as is provided for by the proposed plan's preferred remedy, developers and landowners have some control over their own investments.

This provision does not necessarily excuse Asarco from liability. EPA has sought to receive a settlement on behalf of private landowners whose lands have been impacted by the smelter's operations. Nevertheless, it is possible that Asarco's liabilities will be capped, nationally, thus leaving EPA with little choice but to enable private landowners or developers to bear some or all of the costs that might be required to bring undeveloped lands into conformance with a new use. The precedent for such circumstances has already been set at other Superfund sites. The provision is consistent with both policy and law. It enables landowners and recognizes the reality of a prolonged, complex and uncertain bankruptcy proceeding.

The Superfund Lead-Contaminated Residential Sites Handbook (EPA 2003) (Handbook) states, "However, it is not the intent of EPA to clean up tracts of remote, undeveloped, lead-contaminated land that may be developed into residential lots in the future. ***This clean-up responsibility should be borne by the land developer. Institutional controls should be developed to ensure safe development in these areas, since under CERCLA developers could be held liable for improper cleanup." In addition, OSWER Directive 9355.7-04 states, "If landowners or others decide at a future date to change the land use in such a way that makes further cleanup necessary to ensure protectiveness, CERCLA does not prevent them from conducting such a cleanup as long as protectiveness of the remedy is not compromised. In general, EPA would not expect to become involved actively in the conduct or oversight of such cleanups." [Emphasis added]*** *The Proposed Plan includes cost estimates for alternatives associated with undeveloped land.*

- *The Proposed Plan applies to both existing residential areas and undeveloped lands. However, EPA presented a separate preferred remedial alternative for each property type. Whereas the preferred remedial alternative for residential properties is removal and replacement, if the property requires it, the preferred remedial alternative for undeveloped lands is dependent upon the new, proposed use. If the new use is residential, and the undeveloped lands do not already conform to the requirements of that new use, then in place treatment is the preferred remedial method. Other uses, such as commercial or recreational uses, may not require anything more than land preparation such as leveling or paving, or a cap of topsoil and sod.*

- *Undeveloped lands will be monitored, as needed, after the Record of Decision. Undeveloped lands do not currently present unacceptable risks to nearby residential areas, or to occasional users or to agricultural workers. Practical application of institutional controls is already being done and the County has processes in place to cover changes in land use. Five-year Reviews are conducted by EPA no less frequently than every five years to assess the effectiveness of the remedy, and can include both record reviews and on-site inspections. More frequent reviews can be conducted at the discretion of the entities responsible for the*

ICs, although EPA does not see a need for that.

In-place treatment (deep tillage and amendment)

- *Deep tillage with lime or other suitable chemical amendment is recognized as a treatment technology. This method has been successfully used at other sites, as well as East Helena.*

  Deep tilling with the use of a modified Baker plow was evaluated at East Helena. This plow is a large disc implement used in agriculture for the deep tilling of soils. Use of the Baker plow in the East Fields area demonstrated the following:

  - *Lead concentrations in surface soils were reduced to safe levels*
  - *Subsurface soil lead concentrations were increased slightly to moderately, yet not to levels of concern*
  - *Soil pH was raised, thus reducing bioavailabilityof lead*
  - *Mixing of the soil profile in the plow zone significantly reduced the metals/pH gradient*

  The method described as being inappropriate in EPA's Handbook is rototilling. Rototilling is a shallow soil tilling method that does not amend the soil profile. Deep tillage is widely recognized as a treatment technology throughout the western United States. Many reclamation scientists—perhaps the majority--consider in place treatment of soils for metals amelioration as an innovative technology. They note further that the technology has undergone significant improvement in terms of equipment, application and effectiveness in the past decade. Indeed, the State of Montana plans to employ this technology on a massive scale in the Clark Fork River floodplain.

  The deep-plow mixing technology was successfully used in 1995-1996 to reduce contamination in surface soils of a 40-acre agricultural tract on the outskirts of East Helena. Before treatment, surface lead concentrations were as high as 2,800 ppm and averaged 1,500 ppm. After treatment, the highest surface soil lead concentration was 550 ppm (2 of 40 tests were slightly greater than 500 ppm) and the field average was slightly less than 400 ppm lead. Depth of incorporation of lead into the soil profile did not cause lead to exceed 150 to 250 ppm below 10 to 12 inches beneath the surface. The cost of remediation was a fraction of what removal and replacement would have cost. And, importantly the environmental impact to another 40 acres or more of farmlands in the Helena Valley, which otherwise would have required strip mining of topsoil, was avoided. A new school and about 120 homes and apartments were built shortly after the land was treated and groomed.

  EPA is unaware of studies that suggest that deep tillage may mobilize contaminants to deeper strata to the extent that concentrations of contaminants are greater than those found in the target shallow zone. Deep tillage may redistribute contaminants, but experience and studies have shown that the redistributed concentrations are less than the pre-till surface concentrations.

  The desired tillage depth is partly dependent on the level of contamination, the distribution of contamination in the vertical soil profile, and on the composition of the site soils. The desired end use of land is also an important factor. Deep tillage with chemical amendments is a suitable and effective alternative for undeveloped lands that, once they are characterized and evaluated in terms of their ability to meet post-treatment criteria, demonstrate that in place treatment is likely to be successful. Post-sampling results after tilling will be available to assess the success of tilling. In East Helena's Utick Subdivision, where deep tillage was

demonstrated, a small percentage of the total area treated did not meet post-treatment criteria. Inadequate depth of tillage appeared to be the cause, and those areas were excavated and replaced with fresh backfill soil.

In the case of the Utick Subdivision, it is important to note that (a) post-treatment sampling revealed that criteria were not met, (b) the problem was readily corrected, and (c) the cost associated with preparing this 7-acre field for residential development was substantially less, despite having to perform partial removal and replacement, than if the area had undergone total removal and replacement. Within two to three years after the Utick Subdivision was treated, the area was fully developed with affordable homes for low-income families.

In areas where tilling does not appear likely to be successful or to be feasible, other alternatives such as capping and excavation, which are identified in the Proposed Plan, can be considered by landowners and developers contemplating changes in land use that would require a remedial action.

The potential increase in soil volume would only need to be considered if the soil was excavated. Deep-tilling does not significantly increase the soil volume for soil that remains in place. The elevation of the land will remain essentially unchanged from before tilling to after tilling.

Sites that are deep tilled are planned for further development. Therefore, the tilled area would reasonably be expected to be landscaped or built upon, which indirectly addresses weed management. In any case, imported soil (following removal) presents just as many challenges for controlling weeds as any other soil disturbance.

- *EPA agrees with MDEQ regarding sampling protocols and decision criteria; however, final protocols and criteria may not be fully developed until remedial design. Whether to specify sampling protocols and decision criteria is left to the local entities. Existing methods for predicting success and for determining depth of tillage, lime application rates, etc., are well developed for East Helena largely because of the lessons learned from site-specific applications of the technology and demonstration projects discussed above. Ultimately, the results of sampling and remediation, whether by treatment with tilling and amendments or by other means, will need to meet the remedial action objectives for the site that have been identified in the Record of Decision.*

- *Capping has been used at numerous metal-contaminated sites including Anaconda and Butte. The ROD for the Butte Priority Soils Operable Unit (BPSOU) includes engineered covers (soil with vegetation) or other covers to address solid media in non-residential areas including commercial areas and open areas where concentrations of lead or arsenic may exceed action levels. Capping (covers) has been used successfully at other sites for creating open space parks where more expensive alternatives would have prevented remediation of the site. The handbook (EPA, 2003) recommends capping in residential settings as an effective, affordable method of remediation of lead-impacted soils. Capping is a viable remedy at East Helena for undeveloped land under certain situations as described in the Proposed Plan.*

VIII. SELECTION OF REMEDIAL ALTERNATIVES

COMMENTS

- **Steven D. Helgerson, MD, MPH, State Medical Officer, Montana Department of Public Health and Human Services – "Protecting the public's health with regard to exposure to lead"**

  I am writing in response to "Plans for a final cleanup of East Helena's residential soils and undeveloped lands" which EPA announced in January 2007 for the East Helena Superfund site (Operable Unit No. 2). My comments concern the parts of the plan that, in my view, are the most important for protecting the public's health with regard to exposure to lead.

  While it would be ideal to eliminate lead and other heavy metals from areas both exterior (e.g., soil) and interior (e.g., dust or old paint) to living units, it is not feasible to achieve this ideal. In contrast, the plan proposed by the EPA appears to be feasible. The plan included cleanup of a residential yard in which any quadrant has soil with lead concentration exceeding 1000 ppm. Cleanup in those yards would include all areas with lead concentrations exceeding 500 ppm.

  I agree this reduction in soil lead concentration is desirable. However, because it is impossible to remove all lead-bearing soils, there will continue to be a risk of ambient exposure in people's living environments from contaminated dust (not to mention lead-based paint), and continuing efforts to minimize those exposures will be important. As long as any lead concentration is detectable in interior dust, the following parts of the EPA proposed plan are essential for protecting he public health:

  A. Continue the existing East Helena Lead Education and Abatement Program, and
  B. Establish institutional controls that prevent disturbances of contaminated soil that would remain in East Helena, and prevent human exposure to interior household dust during renovation or demolition of existing housing stock in East Helena.

  Achieving these parts of the EPA proposed plan must have the highest possible priority. To the extent funds are available to implement and evaluate implementation of the proposed plan; these funds need to be preferentially targeted to these components of the plan.

- **City Council of East Helena - Unanimous in Support of Alternative 2R**

  The City Council of East Helena has been involved in its area's Superfund Cleanup since inception. The City Council wants to be on the record as having unanimously voted in support of Alternative 2R of the Proposed Record of Decision by the EPA.

  It is our belief that the blood lead studies show that the clean up program has been a success. The children in East Helena have lower blood levels than the national average. When the program started, the action plan was to clean a yard if any quadrant contained lead levels in excess of 1000 ppm. This action level has remained to date. The information provided during the public meeting in East Helena on January 25, 2007, clearly demonstrates that no benefit would be gained by changing that action level.

  … It is the City Council's belief that yard cleanup at the existing action level in

conjunction with the Lead Education Program appears to be the reason the program has been such a success. The evidence just doesn't support changing that action level when there is no expectation of blood level improvement. Nor does it support the expenditure of many more thousands of dollars.

The City Council is hopeful you will choose Alternative 2R of the Proposed Record of Decision. It is time for the superfund status of the City of East Helena to come to an end and allow us to look forward to the future.

- **East Helena Public Schools - Support for Finalization of the ROD**
  Joe Cohenour, Chairman
  Marcia Ellermeyer, Vice-Chair
  Mark Diehl, Trustee
  Don Hoffman, Trustee
  Kit Johnson, Trustee
  Ann Marie Thompson, Trustee

  The East Helena Public Schools (EHPS) Board of Trustees would like to express their support for the finalization of the EPA Record of Decision (ROD). We believe that the ROD is an essential element to the continued well being of our community, its citizens and our children. We believe that the scientific evidence that has been examined by experts in the field has sufficient credibility to support the finalization of this decision. Realizing that this evidence has been examined extensively we now request that the plan be completed quickly for the well being of our community.

  The EHPS Board of Trustees strongly supports the ideals of protection of human health and the environment. As a board we believe that the continued support of the EPA, DEQ, Lewis & Clark County officials and the Asarco Corporation will create an umbrella of oversight that guarantees the continued good health of our community from unforeseen challenges.

- **Montana Department of Environmental Quality – Supports selected components of the preferred alternative**

  DEQ supports the following components of the Preferred Alternative:

  - Continuing the existing East Helena Lead Education and Abatement (Lead Program) for as long as necessary to help reduce children's exposure to lead.
  - Completing cleanup of streets, alleys, road aprons, irrigation ditches and railroad right-of-way that are adjacent to or within residential areas.
  - Establishing institutional controls to prevent disturbance of soils, prevent exposure to interior dust, and to define land use changes.

- **Chris Anderson, East Helena Resident – Supports "the two-year plan"**

  I'd like to show my support for the Record of Decision and the two-year plan.

- **Baker Botts LLP, representing ASARCO LLP - Adopt Alternative 2R for residential settings and Alternative 4U for future development of undeveloped lands**

  ("ASARCO") submits the following comments regarding the United States Environmental

Protection Agency's ("EPA's") Proposed Plan for soil in Operable Unit 2 of the East Helena Super Fund Site ("Proposed Plan"). As outlined in more detail below, ASARCO generally supports EPA's selected cleanup alternatives both for residential and undeveloped areas.

Residential Soils

- Alternative 2R is an effective choice for addressing residential soils.
- ASARCO agrees with EPA's selection of Alternative 2R to address residential soils in East Helena. As noted in the EPA's announcement of the Proposed Plan (the "Announcement"), Alternative 2R consists of completing the residential soil cleanup according to protocols that are currently in place for the ongoing removal action." Implementation of these protocols has significantly lowered children's blood-lead levels in East Helena.
- Alternative 2R is superior to Alternative 3R as the most cost-effective alternative.
- In Choosing removal alternatives: EPA must select a remedy that is consistent with CERCLA and the nine National Contingency Plan (NCP) criteria. Of the nine criteria, two are viewed as threshold criteria—protection of human health and the environment and compliance with applicable or appropriate and relevant requirements ("ARARs"). ...Alternatives that meet these threshold criteria are to be compared to one another based upon the remaining seven criteria. As noted by EPA, Alternative 2R and 3R are functionally equivalent as to the threshold criteria. … Of the remaining seven criteria, cost-effectiveness is the one that most distinguished Alternative 2R from Alternative 3R.
- EPA estimates that Alternative 3R will be almost four times as expensive to implement as Alternative 2R - $38 million versus $10 million. As previously noted, Alternative 3R does not provide any comparative advantage as to protection of human health and the environment or compliance with ARARs. Accordingly, this cost discrepancy alone is enough to warrant adoption of Alternative 2R as the appreciably more cost-effective remedy.
- The selection of the most cost-effective remedy among various options - all being generally equivalent in terms of protection of public health and the environment, has long been a central tenet of CERCLA. …
- ASARCO believes that selection of Alternative 2R is on all fours with the requirements of CERCLA and the NCP.
- Community acceptance strongly favors adopting Alternative 2R instead of Alternative 3R.
- As noted by EPA, key constituencies including the East Helena City Council and the Lewis and Clark City-County Board of Health have expressed support for Alternative 2R. … As a member of the East Helena community, ASARCO supports the adoption of Alternative 2R. Moreover, judging by the comments made by various citizens in public meetings concerning the adoption of this Proposed Plan, the vast majority of local citizens in East Helena support the adoption of Alternative 2R. Indeed, many of the vociferous objections voiced at these meetings were from citizens concerned that EPA would implement Alternative 3R and needlessly inconvenience the people in East Helena with an unnecessary program of more extensive remediation.

Undeveloped Land

- For the same reasons outlined above, ASARCO agrees with EPA's selection of Alternative 4U to address undeveloped lands in East Helena.

Conclusion

- In light of the foregoing, ASARCO respectfully urges that EPA formally adopt Alternative 2R as the preferred alternative for residential soils and Alternative 4U as the preferred alternative for undeveloped land at the East Helena Site. We appreciate the opportunity to submit these comments and would welcome a chance to discuss these alternatives with EPA at a convenient time.

- **Christine Deveny, Vice Chair, Lewis Clark City-County Board of Health; Melanie Reynolds, M.P.H., Health Officer, Lewis and Clark City-County Health Dept. – "EPA has not substantiated the rationale for selection of the Preferred Cleanup Alternative"**

  Our review of the Proposed Plan and numerous supporting documents, including epidemiological and toxicological studies as well as EPA guidance and reports from other similar projects at listed National Priorities List (NPL) sites, has convinced us that EPA has not substantiated the rationale for selection of the Preferred Cleanup Alternative. Our reasons … are generally based on a lack of supporting documentation, inconsistency with EPA guidance, and the use of uncertain assumptions by EPA to document contaminant exposure potential and predicted health risks.

- **Lewis & Clark City-County Board of Health – "Range of alternatives for residential soils was too limited"**

  The BOH does not believe a sufficient number of cleanup alternatives were developed in the Proposed Plan. In particular, the range of alternatives for residential soils was too limited. The Proposed Plan does not:

  - Describe the other remedial alternatives that were considered and dismissed from consideration; or
  - Provide rationale for why protective remedies (such as testing of indoor spaces and insulation removal, where warranted) are not included in the alternatives.

  EPA should expand the development of alternatives to allow for a more thorough review of potential remedies for East Helena soils. Funding mechanisms should be included in and described for all of the alternatives.

- **Lewis & Clark City-County Board of Health – "The Proposed Plan does not appear to conform with EPA guidance or statutory requirements"**

  The BOH has concerns that the Proposed Plan does not appear to conform with EPA guidance or statutory requirements. In particular, the lack of transparency in development and screening of alternatives has prevented the public from understanding the range of possible alternatives considered, or the benefits and drawbacks associated with these options. Typically, a proposed plan is tiered from a remedial investigation/feasibility study (RI/FS), which provides the detailed supporting documentation for possible alternatives: costs, effectiveness, technical feasibility, and so forth. However the only RI/FS referenced in the Proposed Plan dates to 1991 (Hydrometrics, 1991). Considering the 16 years of experience EPA has gained since that RI/FS, studying and attempting to remediate metals-contaminated sites across the U.S., there surely have been technological and policy advances that should be incorporated into the alternatives. It should be noted that most of the EPA guidance concerning risk assessment, remedial actions, site studies, and decision-making has been

published or revised since 1991, strongly indicating that the sole RI/FS for soils cleanup should have been revised, or at least supplemented, before publication of a Proposed Plan.

EPA has indicated that the RI/FS has been updated, and notes on page 17 of the Proposed Plan: "Many of the alternatives developed at that time, however, are no longer considered viable; due principally to the substantial amount of cleanup that has since occurred. Therefore, EPA developed new alternatives that incorporate many of the features of the original alternatives, but are relevant for current conditions." If this is the case, EPA should provide the new analysis disclosing how and why some alternatives are no longer viable. The supporting documentation for new alternatives should be made available to the public for review, and the Proposed Plan should specifically reference these documents.

One example of the problems raised in using a 15+ year old RI/FS is conformance with guidance and statute. For example, as noted in the Proposed Plan (page 26) the alternatives must be evaluated against nine criteria. One of the threshold criteria that must be met is compliance with state and federal regulations (i.e., Applicable or Relevant and Appropriate Requirements [ARARs]). The Proposed Plan indicates the EPA has evaluated the alternatives for compliance with ARARs, but there was no documentation referenced or available for public review that would substantiate this conclusion. The only document discussing ARARs that we found applicable to the East Helena residential soils is the 1991 RI/FS (Hydrometrics, 1991). It is reasonable to expect that some state and federal regulations will have changed since that time, and an updated analysis is critical. If this has been done (for example, with the "new" alternatives that EPA references on page 17 of the Proposed Plan) then EPA should make the analysis readily available to the public.

Similarly and in general the EPA should supply a specific list of reference documentation pertinent to the Proposed Plan. Otherwise, it is very difficult for the public and public agencies to identify and locate documentation relevant to the subject.

According to EPA guidance, the Proposed Plan should provide "either a summary of the support agency's agreement with the plan or its dissenting comments (EPA 1999c). This requirement is clearly supported by statute, as "EPA must respond to State comments ...on the Preferred Alternative when making the RI/FS and Proposed Plan available for public comment" (NCP §300.515(d)(4)). A responsiveness summary addressing comments from MDEQ was not included in the Proposed Plan. By not making interested parties fully aware of dissenting comments and publishing them in the proposed plan, EPA has failed to meet its statutory public disclosure obligations or follow its own guidance for the CERCLA decision-making process.

- **Sally K. Nyland – "I favor Alternative 3R"**

I am strongly opposed to the "preferred cleanup alternative (2R)" recommended by the EPA and I favor Alternative 3R for the following reasons:

The State MDEQ has raised sufficient concerns and questions over the 1000 ppm limit as opposed to the 500 ppm in that lead blood level tests in children are based on a biased sampling of participants rather than a random sampling. The use of biased sampling is not scientific and does not lead to reliable test results.

The EPA by their own analysis has presented a different standard for "Clean up Goals for Undeveloped Lands" and is setting the requirements for remediation of undeveloped

residential-use land at a maximum level of 500 ppm not 1000 ppm. These two standards are in contradiction with one another.

The difference between the two standards (residential versus undeveloped/future residential) appears to be related to availability of funding for cleanup. In other words, there is just enough money available in the ASARCO reclamation fund to implement 2R and nowhere near enough to support 3R. In the case of undeveloped lands, however, since funding will likely be paid out of the developer's pockets, the level for remediation is set at 500 ppm. This reasoning ignores the actual health issues.

The plan that the EPA implements should require a uniform standard regardless of whether it involves developed or undeveloped land. Implementation of the 500 ppm level (i.e. 3R) is the safest plan and would stand the test of time. ASARCO should be required by the EPA to meet this standard (just like private developers will be required). Because of ASARCO'S current shaky financial condition they may not be around to resolve recurring issues in the future. They need to be held accountable now while there is still opportunity!

- **Moriah Bucy – Consider costs based on the lower cleanup level leaving all other aspects the same**

  The two alternatives that require action be taken are completely different and can't be accurately compared. The action alternative that was not selected is based on a yard average, which in itself is completely inappropriate, as lead handbook referred to in the previous comment specifies that yard averages should not be used. Additionally, the costs for this alternative are going to be much higher, as the soil removal will inevitably be much larger given that the entire yard would have to be removed. It would be more useful, and more accurate, to simply change the cleanup level and leave all other aspects of the remedy the same. I expect that this would result in a much lower dollar figure for overall cleanup costs. I would like to see EPA consider what the costs would be for cleanup based on the lower cleanup level from the model (520 ppm) leaving all other aspects of the chosen remedy the same.

- **Lewis & Clark City-County Board of Health – Question regarding yard average versus individual quadrant**

  Page 19, 2nd column, Paragraph 1 (of the Proposed Plan) - Why are yard averages or property averages being used versus the protocol in place which uses individual quadrant analysis? Does EPA propose changing the protocol to yard averages?

- **Montana Department of Environmental Quality – Contingencies**

  The Record of Decision should include a discussion of contingencies if the remedy fails to be protective. Also, it should describe the contingencies if the city or county can't / doesn't want to implement or, if it implements, but at some point can't / doesn't want to continue the institutional controls.

- **Lewis & Clark City-County Board of Health – Regarding community acceptance**

  Page 29, Community Acceptance, Paragraph 2. This paragraph is incorrect. While the BOH does support protection of human health, we do not link human health protection to such

criterion as "at the most reasonable cost." The BOH requests this paragraph be omitted.

- **Montana Department of Environmental Quality – Regarding formal comments from the support agency**

  The NCP, at 40 CFR 300.430(f)(2)(iii), requires at a minimum that the proposed plan provide a summary of any formal comments received from the support agency. The proposed plan did not include that but stated, "After consideration of public and local government concerns and comments, MDEQ will present formal comments to EPA." DEQ would have appreciated its own input into the Proposed Plan.

- **Lewis & Clark City-County Board of Health – Explanation for use of the term "all known measures"**

  Page 26 and 27 (of the Proposed Plan) - The Proposed Plan indicates that Alternatives 2R and 3R are "by all known measures" equally protective. Please explain further. What are "all known measures"?

- **Montana Department of Environmental Quality – Disagrees with statements regarding protectiveness and risk reduction**

  Eliminate the conclusion that the preferred alternative is protective of human health based on blood lead sampling. Also, alter the conclusion that remedy alternatives are equally capable of reducing risks.

- **Montana Department of Environmental Quality – Different goals and objectives for removal actions vs. remedial actions**

  The preferred alternative in the proposed plan involves continuing with cleanup criteria established through the removal actions. The Record of Decision should include a discussion to notify the reader as to the different goals and objectives of a removal action compared to a remedial action. As set forth in the NCP, 55 Fed. Reg. 8695, "Although all removals must be protective of human health and the environment within their defined objectives, removals are distinct from remedial actions in that they may mitigate or stabilize the threat rather than comprehensively addressing all threats at a site."

<u>EPA RESPONSES TO COMMENTS PERTAINING TO SELECTION OF REMEDIAL ALTERNATIVES</u>

Responses in this category are also closely related to those pertaining to cleanup levels and institutional controls. Readers are urged to consult comments and responses within Sections IV, V, and VI, in addition to the responses provided below.

EPA's primary concern is protection of the residents of East Helena, particularly children. This concern expressed itself in the form of an interim action involving removal of lead-impacted soils from yards surrounding East Helena residences and placing the soils in the East Fields repository. This action was undertaken after careful consideration of the National Contingency Plan (NCP) threshold criteria requiring protection of human health and the environment and compliance with ARARs.

The interim action was supported by initiating the East Helena Lead Education and Abatement Program. Strong and active support by local government, their associated agencies, and the citizens of East Helena lead to a successful implementation of this program. Today, children's blood lead concentrations are below or near the national average indicating that the interim action and the Lead Education and Abatement Program have achieved their goals.

EPA agrees with all commenters who support Alternative 2R, for East Helena residential soils, and Alternative 4U, for undeveloped property. EPA agrees that the Lead Education and Abatement Program should be continued and the proposed institutional controls should be adopted. This plan is feasible and will protect the citizens of East Helena.

The selected remedy is comprised of strategies for both existing residential areas and undeveloped lands. As discussed in detail in Section IV, the selected remedy for residential areas, Alternative 2R and its two-part cleanup level of 1,000/500 ppm are uniquely suited to the variability in residential soil lead concentrations. The selected remedy for undeveloped lands is suited to the conditions of low variability in lead concentrations and large open spaces amenable to treatment by tilling, and provides a cost-effective solution to combined sampling/remediation requirements. In the end, as newly-developed residential areas blend into existing residential areas, both will exhibit neighborhood average lead values less than 500 ppm.

Past Removal Actions have addressed areas with soil containing concentrations of COCs above cleanup levels through excavation, backfill, and re-landscaping in residential areas, and treatment or capping/covering for undeveloped lands;

The selected remedy provides future protectiveness through the cleanup of residential yards and undeveloped lands proposed for development, and the application of institutional controls. In addition, the East Helena Lead Education and Abatement Program will continue to operate;

The selected remedy will be protective of human health and the environment, comply with ARARs, and be cost-effective.

The selected remedy provides the best balance of tradeoffs among alternatives for residential and undeveloped lands, and attains an equal or higher level of achievement of the threshold and balancing criteria than other site-wide alternatives that were evaluated. The successful performance of the selected remedy is demonstrated by years of response action removal of residential soils, reclamation performance monitoring at response action sites in the OU, and the success of the Lead Education and Abatement Program.

The selected remedy includes a variety of components that together represent an effective and practical remedial solution for the type of waste and the associated level of risk at OU2. The components of the selected remedy for soils accomplish overall protection of human health and the environment and compliance with ARARs equally as well or better than other alternatives evaluated. Threshold criteria are achieved through residential soil removal; removal, capping, or treatment of undeveloped lands; and the application of institutional controls and monitoring. The selected remedy achieves substantial risk reduction and is feasible, implementable, and cost effective. The selected remedy includes treatment of lead-contaminated soil through the application of lime amendments and tilling when appropriate. The selected remedy effectively eliminates, mitigates, or manages residual risk and provides for long-term protection through residential contamination abatement, management and remediation of undeveloped lands, appropriate institutional controls, and continuous evaluation and performance monitoring of the remedy.

The selected remedy is compatible with land reuse and redevelopment within East Helena and Lewis and Clark County. EPA and the State will continue to work cooperatively with the local county government and Asarco to ensure redevelopment is protective of human health and the environment.

Cleanup alternatives for residential areas were originally developed in the 1990/1991 remedial investigation and feasibility study reports, and a 1991 engineering evaluation and cost analysis report. The alternatives evaluated in detail in the original site feasibility studies included no action, institutional controls (remedy protection measures), capping (covers), excavation, treatment, and disposal options. Some of the alternatives developed at that time, however, are no longer considered viable; due principally to the substantial amount of cleanup that has since occurred. In addition, the results of feasibility and treatability studies conducted during the removal actions have eliminated some alternatives. For example, the original feasibility study considered disposal of excavated residential soils in a RCRA facility, as well as disposal in East Fields. Treatment of the East Fields, and placement of excavated residential soils at East Fields have since been shown to be effective. Therefore, alternatives that incorporate many of the features of the original alternatives, but are relevant for current conditions, have been evaluated. Capping and in-place treatment were not alternatives presented in the Proposed Plan for residential cleanup because it has been EPA's experience that these options were not feasible for remediation of residential yards. Two removal alternatives were considered and presented rather than alternatives that are not applicable for residential yards. There are no "new" alternatives – all of the alternatives were included in the original feasibility studies. It is also noted that the final RI/FS guidance was published in 1988 and hasn't been updated since; therefore the 1991 RI/FS was prepared in accordance with current guidance. In addition, the removal actions are conducted in accordance with the guidance issued by EPA in 1993, Conducting Non-Time Critical Removal Actions under CERCLA (OSWER Directive 9360.0-32), and the selected remedy is consistent with the non-time critical removal actions.

The Proposed Plan is supported by information in the Administrative Record. Correspondence and reports subsequent to the 1991 RI/FS are available in the Administrative Record. Although some regulations may have been modified since 1991, and new regulations may have come into effect, the remedy is a risk-based cleanup, not an ARAR-based cleanup. Therefore, any slight changes to the ARARs since 1991 are not anticipated to affect the cleanup and the ARARs currently identified in the Administrative Record were considered sufficient to support the selection of the remedy. The Superfund Lead-Contaminated Residential Sites Handbook (EPA 2003) also points out that the Toxic Substances Control Act (TSCA) § 403 Soil Hazard Rule, which establishes a soil-lead hazard of 400 ppm for bare soil in play areas and 1,200 ppm for bare soil in non-play areas of the yard, should not be treated as an ARAR to modify approaches to addressing NPL sites. The Record of Decision will identify the ARARs for the site

- *EPA has in the past sought funding from viable Potentially Responsible Parties for implementation and administration of ICs. However, the status of ASARCO's bankruptcy remains unknown, therefore EPA must consider the possibility East Helena will become a Fund-lead site. If that becomes the case, EPA can only seek funding from national sources, year-to-year with no absolute assurance that funding will be provided. Further, if it were to become a Fund-lead site, the State of Montana has some obligation to either match or fund long-term IC administration during operation and maintenance. Funding mechanisms are typically not described in a Proposed Plan.*

- *A value of 500 ppm has been selected as the action level for undeveloped properties to account for the differences between the methods that were used to sample undeveloped property soils and residential property soils, and to overcome uncertainty that arises from fewer samples per unit area.*

- *Funding by ASARCO was not considered during selection of the cleanup levels. See EPA Response in Category IV, Lead Cleanup Action Levels, for a detailed explanation regarding the standards for residential properties and undeveloped land.*

- *EPA provided the alternatives for consideration in the Proposed Plan coordinated with the cleanups and lessons learned over the past 15 years. The alternative selected is patterned after the residential soil removal actions that have been in place and utilized since 1991, which have been updated as appropriate (see sampling and analysis), and which EPA believes have proven safe, effective, and protective of human health. Additionally, the national EPA regulatory goals for lead of 400 ppm (by weight) in bare soil in play areas, and 1200 ppm for bare soil non-play areas, was established under TSCA in 2001 (see EPA 40 CFR Part 745 Lead; Identification of Dangerous Levels of Lead; Final Rule, January 5, 2001). Generally, a comparison of the established East Helena cleanup levels with EPA final standards, released 10 years later, illustrate that these site specific processes and cleanups are credible and should continue to be supported.*

- *EPA is required to summarize in a proposed plan other cleanup alternatives that were examined during the feasibility study. Alternative 3R was examined, but rejected because a cleanup level of 500-ppm lead, overall, is deemed unnecessary (Alternative 2R is protective) and the cost of Alternative 3R would be many times greater than the cost of Alternative 2R. Alternative 2R is still the EPA's preferred remedial alternative, as EPA considers its cleanup action levels (1,000/500 ppm lead) to be protective. Future cleanup activities are not warranted.*

- *While some RODs may contain contingent remedies, those are restricted for unique cases where there is a reasonable doubt as to the implementability of the primary remedy. In the case of East Helena, the remedies identified in the ROD are readily implementable, and therefore, contingent remedies are not identified. In addition, the site will be subject to Five-Year Reviews, and if an element of the remedy is not protective (this is not expected), then that part of the remedy can be reconsidered and changed, if necessary.*

- *EPA is required to include cost considerations as part of the regulatory remedial selection process and evaluation of preferred cleanup alternatives. Extensive investigation, evaluation, and documentation provided in the administrative record support the recommended alternatives, in addition to the consideration given to costs.*

- *The State's acceptance of, or perspective on, the Selected Remedy is one of the nine evaluation criteria discussed in the ROD. In addition, responses to formal comments, including the State's, are included in the ROD. The ROD is also required to identify significant changes, if any, to the Remedy between the time of publication of the Proposed Plan and the ROD, as a result of comments or for other reasons.*

- *The reference to "by all known measures" simply means an evaluation of the level of protectiveness for the two alternatives. The soil cleanup lead levels for each remedial alternative are both at levels for which no measurable effect on blood lead levels is observed*

for a residential setting. The blood lead data do not support differing levels of protectiveness for the cleanup levels associated with these alternatives. They are therefore both considered to be equal in terms of protectiveness of human health and the environment and reducing risks. The key difference in reducing the cleanup levels between Alternative 2R and 3R is a significant cost increase.

- *With respect to removal and remedial actions, the quotation from NCP, 55 Fed. Reg. 8695 states, "Although all removals must be protective of human health and the environment within their defined objectives, removals are distinct from remedial actions in that they may mitigate or stabilize the threat rather than comprehensively addressing all threats at a site" indicates that the removal action may mitigate or stabilize the threat. It doesn't mean that any given Removal Action at a specific site has not comprehensively addressed all threats at a site. In the case of East Helena, it is EPA's perspective and conclusion that the previously conducted Removal Actions have comprehensively addressed the risk posed by the sites on which Removal Actions were conducted. Similarly, the EPA believes that the Preferred Alternative in the Proposed Plan (selected remedy in this ROD) also comprehensively addresses the risk posed by the site. The ROD discusses and clarifies that this is the case.*

IX. INTERIOR DUST

COMMENTS

- **Lewis & Clark City-County Board of Health – The Preferred Cleanup Alternative should address attic dust and other potential pathways for metal exposure**

  The Preferred Cleanup Alternative should address the following:

  - Attic Dust. To prevent sub-chronic, acute exposures to high concentrations of metals that may be present in the attic dust of homes in East Helena, the Preferred Cleanup Alternative should include measures to prevent such exposures. Acute exposures to attic dust have been reported in other smelter areas (Montana Standard, 2004). In addition, the Record of Decision (ROD) for the Butte Priority Soils Operable Unit of the Silver Bow Butte Area Superfund Site includes measures to mitigate attic and other household dust traps that may have accumulated substantial metal and metalloid concentrations during operational years of the smelter.

  - Other potential pathways for metal exposure - for example contaminated soil in earthen walled basements or crawl spaces, and dust in heating and venting ducts.

- **Montana Department of Environmental Quality – Include interior dust in the remedy**

  Include interior dust removal in the remedy.

- **Montana Department of Environmental Quality – Selected remedy should require removal of dust if there is a complete or partially complete exposure pathway**

  DEQ supports the Lead Program's environmental assessment approach to assess possible sources of lead exposure routes within a home and then provide education on how to reduce exposure. However, the selected remedy should proactively reduce unacceptable exposure,

including unacceptable exposure to interior dust, and require removal of dust if there is a complete or potentially complete exposure pathway.

EPA RESPONSE TO COMMENTS PERTAINING TO INTERIOR DUST

Several commenters expressed concern for health effects that may be associated with exposure to attic dust. The Preferred Cleanup Alternative, however, includes institutional controls (ICs) as a measure to prevent or minimize exposures to all known sources of interior, household dust. The Selected Remedy will, "Establish institutional controls that will enable the Lewis and Clark City-County Board of Health and City of East Helena to adopt and enforce regulations needed to . . . [among other needs] (b) prevent exposures to interior household dust during remodeling or demolition of attics, unfinished basements, heating ducts or exterior walls and windows."

Active remediation of household dust does not appear to be warranted at East Helena because of an incomplete exposure pathway, except in some instances during remodeling or demolition. This is a situation similar to the Butte Priority Soils Operable Unit (BPSOU), for which the Record of Decision states, "In most homes, there is not a complete attic dust exposure pathway because attics are not living spaces and are infrequently accessed by Butte and Walkerville residents."

In addition, the Superfund Lead-Contaminated Residential Sites Handbook (EPA 2003) states, "Areas such as attics, crawl spaces, and other non-living spaces need not be addressed unless they are shown to be a continued source of contamination to the living areas . . . ." Because of the multi-source aspects of interior dust contamination, potential for recontamination, and the need for a continuing effort to manage interior dust exposure, OSWER recommends the use of an aggressive health education program to address interior dust exposure."

Nevertheless, the ROD provides for the selected remedy to include active efforts to clean up interior dust sources or pathways. If, in administering ICs, county health professionals determine that interior dust, such as attic dust or any other source of interior dust, presents unacceptable exposure in their judgment, then action is both warranted and required. EPA has considered this possibility, albeit it is unlikely to be administered except under extraordinary circumstances, and will seek funding as in the case of administration of all other ICs.

X. LEAD EDUCATION AND ABATEMENT PROGRAM

COMMENTS

- **Montana Department of Public Health and Human Services - Continue the existing Lead Education and Abatement Program**

  Continue the existing East Helena Lead Education and Abatement Program

- **Jeri Dwan – "The program is not all that well known or advertised"**

  It seems to me that the Proposed Plan places a lot of emphasis on the East Helena Lead Abatement Program to continue to provide information to the public about the risks of lead and ways to prevent exposure to lead, particularly since the cleanup level is higher than that recommended by the state agency, DEQ. I also understand that this program is the one that

conducts the blood screenings to make sure our children have not been exposed to unsafe levels of lead. The problem with this scenario is that this program is not all that well known or advertised. I feel that I can say this with certainty because I have lived in this community for nearly five years and have only seen one postcard having anything to do with the Lead Abatement Program. The troubling part is that I have a four year old son who plays outside in our yard on an almost daily basis and another baby on the way. From what I have been told, my particular neighborhood may be a lesser concern than others, as it is farther away from the source. However, as I mentioned before, I have not received any real information about risks to my children, nor have I been made aware that such information was available. I consider myself to be a well educated and concerned parent and worry that if I was not aware of the risks available information sources, there must be a lot of other parents in the community who have no idea about this issue either.

EPA RESPONSES TO COMMENTS PERTAINING TO THE LEAD EDUCATION AND ABATEMENT PROGRAM

EPA considers the continuation of the Lead Education and Abatement Program of great importance as well. East Helena residents have expressed how important the program is to their feeling of well-being. Local health professionals are best suited and most qualified to continue to educate the community and to work with the community to develop and administer sensible, effective institutional controls that are neither too invasive nor onerous. This has been a clearly expressed desire of the majority of East Helena residents.

Continuing education is highly desirable to parents and educators in this community. The Lead Education and Abatement Program should continue for that reason, but the program also should continue for the reason that, regardless of the cleanup action level, institutional controls will be necessary in the community and the program is best suited and qualified to administer institutional controls both now and in the future.

Recently, the State Medical Officer for the State of Montana Department of Public Health and Human Services supported EPA's cleanup recommendations in a letter to EPA on April 16, 2007. The State Medical Officer supports continuation of the existing East Helena Lead Education and Abatement Program and establishment of institutional controls to prevent disturbances of contaminated soil and prevent human expose on renovation / demolition of existing houses in East Helena.

The program staff strives to reach all families in the community; however, it appears that some families may have not have been sufficiently informed. EPA has passed this information on to the County. The office is located at 2 South Morton in East Helena and the phone number is (406) 227-8451. Residents can visit the office, or call for an in-home consultation that will be provided at no cost to the resident.

Community Involvement

Currently, ASARCO is funding a county-administered health education and abatement program using health professionals stationed within the community and its schools. The community is advised by health professionals, school administrators, and teachers. The vast majority of East Helena's children are tested at least once during early childhood. Many children are tested repeatedly, although not because they have elevated blood lead levels.

The East Helena Lead Education and Abatement Program manages and implements a successful

and comprehensive education program for residents within the East Helena areas affected by lead. The program is limited to notification of residents located within local zip code 59635. This zip code primarily covers all the areas of affected residents of the past operations of the ASARCO smelter. The lead education and abatement program provides substantial documentation to residents in many forms, including:

- *Publishing and distributing a quarterly newsletter that talks about the cleanup activities going on in East Helena project areas*
- *Distributing the newsletter to about 3,400 people each quarter*
- *Providing "New Baby" packets, which are sent out six times per year to mothers and/or parents to raise awareness of lead issues. Overall, 300 to 400 packets have been distributed in the last five years*
- *Personnel trained in lead education routinely visit day care centers and schools*
- *At schools, lead education and abatement materials are given out and sent home with students.*
- *Conducting monthly meetings for public input*

Additionally, numerous documents can be referenced online and by visiting the local offices of the EPA, MDEQ, and Lewis & Clark City-County Board of Health. Contact details are provided in the Proposed Plan and additional publicly available resources.

EPA Records Center, 10 West 15th Street, Suite 3200, Helena, Montana.
Montana Office of EPA at (406) 457-5000.
www.epa.gov/region8/superfund/mt/east_helena/index.html

Program Effectiveness

In spring 1999, EPA, ATSDR, the county, MDEQ, and ASARCO reviewed the program's effectiveness using door to door surveys and other evaluation methods. A final report is available from the county health department. The program received high grades for its performance.

Since the program's inception in 1995, 1,060 individual blood lead tests have been conducted for children in East Helena under the age of 7 years. About 1% of the children tested during this period exhibited blood lead values greater than 10 ug/dl. Since 1999, there has been a significant decrease in the numbers of children above the detection limit of 1 ug/dl lead in blood. Since 2001, 95% of children tested were at 4 ug/dl or below and only two children, of 704 children tested, had a blood lead value above 10 ug/dl. Both of these children had blood lead levels of 12 ug/dl. The blood lead level of one of these children was attributable to lead-based paint through an environmental assessment. The cause of the blood lead level of the other child could not be determined because the parent did not allow an environmental assessment. The average of blood lead levels in East Helena and the surrounding community have been 2 ug/dl or less for the last five years, and have been approximately at or less than the national average since 2005. Yet, prior to 1985, two-thirds of East Helena's children exhibited blood lead ratios greater than 10 micrograms per deciliter and one-third exhibited ratios greater than 15 micrograms per deciliter.

East Helena parents have made it clear they desire a continuation of blood lead testing. They recognize that the predictive model provides for no measure of success or attainment of goals. Most parents in this community consider their efforts and those of EPA, the county

administered lead education and abatement program, and Asarco to be a success that may be unparalleled, anywhere. Continued testing eliminates the need for guessing or uncertainty.

XI. SOIL SAMPLING AND ANALYSIS

COMMENTS

- **Lewis & Clark City-County Board of Health – "The BOH requests that a detailed Standard Operating Procedure (SOP) be provided"**

  The soil sampling and analysis approach is not described in the Proposed Plan for either residential yards or undeveloped land. A Modification of the Administrative Order on Consent for the East Helena Residential Soils Removal Action 1992) indicates that 5 sampling points are used within each removal unit (i.e., residential yard quadrant). Soil is removed to the depth needed to reduce the remaining lead concentration to below 440 ppm and the arsenic concentration to below 100 ppm. The BOH requests that a detailed Standard Operating Procedure (SOP) be provided describing the soil sampling and analytical approach, including the justification for determining the depth to which soils are excavated in residential yards.

  The analytical method is not described in the Modification, but we understand that field portable X-Ray Fluorescence (XRF) analyzers are used to determine arsenic concentrations. Because XRF technology is a field screening approach and is not considered as accurate as laboratory analyses (i.e., EPA Method 600017000 Series using EPA SW-846 protocols for Quality Control requirements [QA/QC]), the BOH recommends that a Quality Assurance Project Plan (QAPP) be implemented to validate the accuracy and precision of the field screening data (at least to a limited extent).

- **Lewis & Clark City-County Board of Health – "It is the opinion that the lead cleanup level should be based on the fine soil fraction"**

  In addition, it is the opinion that the lead cleanup level should be based on the lead concentration in the fine soil fraction. EPA guidance for sampling and analysis of soil at lead sites (USEPA, 2000) indicates that the concentration of lead from the fine fraction of soil (< 250 microns) is relevant for exposure from incidental soil ingestion and should be used over bulk soil analysis. The fine soil fraction is the particle size soil fraction expected to stick to fingers and, thus, become incidentally ingested. In addition, the fine soil fraction is the most likely fraction to accumulate in indoor environments as dust. The Technical Review Workgroup for metals and asbestos (TRW) reviewed data from several Superfund sites and demonstrated that the concentration of lead in the fine soil fraction differs from the concentration in the bulk soil with an enrichment of lead and other metal contaminants observed in the fine soil fraction.

  The EPA lead models consider the fine soil fraction to be the primary source of the ingested soil and dust. Fine soil fraction lead concentrations are the recommended input for both the IEUBK and the Adult Lead Model (USEPA, 2000). A site-specific lead enrichment equation can be developed to relate lead concentrations in the bulk soil and fine fraction (USEPA, 2000).

EPA RESPONSES TO COMMENTS PERTAINING TO SOIL SAMPLING AND ANALYSIS

- *Development of Standard Operating Procedures (SOPs) is outside the scope and detail of the Proposed Plan. However, the subsequent remedial design process requires detailed Work Plans and Sampling and Analysis Plans. EPA considers it prudent to revisit all aspects of the Sampling and Analysis Plan during the remedial design process, including review, updates, and modifications to existing protocols and procedures, if warranted. However, EPA has used a conservative sampling approach to date, as described below.*

  EPA collected soil samples utilizing a protocol for residential yards that produced "biased" results. That is, early in the cleanup process, sampling methods were improved and modified in order to locate the highest lead concentrations of each yard. Depressions and drip lines that collect runoff; play areas that lacked a protective grass barrier; undisturbed areas around the property's periphery; parking areas for trucks and equipment; worn paths from shops or garages; areas showing signs of fallen chipped paint; junk storage areas (batteries, oil, hobbies, etc.); and kennels and pet runways were all areas that sampling teams were required to seek out and collect soil for analysis.

  Analytical results for lead were adjusted to ensure that a statistically-derived upper 95th percentile confidence limit was achieved. That is, every soil sample analyzed for lead was reported first as a raw value and second as the UCL 95% value. The adjusted lead values were used to determine whether or not a yard qualifies for cleanup. Biased sampling and the UCL 95% adjustment, together, resulted in a significantly more conservative outcome than is "required" by EPA's national guidance. To illustrate, the following actual examples are presented:

  1. The residential yard with site code HC05 was sampled in 1991 without biasing the collection of samples and without the UCL 95% adjustment. The analytical results for lead (in parts per million) were Q1 = 658, Q2 = 588, Q3 = 813, Q4 = 685. It did not qualify for cleanup. In 1994, this yard, and an additional 180 other residential yards, were resampled using the biased approach and the UCL 95% adjustment. The analytical results for this same property in 1994, using the biased approach and the UCL 95% adjustment, were Q1 = 1069, Q2 = 957, Q3 = 684,and Q4 = 1033 (ppm lead). This property was cleaned up and all 4 quadrants qualified for cleanup based on the 1,000/500 ppm criteria.

  2. Another residential property (Site Code TK03) was sampled in 1991without biased sampling and without the UCL 95% adjustment. The analytical results for lead (ppm) were Q1 = 336, Q2 = 497, Q3 = 263, Q4 = 338. It did not qualify for cleanup. This yard was resampled in 1994 using the biased approach, which resulted in dividing the yard into 7 sections rather than 4, and the UCL 95% adjustment. The analytical results for this property in 1994 were Sec 1 = 1370, Sec 2 = 747, Sec 3 = 429, Sec 4 = 369, Sec 5 = 872, Sec 6 = 742, and Sec 7 = 510 (ppm lead). This property was cleaned up and 5 of the 7 sections qualified for cleanup.

  These are not isolated examples. Following modification of the sampling and analysis plan in 1994, approximately 60% of the resampled yards were found to qualify for cleanup.

- *The Spectrase 5000 XRF spectrometer has been utilized to accurately and effectively implement the East Helena residential soil cleanup in a timely and cost effective manner. EPA will continue to utilize this tool, or a similar tool, together with the requisite number of cross-checks and data validation procedures (see XRF Technologies for Measuring Trace*

Elements in Soil and Sediment, Innovative Technology Verification Report, EPA/540/R-06/002, February 2006).

XII. COMMERCIAL AND RECREATIONAL RISK-BASED CLEANUP LEVELS

COMMENTS

- **Lewis & Clark City-County Board of Health – "Please provide information regarding how Burlington Northern and Montana Rail Link will be in the railroad right-of-way cleanup"**

  Page 1, 2nd column, last bullet (of the Proposed Plan) - Please provide information regarding how Burlington Northern and Montana Rail Link will be in the railroad right-of-way cleanup.

- **Lewis & Clark City-County Board of Health – "The Preferred Cleanup Alternative should include measures to prevent sub-chronic, acute exposures"**

  Page 21, 2nd column, Paragraph 1 (of the Proposed Plan) - this states "...it is simply not practical to eliminate all sources of and pathways for lead exposure from this large site (the rodeo grounds)." EPA provides no substantiation for this conclusion.

  The soils of the rodeo grounds contain very high concentrations of lead and arsenic. To prevent sub-chronic, acute exposures largely due to fugitive dust emissions, the Preferred Cleanup Alternative should include measures to prevent such exposures.

- **Montana Department of Environmental Quality – The ROD should require cleanup of portions of the rodeo grounds**

  The Record of Decision should require cleanup of the portions of the rodeo grounds with soil levels above the recreational cleanup level of 2,800 ppm lead and 1,000 ppm arsenic.

- **Lewis & Clark City-County Board of Health – Include measures to address upstream contaminant sources to prevent recontamination of creek sediments**

  Prickly Pear Creek Upstream Contaminant Sources - The Proposed Plan should include measures to assure that upstream contaminant sources, such as slag piles, ore storage areas, and the process ponds, are adequately contained or removed to prevent re-contamination of the Creek sediments during major storm and flooding events.

- **Montana Department of Environmental Quality – Provide the supporting basis used to determine the cleanup levels for commercial and recreational use**

  Please provide the assumptions, risk calculations, and risk management basis used to determine the newly proposed soil cleanup levels for commercial and recreational land use. DEQ requests copies of this documentation for review and comment as soon as possible. Also, the Record of Decision should make clear that the soil cleanup levels for commercial and recreational land use apply to the entire operable unit and not just undeveloped lands.

- **Lewis & Clark City-County Board of Health – Please provide the reference for recent calculations establishing RBCs for workers and recreationists**

Page 16, 1st column, last paragraph (of the Proposed Plan) - Please provide the reference for the recent calculations establishing risk-based concentrations of lead and arsenic in soils for undeveloped lands for workers and recreationists.

EPA RESPONSES TO COMMENTS PERTAINING TO COMMERCIAL AND RECREATIONAL RISK-BASED CLEANUP LEVELS

- *EPA has identified both Burlington Northern and Montana Rail Link as Potentially Responsible Parties (PRPs) and both companies are aware that EPA considers them as PRPs. These PRPs, as well as the principal PRP, Asarco, either collectively or individually will be given opportunities to enter into a negotiated consent decree for performance of Remedial Design (RD)/Remedial Action (RA), after the ROD for East Helena is issued. Cleanup of the railroad right-of-way is part of the selected remedy.*

- *Although the rodeo grounds were originally part of OU2 they are now being addressed under the 1998 RCRA Decree, and are therefore not part of OU2.*

- *Contaminant transport from the smelter, during historic floods, occurred primarily because fine, powdery concentrates were stored in piles outdoors until 1988-1989. Floods, such as in 1964 and 1980-1981, as well as numerous other floods that occurred during the first half of the 20th Century, are known to have carried fine concentrates in suspension and deposited them across a broad flood plain downstream. Evidence of these events exists to this day in the formerly irrigated fields north of town and all the way downstream to Lake Helena. However, in 1988-1989, Asarco constructed a large ores and concentrates storage and handling building, which eliminated outdoor storage of raw materials. Shortly after, Asarco also constructed a smelter runoff collection and flood routing system. These were cooperative efforts involving Asarco, MDEQ (then MDHES) and EPA, and they eliminated any further potential for flooding or transport of contamination. Existing residential neighborhoods that were impacted by flooding and contaminant transport were among the first yards, parks, playgrounds, street aprons and alleys to be cleaned up ("yellow zone," 1992-1996). Furthermore,the selected remedy requires completion of a cleanup involving the former irrigation ditches and channels north of town. Approximately 60% of the impacted ditches and channels were cleaned up before the smelter discontinued operations in 2001. All remaining impacted ditches and channels have been characterized and will be cleaned up in 2009 or 2010.*

- *The PRGs referred to in the Proposed Plan for exposure of workers and recreational visitors to lead and arsenic were based on initial calculations that have subsequently been revised to be fully consistent with revised EPA guidance and with PRG calculations for residential exposures. These revised PRGs are described in an EPA technical memorandum dated July 30, 2007. The revised PRGs are as follows:1482 ppm lead for workers, 3245 ppm lead for recreationists, 572 ppm arsenic for workers, and 794 ppm arsenic for recreationists. The revised PRGs (also referred to as risk-based concentrations) are fully explained and incorporated in the Record of Decision.*

XIII. RISK-BASED CLEANUP ACTION LEVEL FOR SOIL ARSENIC

COMMENTS

- **Lewis & Clark City-County Board of Health – Include cleanup alternatives for arsenic**

  The Proposed Plan does not present cleanup alternatives specific to arsenic. Rather, it indicates that because arsenic is with lead, it should be mitigated through the remedy directed at lead in soils. It is the opinion of the BOH that the Preferred Cleanup Alternative should be revised to ensure the arsenic cleanup level is attained. For example, Alternative 2R should be revised as follows: Selected Soil Removal (lead cleanup level [ppm] and arsenic cleanup level [ppm], Continuing Community Education, and Institutional Controls.

- **Montana Department of Environmental Quality – "The remedy should require that residential soils with arsenic greater than the action level should qualify a yard for cleanup"**

  The remedy should require that residential soils with arsenic greater than the action level should qualify a yard for cleanup.

- **Lewis & Clark City-County Board of Health – Recalculate the arsenic preliminary remediation goal**

  The BOH does not agree that the arsenic Preliminary Remediation Goal (PRG) of 176 parts per million (ppm) is health protective. The PRG was calculated using a target risk of 1.499E-04, which exceeds EPA's acceptable risk range of 1E-06 to 1E-04 (i.e., one in one million to one in ten thousand) (USEPA, 1991) and MDEQ's acceptable risk range of 1E-05 to 1E-06 (i.e., one in one hundred thousand to one in one million). Although EPA guidance indicates that when risks are being estimated they should be considered accurate to one significant figure the BOH does not believe it appropriate to intentionally select the largest target risk that may mathematically be rounded down to 1.0E-04. In addition, EPA indicates a preference for remedies that will achieve the more protective end of the range (i.e., 1.0E-06). Therefore, the arsenic PRG should be recalculated using a target risk within both EPA's and MDEQ's acceptable risk ranges, as well as considering appropriate background concentrations. The BOH acknowledges that background concentrations in Montana may exceed 1.0E-05 (MDEQ, 2005) and must, therefore, be considered in the development of the site-specific PRG for arsenic in East Helena.

  The recalculation of the arsenic PRG should include the contribution from the dermal exposure pathway that was previously omitted (ISSI, 1999). Considering a site-specific relative bioavailability (RBA) for arsenic is not available, the RBA should be conservatively estimated in the 80 to 100% range (as was used in the 1989 [Hunter Services] and 1995 [Kleinfelder] risk assessments), rather than the estimate of 50% used to calculated the arsenic PRG (ISSI, 1999, 2001).

  Cleanup levels selected for arsenic in soils at other mining and mineral processing sites also suggest the East Helena PRG is not protective. For example, 70 ppm of arsenic or greater in soils is the threshold selected by EPA for residential yard removal and replacement at the Vasquez Boulevard & 1-70 superfund site in Denver. Arsenic

cleanup levels for residential soils are all 100 ppm or less for the ASARO/El Paso Smelter site, Coeur d' Alene basin, Jacobs Smelter in Utah, Smelter in Utah, Sharon Steel in Utah, and ASARCO/Globe Site in Colorado. Closer to home, Montana DEQ has established a "generic" 40 ppm action level for arsenic in soil that is based on carcinogenic and non-cancer risk analysis (MDEQ 2005).

It is also worth referring to the 1991 Remedial Investigation/Feasibility Study (RI/FS) which presumably provides the basis for the Proposed Plan. This document assessed concentrations of a number of metals and metalloids in residential soils, and used a risk-based modeling approach to develop remedial goals. The target concentration identified in the RI/FS for arsenic is 45 ppm, approximately ¼ the PRG noted in the Proposed Plan (Hydrometrics 1991; see Table 1 0-6-I).

It is the opinion of the BOH that the arsenic contamination remaining in soils may well be a "source of concern" to the community in that cancer probability from exposure to these soils may exceed EPA's range of acceptable risk. It should be noted that EPA's Proposed Plan seems to acknowledge this possibility, in stating: "As arsenic concentrations in soil rise above that value, however, long term exposures (timeline) present risks that may be unacceptable." (page 32).

The development of the arsenic PRG should also allow for the uncertainty associated with the toxicity of arsenic, a known human carcinogen. For example, the California Environmental Protection Agency considers arsenic more toxic than EPA and has adopted a cancer slope factor for arsenic that is 9 times greater than the arsenic cancer slope factor available from EPA (USEPA, 2004a).

- **Montana Department of Environmental Quality – The Record of Decision should list the arsenic Preliminary Remediation Goal of 117 ppm**

  The calculated cancer risk of 1.499E-04 exceeds EPA's "acceptable" risk level of 1.0E-04, as well as DEQ's "acceptable" risk of 1.0E-05. The correct application using 1.0E-04 in the calculation gives an arsenic PRG of 117 ppm. The Record of Decision should list the arsenic PRG of 117 ppm.

- **Lewis & Clark City-County Board of Health – It is erroneous to equate average arsenic levels below 80 ppm to "near natural levels"**

  We would also note that it is erroneous to equate average arsenic levels below 80 ppm to "near natural levels." According to EPA's supporting documentation for East Helena, the background arsenic levels used for comparison range from 15 to 18 ppm, with an average of 16.5 ppm. (Hydrometrics 1991, Table 5-1-1).

<u>EPA RESPONSES TO COMMENTS PERTAINING TO DEVELOPMENT OF ARSENIC RISK BASED CONCENTRATIONS</u>

- *The Proposed Plan presents a summary of how risks from exposure to arsenic were evaluated, explains EPA's rationale for conducting a supplemental arsenic risk evaluation from 1999 to 2001, and outlines the development of cleanup alternatives. The supplemental arsenic risk evaluation resulted in a site-specific, risk-based remediation goal for arsenic in residential settings of 176 mg/kg (ppm). A follow-on comparison was conducted to see if*

there were any individual residential yards or lots that might have arsenic greater than 176 ppm, where lead did not exceed 1,000 ppm. None was found. Moreover, as additional sampling has been conducted each and every year since 2001, this relationship has held together without exception. In addition, only six properties were identified where the average arsenic concentration exceeded 176 ppm. However, after implementation of the lead-based cleanup, all six of these properties will be cleaned up and no property will exceed an average value of 176 ppm.

Additionally, all soils requiring sampling in the future—residential, commercial, recreational and industrial alike—will continue to undergo analysis for lead, arsenic, and cadmium.

- *Although the reevaluation resulted in an RBC of 176 ppm, EPA has selected in this ROD a lower cleanup action level for arsenic in residential soil (100 ppm), which is the concentration of arsenic that is readily and cost-effectively attained in combination with the selected cleanup action level for lead in residential soil (1,000/500 ppm) and the risk associated with both the RBC of 176 ppm and the selected action level of 100 ppm are within EPA's generally accepted risk range of 1 x10-4 to 1x10-6.).*

- *As mentioned previously, this ROD includes Remedial Action Objectives and cleanup levels for arsenic that are not dependent on the soil lead concentration. Alternatives other than soil removal for remediation of arsenic were not identified because arsenic will be mitigated when lead is removed. For further detail, please see the supplemental response to questions at the end of this responsiveness summary.*

- *The National Contingency Plan for the Superfund program defines EPA's acceptable risk range for known or suspected carcinogens as 10^{-6} to 10^{-4}, not 1.0×10^{-6} to 1.0×10^{-4} (NCP, 1990). The proposed cleanup level for arsenic is within the acceptable risk range as defined by the NCP. The choice of a target risk of 1.499E-04 is intended to avoid the occurrence of what would be considered to be an internal inconsistency. If the target risk used to derive a PRG is based on a target risk of 1.00E-04, this implies that EPA will take action at all locations that exceed the preliminary remediation goal (PRG). However, all properties whose concentration is above the PRG but below 1.499 times the PRG will have a computed risk of 1E-04, which is judged to be acceptable. In that scenario, action would be taken on properties determined to have an acceptable level of risk, thus the inconsistency.*

  The dermal pathway has not been included in the calculation because dermal absorption of metals from soil is generally considered to be minor. For example, if an individual experiences dermal exposure to outdoor soil over about 30% of their body for 100 days per year (this is considered to be quite unlikely for a resident), the absorbed dose is less than 10% of the orally absorbed dose. Studies by Lowney (2005) have shown that while 2-6% of soluble arsenic acid is absorbed percutaneously, Colorado and New York soils containing arsenic (both wet and dry) exhibited negligible dermal absorption of arsenic. EPA agrees this is a source of uncertainty, but considers the likely magnitude of the underestimation to be small.

  The relative bioavailability (RBA) value that was used to derive the PRG is based on measured values in soil at a number of other mining and smelting sites, where most values are observed to range from 10% to 30%. Based on bioavailability studies conducted by Roberts et al (2006) in cynamologus monkeys and USEPA (2005) in immature swine, the evidence strongly supports reduced bioavailability of arsenic from soil. In Roberts et al (2006) arsenic bioavailability was measured for 14 soil samples from 12 different sites,

including mining and smelting sites, pesticide facilities, cattle dip vat soil, and chemical plant soil. The RBAs ranged from 5% to 31%. In USEPA (2005) 26 test materials from mining and smelting sites were investigated with RBAs ranging from 10% to 60%. Thus, a choice of 50% is judged to be more realistic than a value of 80% to 100%, but still protective of human health.

The observation that other sites have selected PRGs that are different from East Helena is not surprising, because the factors that go into the derivation of the PRG and the risk management strategy vary from site to site. Residential cleanup levels for arsenic in soil range from 70 – 250 ppm in Region 8. The 176 ppm proposed for East Helena is site-specific, is risk-based and is within that range.

While EPA agrees that there is uncertainty in the calculation of the PRG for arsenic, EPA does not believe that the approach employed by California is necessary to protect public health. Rather, EPA believes that there is sufficient conservatism inherent in the exposure factors and toxicity factors that the PRG derived for this site will be protective despite the uncertainties.

- *The comment by the Board of Health, regarding arsenic background concentrations, appears to have confused two different concepts that are discussed consecutively in the Proposed Plan text. The first states, "It is noteworthy that all of the remaining 100 to 110 yards and nine vacant lots that are known to qualify for a cleanup (based upon their lead levels) have an average arsenic concentration well below 176 ppm. The majority of them are below 80 ppm." The second states, "Due to the cleanup already conducted, the community-wide average arsenic-in-soil concentration is now near natural levels." The first concept addresses arsenic-in-soil concentrations for residential yards that have not been remediated. The second concept refers to the fact that the average arsenic-in-soil of any given neighborhood, as well as the community-wide average, already approaches natural levels (i.e., approximately 40 mg/kg) and will be further reduced once the cleanup has been completed. The expression "near natural levels" was not being defined as an arsenic soil concentration of 80 ppm.*

XIV. EXTENT OF CONTAMINATION

COMMENTS

- **Laura and Brian Vachowski - The plan suggests EPA has no knowledge of the extent of contamination on undeveloped property**

  The plan suggests EPA has no knowledge of the actual extent of contamination on undeveloped property. We therefore question the accuracy of the boundary map provided in the plan. Moreover, it is premature to be proposing a final plan for a Superfund site if, in fact, the EPA does not even know the extent of the contamination because, for instance, if that is indeed the case, the cost estimates used for alternative comparisons cannot possibly be accurate.

- **Lewis & Clark City-County Board of Health – "Provide a figure depicting the extent of arsenic contamination in East Helena"**

Page 5 (of the Proposed Plan) - Please provide a figure depicting the extent of arsenic contamination in East Helena (similar to Figure 1 that depicts the extent of lead contamination).

- **Lewis & Clark City-County Board of Health Revise Figure 1 – Provide a map showing the East Helena City Boundary, lands owned by ASARCO, the railroads, and other major landowners.**

  Page 5, Figure 1 (of the Proposed Plan) - Please provide a map showing the East Helena City Boundary, lands owned by ASARCO, the railroads and other major landowners.

EPA RESPONSES TO COMMENTS PERTAINING TO EXTENT OF CONTAMINATION

- *Regarding the figure showing the extent of lead contamination, the lead isoline depicting the outermost extent of properties likely to exhibit a single value exceeding 1,000 ppm lead (red isoline) has an associated confidence of 97.5%. That means, outside of the isoline, there is less than a 2.5% chance that additional sampling will reveal a single value in a yard greater than the action level. Thus, confidence is high and uncertainty is low that this isoline marks the outer limit of the residential cleanup based on the selected remedial action. Nevertheless, confirmation sampling will be conducted whenever appropriate.*

  The yellow isoline (outer isoline) gave EPA an indication, albeit with less confidence and less certainty, due to lesser sampling frequency, the location of properties that are likely to exceed 500 ppm lead. This isoline was useful for the Proposed Plan and for consideration of an alternative action level for residential yards (i.e., 500 ppm lead, for example, included properties within and around the outer, yellow isoline). Sampling of at least another 900 to 1,000 properties would have been necessary in order to identify the likely outer extent of that alternative action level. The outer isoline, though less certain, gave EPA the best information available for estimating the cost differential between Alternative 2R and Alternative 3R. The outer, yellow isoline does lend some assistance to administrators of ICs, who will in the future make decisions about the need for additional sampling whenever a change in land use is to be considered. As more and more sampling is performed around the outer isoline, statistical certainty and confidence will approach levels of certainty and confidence now afforded by the intensity of sampling that has already been conducted within and around the inner, red isoline.

  As undeveloped lands come under consideration for a change in land use, sampling will be required. This approach is already in practice and has proven to be the most efficient and cost-effective way to deal with proposed changes in land use for undeveloped lands. Landowners and developers are benefited when they work with the County's subdivision review process after a new use is proposed.

- *EPA has provided in the Record of Decision a figure showing the extent of arsenic contamination. The extent of arsenic contamination has been presented in previous site characterization studies. For example, Figure 5-1-6. Isoline map of total surface soil arsenic (ug/g) in the East Helena Area was presented in the Comprehensive Remedial Investigation/Feasibility Study, vol. 1, 1990.*

- *EPA purposely has not established a site boundary. Early soil characterization efforts revealed that the effect of the smelter's emissions were measurable over a large area in the Helena valley. Final cleanup standards and procedures are established in this final ROD,*

which in turn give regulators and administrators of ICs greater authority to correct and manage impacts on human health and the environment than an arbitrary boundary.

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ATTACHMENT

Lewis and Clark City-County Board of Health
Draft Regulations

SECTION 1. AUTHORITY, SCOPE, AND REVISIONS

TITLE

(1) These regulations will be known and cited as: THE REGULATIONS GOVERNING SOIL DISPLACEMENT AND DISPOSAL FOR LEAD CONTAMINATED SOIL FROM EAST HELENA AND THE SURROUNDING AREA IN LEWIS AND CLARK COUNTY, MONTANA.

AUTHORITY

(1) The Lewis and Clark City-County Board of Health promulgates these regulations under the authority of Section 50-2-1 16(2)(l)(i), MCA.

FINDINGS

(1) The Lewis and Clark City-County Board of Health finds that:

(a) The United States Environmental Protection Agency (EPA) has identified and designated East Helena and the surrounding area as a Superfund site, and in 1984 placed such site on the EPA's National Priorities List for clean up and remediation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

(b) The primary lead smelter, owned by ASARCO, is the source of contamination.

(c) East Helena and the surrounding area, as shown in Figure 1, contain lead contaminated soils; and

(d) Regulation of soil displacement is necessary to prevent lead contamination of uncontaminated areas, prevent recontamination of remediated areas, and prevent potential health risks to humans, especially small children; and

(e) These regulations are necessary to protect public health and to control environmental lead pollution within the boundaries of Figure 1.

SCOPE

(1) These regulations apply to any soil displacement, with the exception of landscaping and tilling of agricultural fields and gardens, within the boundaries shown in Figure 1.

(2) ASARCO's primary lead smelter in East Helena, American Chemet, Helena Sand and Gravel, and Helena Regional Airport are excluded from these regulations except when large redevelopment projects are proposed. Prior notification to the East Helena Lead Program is required.

REVISION

(1) After notice and public hearing, the Lewis and Clark City-County Board of Health may revise these regulations to ensure proper administration and to allow for improved mitigation measures for lead-contaminated soil in the area depicted in Figure 1.

SECTION 2. GENERAL REGULATIONS

2.1 PROHIBITED ACTIVITY

(1) No person shall displace soil, with the exception of landscaping and tilling of agricultural fields and gardens, within the area shown in Figure 1 without first complying with the permit procedures and requirements as provided in Section 3, except that, in accordance with Section 9621(e) of Title 42 of the United States Code, nothing contained in this section shall require or be construed to require the obtaining of a permit by any agency, employee, or contractor of the United States, the State, or ASARCO for activities conducted entirely within the East Helena Superfund site carried out in compliance with the provisions of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S. C Section 9601, et seq. and the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901, et seq., and approved by EPA in consultation with the State.

2.2 VIOLATIONS

(1) Failure to have a permit.
(2) Failure to post the permit at the site.
(3) Failure to comply with the permit.

2.3 FEES

No fees will be charged to obtain a permit.

SECTION 3. PERMIT PROCEDURES AND REQUIREMENTS
3.1 APPLICATION PROCESS FOR PERMIT

(1) All persons will abide by the following requirements prior to displacement of soil in the area shown in Figure 1:

(a) Apply for permit.

(b) Make an appointment to meet with Health Department staff to discuss a project plan. The project plan will include, but not be limited to, such information as the location and nature of the proposed activity or development; the dimensions of all surface areas to be displaced; the depth of any proposed excavation and volume of soil to be excavated or displaced. Staff will meet with applicant within five working days.

(c) Submit the project plan for approval.

(1) [sic] At this point, the Health Department staff will examine existing soil sampling records to determine lead levels of the property. If no record of previous sampling exists, the Health Department staff may require sampling of the soil as soon as possible. The soil sampling will occur in the area to be displaced. The soil sampling will be done at no cost to the property owner.

(2) Health Department staff may approve or modify the project plan, which contains the results of soil sampling and the method for controlling contaminated-soil disposal. Approval of plan and issuing a permit will be made within five working days after all information is supplied to staff.

(3) Individual education will be provided for each applicant.

(4) Only after the Health Department staff approves the project plan, will the permit be granted.

(a) The applicant or the applicant's representative must comply with the approved project plan.

(5) The applicant must prominently display the permit tag supplied' by the Health Department at the site until Health Department staff completes the final inspection.

(a) The applicant or the applicant's representative must notify Health Department staff when the project is ready for a final inspection.

(6) Permits will be valid for one year after date of issue.

3.2 CONTROL OF SURPLUS SOIL DISPOSAL

(1) Surplus soil from residential areas may be reused only on the property of origin.

(2) Surplus soils will be transported by the homeowner or by the East Helena Lead Education Program, for disposal to an EPA-approved repository.

(3) Commercial properties may use all of the existing soils on site as long as appropriate plans for barriers and capping have been reviewed and approved by Health Department staff. Excess soils must be transported to an EPA approved repository.

(4) Applicants will be responsible for placing excess soil in an area that is directly accessible to the East Helena Lead Education Program or their contractor, so that the soil can be easily transported. Soil must be stored as directed by Health Department staff.

SECTION 4. ENFORCEMENT AND SEVERABILITY

4.1 ACCESS RIGHTS

(1) The Lewis and Clark City-County Health Department is authorized and directed to make such inspections as are necessary to determine compliance with these regulations.

(2) It is the responsibility of the owner, occupant, or contractor of a property to give the Lewis and Clark City-County Health Department free access to the property at reasonable times for the purpose of making such inspections as are necessary for determining compliance with these regulations.

(3) No person may interfere with representatives of the Lewis and Clark City-County Health Department in the discharge of their duty.

4.2 PENALTIES FOR VIOLATIONS

(1) Violations of any of the provisions of these regulations are a misdemeanor and are punishable as provided for in Section 50-2-124, Montana Code Annotated.

4.3 INJUNCTIONS

(1) The County Attorney may commence an action to restrain and enjoin acts in violation of these regulations. Violation of any such injunction is subject to punishment by the issuing court.

4.4 SEVERABILITY

(1) In the event that any section, subsection, or other portion of these regulations is for any reason held invalid or unconstitutional, such section, subsection, or portion will be considered a separate provision of these regulations and such holding will not affect the validity of the remaining portions of these regulations which will remain in full force and effect.

SECTION 5. DEFINITIONS

CERCLA - The Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986,42 U.S.C. Section 9601, et seq. CERCLA is the law that governs Superfund activity.

COMMERCIAL PROPERTY OR SITES Property or sites having profit as a chief aim, excluding daycares, schools, and agricultural property.

EPA U. S. Environmental Protection Agency.

LEAD-CONTAMINATED SOIL Soil that contains lead in concentrations sufficient to pose unacceptable health risks to children.

PERMIT Means the written authorization from the Lewis and Clark City-County Health Department to disturb the soil in the area shown in Figure 1.

PPM LEAD Lead in soil expressed in parts per million.

RCRA The Resource Conservation and Recovery Act, 42 U.S.C. Section 6901, et seq.

REPOSITORY An EPA-approved location for the disposition of contaminated soils.

RESPONSIBLE PARTY The responsible party is ASARCO.

SOIL DISPLACEMENT Relocation of soil on a single piece of property. Soil displacement does not include landscaping, tilling of agricultural land or gardens when no surplus soil is removed from the area.

SOIL SAMPLING Collection and analysis of surface soil samples taken either as part of the Superfund cleanup action or taken in response to meeting conditions of this permit process. The soil sampling, if required, shall be conducted at no cost to the property owner.

SECTION 6. REPEALER AND EFFECTIVE DATE

6.1 All previous rules, regulations, resolutions and ordinances as adopted by the Lewis and Clark City-County Board of Health governing soil disturbances in Lewis and Clark County are hereby repealed.

6.2 These regulations will be in full force and effect on the day of _____.

6.3 These regulations will be reviewed and evaluated by the Lewis and Clark City- County Board of Health two years from the effective date, and every two years thereafter.

Lewis and Clark City & County Board of Health

Jennifer Winterstenen, Chair
Board Of Health

Melanie Reynolds, Health Officer
Lewis and Clark City-County Health Department

o O o

ADMINISTRATIVE RECORD

EDWARD STIPICH

219 E Riggs
PO Box 1726
East Helena, MT 59635
406-227 6682
Stypic@yahoo.com

PEE

Site # EH File 1.07.06.00
Confidential: Yes ___ No ✓
Admin. Record: Yes ✓ No ___
Key Words/Comments: Comments on proposed plan

footnote: Mr. Stipich is currently a member of the County Board of Health, and a City Councilman; former mayor.

April 16, 2007

Scott Brown
EPA
Federal Building
10 West 15th Street
Helena, MT 59626

Dear Scott,

Since its inception I have been involved in the East Helena Superfund Clean-up. Back then I was mayor of East Helena and I have always had the health and well-being of our citizens at heart. I have not always agreed with the EPA's politics and methods during the clean-up, but after all these years I do agree that it is time to bring the clean-up to an end. As experts have repeatedly stated, it has been a success. Blood lead level studies show that children in the East Helena area have lower blood lead levels than the national average. ASARCO is closed now, and there are no longer any concerns about toxic emission. Yards have been replaced. Is the county willing to replace yards again, when expert doctors from the EPA have asserted this action would not improve blood lead levels in our children and at what cost?

I say, enough is enough. The City of East Helena has been in financial and economic limbo without the ability to expand, attract new business, and enlarge our tax base. It is time to bring closure to the clean-up, so we can move forward, allow economic development and ease the tax burden on our citizens.

Sincerely,
Ed Stipich
Ed Stipich
Councilman

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ADMINISTRATIVE RECORD

EAST HELENA PUBLIC SCHOOLS

School District No. 9

P.O. Box 1280 * East Helena, MT. 59635

Superintendent/Administration Office (406) 227-7700

Eastgate Elementary School (406) 227-7770 * Radley Elementary School (406) 227-7710

East Valley Middle School (406) 227-7740

"Success For All"

PF ENVIRONMENTAL PROTECTION AGENCY

MAR 19 2007

M MONTANA OFFICE

March 12, 2007

Mr. Scott Brown
USEPA
Federal Building
10 West 15th Street, Suite 3200
Helena, MT 59626

Dear Scott,

The East Helena Public Schools (EHPS) Board of Trustees would like to express their support for the finalization of the EPA Record of Decision (ROD). We believe that the ROD is an essential element to the continued well being of this community, its citizens and our children. We believe that the scientific evidence that has been examined by experts in the field has sufficient credibility to support the finalization of this decision. Realizing that this evidence has been examined extensively we now request that the plan be completed quickly for the well being of our community.

The EHPS Board of Trustees strongly supports the ideals of protection of human health and the environment. As a board we believe that the continued support of the EPA, DEQ, Lewis & Clark County officials and the Asarco Corporation will create an umbrella of oversight that guarantees the continued good health of our community from unforeseen challenges.

Sincerely,

Joe Cohenour Chairman	Marcia Ellermeyer Vice-Chair	Mark Diehl Trustee
Don Hoffman Trustee	Kit Johnson Trustee	Ann Marie Thompson Trustee

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ADMINISTRATIVE RECORD

EAST HELENA PUBLIC SCHOOLS

School District No. 9

P.O. Box 1280 * East Helena, MT. 59635

Superintendent/ Administration Office (406) 227-7700

Eastgate Elementary School (406) 227-7770 * Radley Elementary School (406) 227-7710

East Valley Middle School (406) 227-7740

"Success For All"

ENVIRONMENTAL PROTECTION AGENCY
APR 0 2 2007
MONTANA OFFICE

March 28, 2007

Scott Brown
USEPA
Federal Building
10 West 15th Street
Suite 3200
Helena, MT 59626

Dear Scott,

As the Superintendent of East Helena Schools, my chief concern is for the well being of the children and residents of this community. As a teacher, principal and superintendent in this school district for the past 23 years, I feel I have a unique perspective of the current situation. This perspective allows me to see that this community has many protective needs, not just from the lead in the soil, but from the economic damage of not making a decision on proper protective levels as well.

After listening to a number of experts speak on the protective levels recommended by the EPA and hearing the arguments for and against those recommendations, I am concerned about the emotional involvement in this decision and how that has been used to influence an appropriate decision. I'm concerned that a guess or an emotional untested set point will be given credibility when there is scientific evidence and research that shows accurate depictions of protective level set points. I hope that science and common sense rule this decision and not emotional, arbitrary input. Unproven opinions that lack data and scientific evidence, that offer feelings as the basis for decision making, should be weighed carefully in deciding the future of East Helena.

Residents question the validity of such irrational thinking as simply a means to perpetuate for the Asarco business to finance state and federal agencies for their own benefit, not that of the community as a whole. The lack of East Helena community members at the EPA hearings should be an excellent indicator that the community is very satisfied with the proposed plan. Certainly the absolute chaotic meetings of the 80's when the community did NOT support the decisions should be a very good indicator of their support with these recommendations.

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The concerns that I have regarding this ROD are more about making an educated decision than any other point. The City of East Helena deserves to have this process move forward. The data supports the recommendation of the EPA scientists, not the feeling of the opponents of the ROD. Since individuals felt that there was not enough data I decided to look into the matter myself and requested and received the 2006 blood lead data comparisons with the lead concentrations in the soil of their residence and graphed them. That data is attached. Using simple Microsoft Excel graphing tools I was able to plot the points and compare them to the IEUBK prediction and the best fit linear regression line drawn by the EPA scientists (Bill Brattin, et al.). I ask that you review this graph and draw your own conclusions. Since not a single child in East Helena has had a blood level over 10 in the last 7 years, I would be hesitant to conclude that the IEUBK model accurately picks a protective level for our town. Further the average blood lead level of all sampled children in 2006 was 1.3 ug/dl when the national average was 1.7 ug/dl.

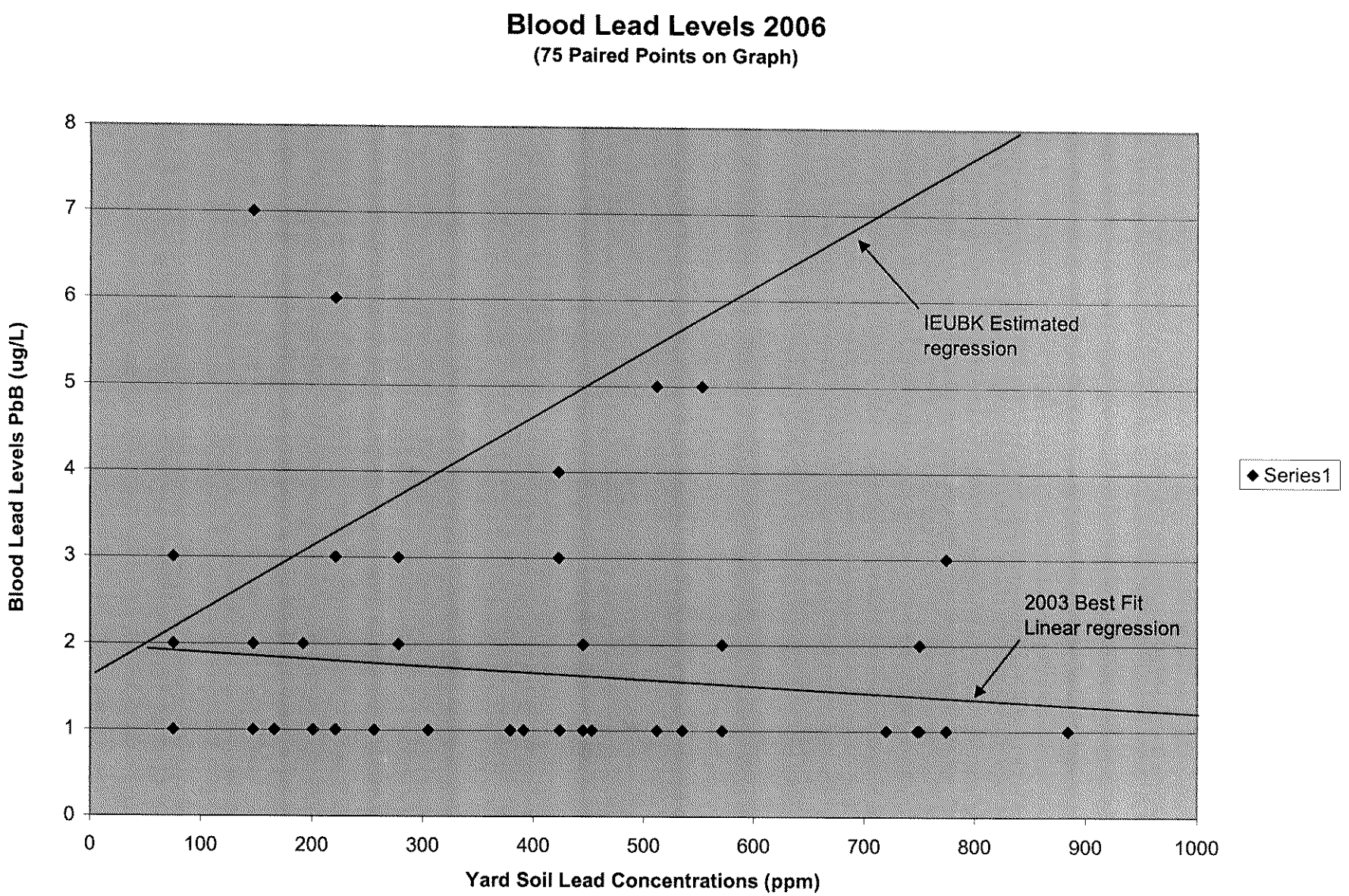
The IEUBK is an extremely close match to the 1993 Hydrometrics Inc. data when graphed with a third data point, the airborne lead particulates. When the air becomes a pathway for ingestion of lead you can clearly see that between 1.5 and 2.5 micrograms of lead dust in a cubic meter of air nearly matches the IEUBK model. My concern is that East Helena has tested hundreds of children and has data to prove that the IEUBK model is not an accurate depiction of the real information we have about East Helena lead pathways. Please consider these details in making a decision regarding approving the ROD. This decision has many far reaching effects on the community that include the economic viability of the town as well as the health of its residents.

Certainly the protection of the residents and the children are paramount, but let's not build a vehicle that has child seat restraints, helmets, pillows and already deployed air bags when making a Record of Decision.

Sincerely,

Ron Whitmoyer
Superintendent

Attachments:
Blood Lead Graph - Excel
Blood Lead Graph -- Hydrometrics


Blood Lead Levels 2006
(75 Paired Points on Graph)
Blood Lead Levels PbB (ug/L)
Yard Soil Lead Concentrations (ppm)
0
1
2
3
4
5
6
7
8
0
100
200
300
400
500
600
700
800
900
1000
IEUBK Estimated regression
2003 Best Fit Linear regression
Series1

EAST HELENA LEAD EVALUATION
Soil/Air/Blood

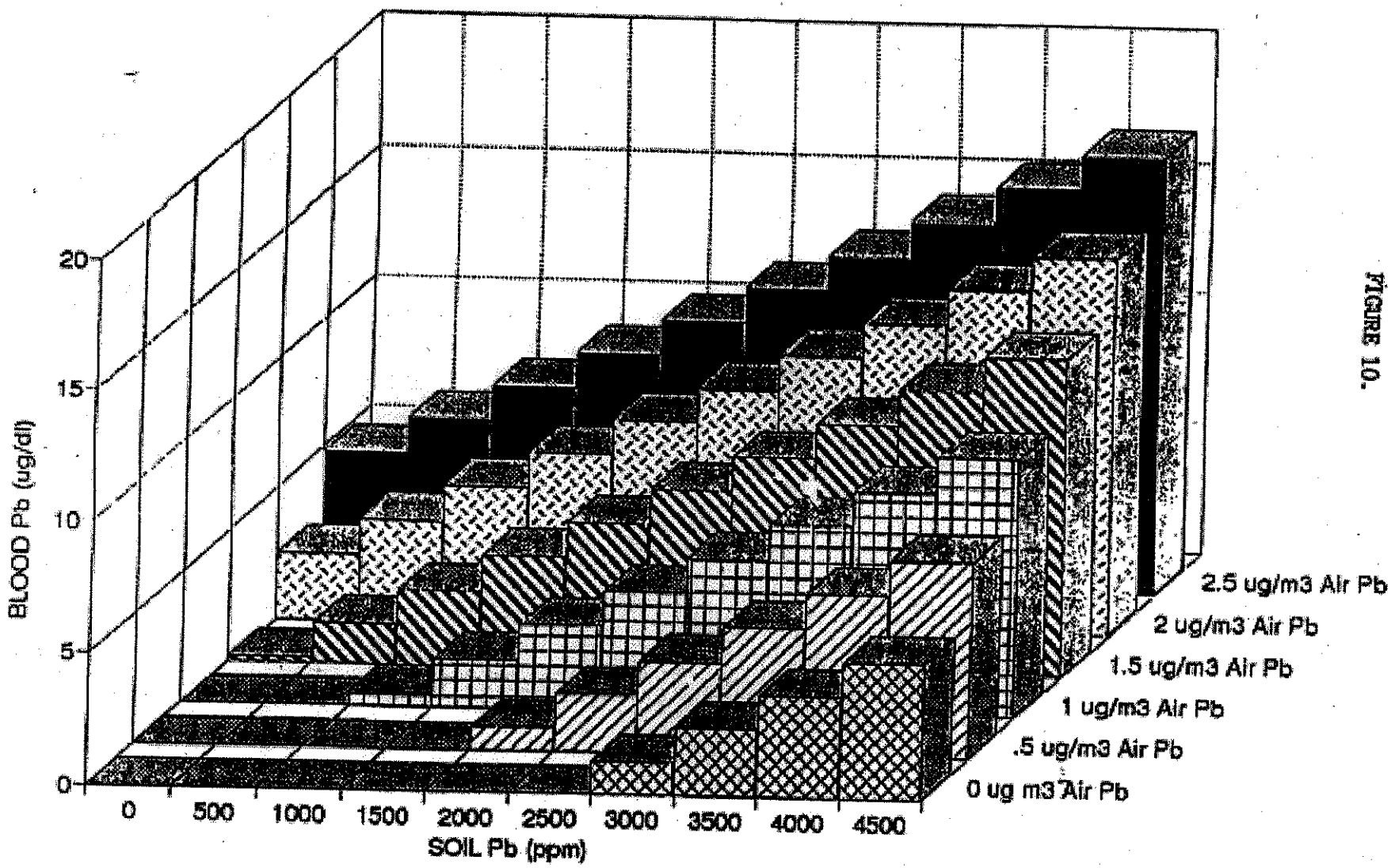


FIGURE 10.

(Source: East Helena, Montana, Soil, Blood and Air Lead Data Evaluation, Hydrometric, Inc, 1993)

ADMINISTRATIVE RECORD

City of East Helena

APR 1 2 2007
MONTANA OFFICE

Site # EH File 1.07.06.00
Confidential: Yes ___ No ✓
Admin. Record: Yes ✓ No ___
Key Words/Comments: Comments on proposed plan

Mayor
Terrie Casey

Council Members
Chris Anderson
Wayne Krieger
Ed Stipich
Anthony Strainer

City Attorney
Mike Rieley

City Clerk
Sandra Milsten

Deputy Clerk
Susan Spotorno

Public Works Director
Jim Rice

Wastewater Superintendent
Bill Casey

Chief of Police
Mac Cummings

City Judge
Larry Murphy

Fire Chief
Troy Maness

P.O. Box 1170
East Helena
Montana 59635

City Offices
406-227-5321

City Fax
406-227-5456

Police Admin.
406-227-8686

April 10, 2007

Mr. Scott Brown
Mr. John Wardell
USEPA
Federal Building
10 West 15th Street
Suite 3200
Helena, MT 59626

Dear John Wardell and Scott Brown:

The City Council of East Helena has been involved in its area's Superfund Cleanup since inception. The City Council wants to be on the record as having unanimously voted in support of Alternative 2R of the Proposed Record of Decision by the EPA.

It is our belief that the blood lead studies show that the clean up program has been a success. The children in East Helena have lower blood levels than the national average. When the program started, the action plan was to clean a yard if any quadrant contained lead levels in excess of 1000ppm. This action level has remained to date. The information provided during the public meeting in East Helena on January 25, 2007, clearly demonstrates that no benefit would be gained by changing that action level.

During the presentation the IEUBK model was discussed. If one had limited, or no background data, it might seem reasonable that the numbers produced from that model could be accurate. However, since many years of data does exist, it seems more reasonable that existing information should be included in the model. The numbers from the blood level studies obviously demonstrate and substantiate the success of the existing action plan and action level. As stated by doctors from the EPA itself, there would be no expectation of improved blood lead levels by cleaning up yards with over 500ppm lead instead of 1,000ppm. If indeed any substantive probability of enhancing the children's health had been shown to result from lowering the action level, the City Council would be supportive of doing so. However, given the information at hand, this late stage of the program is not the time to change the plan.

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It is the City Council's belief that yard cleanup at the existing action level in conjunction with the Lead Education Program appears to be the reason the program has been such a success. The evidence just doesn't support changing that action level when there is no expectation of blood level improvement. Nor does it support the expenditure of many more thousands of dollars.

The City Council is hopeful you will choose Alternative 2R of the Proposed Record of Decision. It is time for the superfund status of the City of East Helena to come to an end and allow us to look forward to the future.

Sincerely,

Terrie Casey, Mayor

cc: Sandra Olson, DEQ
Daryl Reed, DEQ

1.07.06.00
P&E

Scott, EH Response draft

ADMINISTRATIVE RECORD

City of East Helena

Mayor
Terrie Casey

Council Members
Chris Anderson
Wayne Krieger
Ed Stipich
Anthony Strainer

City Attorney
Mike Rieley

City Clerk
Sandra Milsten

Deputy Clerk
Susan Spotorno

Public Works Director
Jim Rice

Wastewater Superintendent
Bill Casey

Chief of Police
Mac Cummings

City Judge
Larry Murphy

Fire Chief
Troy Maness

P.O. Box 1170
East Helena
Montana 59635

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406-227-5321

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Police Admin.
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November 28, 2006

ENVIRONMENTAL PROTECTION AGENCY
DEC - 4 2006
MONTANA OFFICE

Site # EH File 1.07.06.00
Confidential: Yes ____ No ✓
Admin. Record: Yes ✓
Key Words/Comments: City of East Helena comments on draft proposed plan

John Wardell, Director
Region VIII
Helena EPA Office
10 West 15th Street
Suite 3200
Helena, Montana 59626

Dear Mr. Wardell:

The City of East Helena recently received the revised "Plan for Final Cleanup of East Helena's Residential Soils and Undeveloped Lands", which is the predecessor of the Record of Decision. We have some concerns with this plan. The City of East Helena and its residents have been working with EPA for many years to correct the environmental contamination brought about by ASARCO. For nearly 15 years the action level for remediation on residential soils was at 1,000ppm lead. If there was any quadrant of a residential lot that measured 1,000ppm or greater, that yard was cleaned in all areas that had lead levels of 500ppm. This was deemed an adequate measure of cleanup by the EPA and appears to be so as evidenced by the continued success of the blood lead screenings of local children. Our children's blood lead levels are well below the national average. I attribute this success to a number of things, obviously the cleanup of soils, and education of children and their parents, along with making everyone in the community aware of the hazards. The proposed plan has one alternative, 3R, that recommends remediation which there is a measurement of 500ppm lead in the soil. Since 1991 there have been 570 residential lots cleaned up using the trigger action level of 1,000ppm. How will this new plan affect yards that have already been remediated? Will some residences be seen as "contaminated" even though their yards have been remediated under the initial regulations? It seems like a poor plan to begin remediation under one set of regulations and then to change the standards when the end of the cleanup and a Record of Decision is in sight. This has the potential to create conflict within the community and has legal ramifications as far as citizens purchasing property through a realtor and being assured, not only by the realtor, but also by the Lewis and Clark Lead Abatement office, as well as Hydrometrics that their yard has been cleaned up to the designated standards. The City of East Helena has done it's best to maintain a great place for families to live, work, recreate and attend school. We have lived through the troubles of

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being named a Super Fund Cleanup Site and then with the closure of ASARCO. We have been able to maintain the standard of service for our residents, but have begun to use our cash reserves due to the lack of tax dollars from ASARCO. The City and our residents need to see this come to closure. We want to be able to attract new commercial businesses to replace our tax base. If the remediation is too onerous, we will not be able to do this. We want to see the Record of Decision with the continuation of the remediation level at 1,000ppm. The statistics that the Lead Abatement office has, will support this.

We have worked well with the Lewis and Clark County Lead Abatement office and would like to see funding in place for them to continue with the blood testing and education of citizens of the community. They have blended into the community well and they continue to aid the community with site visits to day cares, educating children and parents in nutrition and good hygiene habits. They currently are the handlers of institutional controls (which are voluntary, due to no Record of Decision) and are the most reasonable entity to continue to do so. They work in conjunction with the Lewis and Clark Department of Health, East Helena City Council, and Lewis and Clark County Health Department.

The City of East Helena has worked with the EPA in the past and expects to continue to do so in the future. We need some help. We have a city to continue to operate, the health of the residents is in better condition with the changes that have been implemented over the years. We want the Record of Decision to continue with the level of remediation that was originally put in place so we can move on. The Council and I are available to meet with you to discuss this letter and any concerns you may have. Thank you.

Sincerely,

Terrie Casey, Mayor

Cc: Scott Brown – EPA
Richard Opper – DEQ
Jan Williams – Lead Abatement Office
Deb Tillo – Lead Abatement Office

1.07.06.00 P&E

LEWIS AND CLARK CITY-COUNTY BOARD OF HEALTH

ADMINISTRATIVE RECORD

Joan Miles, J.D.
Director
MT DPHHS
PO Box 4210
Helena MT 59604

Re: Request for Comments by DPHHS on Proposed Plan

Dear Joan:

On behalf of the Lewis and Clark City-County Board of Health, I am writing to request that the Montana Department of Public Health and Human Services (DPHHS) review and submit comments on the Proposed Plan for Final Cleanup of East Helena's Residential Soils and Undeveloped Lands. The comment period ends March 16, 2007. A request to EPA by the Board of Health is pending to extend the comment period.

The issues involved in the Proposed Plan are complex and have significant, far-reaching public health implications for our county. Because responsibility for implementing institutional controls and protecting public health in East Helena may involve the Board of Health and City-County Health Department, we respectfully request review and comments by your agency.

I would be happy to discuss this request in more detail. Thank you for your assistance.

Sincerely,

Melanie Reynolds

Melanie Reynolds, M.P.H.
Health Officer
Lewis and Clark County

Cc: Board of County Commissioners
✓ Scott Brown, E.P.A.
John Wardell, E.P.A.
Richard Opper, D.E.Q.
Daryl Reed, D.E.Q.
Steve Helgerson, DPHHS
Jane Smilie, DPHHS

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ADMINISTRATIVE RECORD

LEWIS AND CLARK
CITY-COUNTY BOARD OF HEALTH

1930 Ninth Avenue
Helena, Montana 59601
Telephone 4-HEALTH or dial 443-2584
Fax 406-457-8990

P&F
Site # EH File 1.07.06.00 ENVIRONMENTAL
Confidential: Yes ____ No ✓ PROTECTION AGENCY
Admin. Record: Yes ✓ No ____ APR 13 2007
Key Words/Comments: Comments on Proposed Plan MONTANA OFFICE

April 13, 2007

Mr. Scott Brown
U.S. EPA, Federal Building
10 West 15th Street, Suite 3200
Helena, MT 59626

Subject: Comments on the Proposed Plan for East Helena Residential Soils

The Lewis & Clark City-County Board of Health (BOH) would like to take this opportunity to present comments to the United States Environmental Protection Agency (EPA) regarding the Proposed Plan for Final Cleanup of East Helena's Residential Soils and Undeveloped Lands (Proposed Plan). The mission of the Lewis & Clark City-County Health Department (the "Health Department") is to improve and protect the health of all County residents. The Health Department administers the East Helena Lead Education and Abatement Program and has worked collaboratively with the East Helena community, EPA, and the Montana Department of Environmental Quality (MDEQ) since 1996. Once the BOH received the Proposed Plan in January 2007, we performed a detailed review of the Plan, numerous supporting documents, as well as epidemiological, toxicological, and EPA guidance reports. In addition, the BOH has been involved in several discussions and informational sessions and has attended training for long-term stewardship of hazardous waste sites. A thorough review was necessary to provide substantive comments from the BOH's long-term public health perspective.

The role of the Health Department (including its governing Board of Health) will increase significantly once the EPA and Potentially Responsible Parties have completed remedial actions to alleviate health threats posed by contaminated soils in and around East Helena. Indeed, the Health Department will be the entity primarily responsible for implementation and management of the institutional controls associated with the cleanup alternatives, including not only the continuation of educational programs, but potentially verification sampling at proposed land developments and assessment of indoor contaminant levels.

Our primary responsibility for the East Helena cleanup is protection of public health. However, because of the management responsibilities and potential liability that would be imposed on the Health Department by the use of institutional controls, we also must comment on long-term efficacy of the Proposed Plan. Our review of the Proposed Plan and numerous supporting documents, including epidemiological and toxicological studies as well as EPA guidance and reports from other similar projects at listed National Priorities List (NPL) sites, has convinced us that EPA has not substantiated the rationale for selection of the Preferred Cleanup Alternative. Our reasons, provided in the form of general comments, specific comments and questions on the following pages, are generally based on a lack of supporting documentation, inconsistency with EPA guidance, and the use of uncertain assumptions by EPA to document contaminant exposure potential and predicted health risks.

The most obvious concern we have with the Preferred Cleanup Alternative, and one that has received the most public attention, has to do with cleanup levels for residential soils. EPA has proposed an action level of 1,000 parts per million (ppm) lead in soil for cleanup, despite the Agency's own deterministic risk assessment indicating a protective cleanup level would be 520 ppm. We acknowledge two elements of this debate. First, as EPA has pointed out and used as a justification for the higher action level, lead concentrations in children's blood have steadily decreased the past 10 years, and are now equivalent to national averages. This is a notable success for the agencies involved and the community of East Helena. The second component of the debate is, however, more compelling and stems from the Health Department's responsibility for health protection, now and in the future.

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EPA's preferred remedy may only be currently protective of children's health (with respect to lead) because of the education and outreach program. This means the program will have to be implemented in perpetuity; otherwise, without adult awareness and intervention (in the form of voluntary testing of children) blood lead levels may well increase given the exposure scenarios remaining in East Helena yards and surrounding lands. Indeed, this is what EPA's own risk assessment would predict, with an action level of 1,000 ppm in residential soils.

The BOH has concerns regarding the long-term protectiveness of the preferred cleanup alternative and believe it relies too heavily on institutional controls like community education and blood lead testing. Clearly, an education and testing program would always be subject to adequate funding levels, advocate support, and changing political priorities. Our preference is for a remedy that would eliminate, or at least substantially reduce, the need for perpetual oversight, monitoring, education and intervention. We believe lower cleanup levels may achieve that objective.

This is not to say that the BOH is in disagreement with all aspects of the EPA's Preferred Alternative. We believe there are many positive attributes to alternatives incorporated in the Proposed Plan, not least of which are the achievements of the blood-lead education and monitoring program. However, we are convinced that a more protective remedy can and should be implemented, and this can only be done through a collaborative process involving, at a minimum, EPA, MDEQ, the East Helena community, the Health Department, and other appropriate stakeholders.

We understand the urgency felt by many in East Helena to make a final decision on residential soils and implement the remedy. Residents of East Helena deserve closure, not just from the disruption of yards and neighborhoods, but also with respect to future economic development of properties in and around the city. We concur that all effort should be taken to reach a decision. However, the BOH believes we should not sacrifice deliberative and substantiated decision-making to expedite a process that has already consumed more than twenty years of study and response. The BOH will commit all available resources to work with East Helena, MDEQ, EPA and other stakeholders in the coming months to develop a remedy that is fully protective of residents and minimizes, to the extent possible, future liability to the County and landowners.

Please do not hesitate to contact Melanie Reynolds, County Health Officer at 457-8910 should you have questions concerning our comments, or to discuss future deliberations for this important decision.

Sincerely,

Christine Deveny

Christine Deveny
Vice Chair
Lewis & Clark City-County Board of Health

Melanie Reynolds

Melanie Reynolds, M.P.H.
Health Officer
Lewis and Clark City-County Health Dept.

Cc: John Wardell, EPA
Sandi Olsen, MDEQ
Daryl Reed, MDEQ
Mary Capdeville, MDEQ
Mayor Terrie Casey, East Helena
Lewis & Clark Board of County Commissioners
City-County Board of Health

Attachment: Lewis & Clark City-County Board of Health's comments

LEWIS & CLARK CITY-COUNTY BOARD OF HEALTH'S COMMENTS FINAL CLEANUP OF EAST HELENA'S RESIDENTIAL SOIL AND UNDEVELOPED LAND

1.0 INTRODUCTION AND PURPOSE

The Lewis & Clark City-County Board of Health (BOH) would like to thank the United States Environmental Protection Agency (EPA) for this opportunity to comment on the Proposed Plan for Final Cleanup of East Helena's Residential Soils and Undeveloped Lands (Proposed Plan). The mission of the Lewis & Clark City-County Health Department is to improve and protect the health of all County residents. The City-County Health Department administers the East Helena Lead Education and Abatement Program and has worked with the East Helena community, EPA, and the Montana Department of Environmental Quality (MDEQ) since 1996. Once the BOH received the Proposed Plan in January 2007, we performed a detailed review of the Plan, numerous supporting documents, as well as epidemiological, toxicological, and EPA guidance reports. In addition, the BOH has been involved in several discussions and informational sessions and has attended training for long-term stewardship of hazardous waste sites. A thorough review was necessary to provide substantive comments reflecting the BOH's responsibility to improve and protect the long-term health of residents in our communities. Our comments are presented below.

2.0 GENERAL COMMENTS

2.1 ARSENIC CLEANUP LEVEL, PRG OF 176 PPM

The BOH does not agree that the arsenic Preliminary Remediation Goal (PRG) of 176 parts per million (ppm) is health protective. The PRG was calculated using a target risk of 1.499E-04, which exceeds EPA's acceptable risk range of 1E-06 to 1E-04 (i.e., one in one million to one in ten thousand) (USEPA, 1991) and MDEQ's acceptable risk range of 1E-05 to 1E-06 (i.e., one in one hundred thousand to one in one million). Although EPA guidance indicates that when risks are being *estimated* they should be considered accurate to one significant figure (USEPA, 1989), the BOH does believe it appropriate to intentionally select the largest target risk that may mathematically be rounded down to 1.0E-04. In addition, EPA indicates a preference for remedies that will achieve the more protective end of the range (i.e., 1.0E-06). Therefore, the arsenic PRG should be recalculated using a target risk within both EPA's and MDEQ's acceptable risk ranges, as well as considering appropriate background concentrations. The BOH acknowledges that background concentrations in Montana may exceed 1.0E-05 (MDEQ, 2005) and must, therefore, be considered in the development of the site-specific PRG for arsenic in East Helena.

The recalculation of the arsenic RPG should include the contribution from the dermal exposure pathway that was previously omitted (ISSI, 1999). Considering a site-specific relative availability (RBA) for arsenic is not available, the RBA should be conservatively estimated in the 80 to 100% range (as was used in the 1989 [Hunter Services] and 1995 [Kleinfelder] risk assessments), rather than the estimate of 50% used to calculated the arsenic PRG (ISSI, 1999, 2001).

Cleanup levels selected for arsenic in soils at other mining and mineral processing sites also suggest the East Helena PRG is not protective. For example, 70 ppm of arsenic or greater in soils is the threshold selected by EPA for residential yard removal and replacement at the Vasquez Boulevard & I-70 superfund site in Denver. Arsenic cleanup levels for residential soils are all 100 ppm or less for the ASARCO/El Paso Smelter site, Coeur d' Alene basin, Jacobs

Smelter in Utah, Midvale Smelter in Utah, Sharon Steel in Utah, and ASARCO/Globe Site in Colorado. Closer to home, Montana DEQ has established a "generic" 40 ppm action level for arsenic in soil that is based on carcinogenic and non-cancer risk analysis (MDEQ 2005).

It is also worth referring to the 1991 Remedial Investigation/Feasibility Study (RI/FS) which presumably provides the basis for the Proposed Plan. This document assessed concentrations of a number of metals and metalloids in residential soils, and used a risk-based modeling approach to develop remedial goals. The target concentration identified in the RI/FS for arsenic is 45 ppm, approximately ¼ the PRG noted in the Proposed Plan (Hydrometrics 1991; see Table 10-6-1).

It is the opinion of the BOH that the arsenic contamination remaining in soils may well be a "source of concern" to the community in that cancer probability from exposure to these soils may exceed EPA's range of acceptable risk. It should be noted that EPA's Proposed Plan seems to acknowledge this possibility, in stating: "As arsenic concentrations in soil rise above that value, however, long term exposures (lifetime) present risks that may be unacceptable."(page 32). We would also note that it is erroneous to equate average arsenic levels below 80 ppm to "near natural levels." According to EPA's supporting documentation for East Helena, the background arsenic levels used for comparison range from 15 to 18 ppm, with an average of 16.5 ppm. (Hydrometrics 1991; Table 5-1-1).

2.1.1 Soil Sampling and Analysis for Arsenic

The soil sampling and analysis approach is not described in the Proposed Plan for either residential yards or undeveloped land. A Modification of the Administrative Order on Consent for the East Helena Residential Soils Removal Action (USEPA, 1992) indicates that 5 sampling points are used within each removal unit (i.e., residential yard quadrant). Soil is removed to the depth needed to reduce the remaining lead concentration to below 440 ppm and the arsenic concentration to below 100 ppm. The BOH requests that a detailed Standard Operating Procedure (SOP) be provided describing the soil sampling and analytical approach, including the justification for determining the depth to which soils are excavated in residential yards.

The analytical method is not described in the Modification, but we understand that field portable X-Ray Fluorescence (XRF) analyzers are used to determine arsenic concentrations. Because XRF technology is a field screening approach and is not considered as accurate as laboratory analyses (i.e., EPA Method 6000/7000 Series using EPA SW-846 protocols for Quality Assurance/Quality Control requirements [QA/QC]), the BOH recommends that a Quality Assurance Project Plan (QAPP) be implemented to validate the accuracy and precision of the field screening data (at least to a limited extent).

2.1.2 Arsenic Toxicity

The development of the arsenic PRG should also allow for the uncertainty associated with the toxicity of arsenic, a known human carcinogen. For example, the California Environmental Protection Agency (Cal-EPA) considers arsenic more toxic than EPA and has adopted a cancer slope factor for arsenic that is 9 times greater than the arsenic cancer slope factor available from EPA (USEPA, 2004a).

2.2 LEAD CLEANUP LEVEL OF 1,000 PPM

Although not clearly described in the Proposed Plan, the BOH understands (through correspondence and discussions with EPA) the lead cleanup level was determined based on the blood lead data from East Helena and a quantitative uncertainty analysis using EPA's Integrated Exposure Uptake Biokinetic (IEUBK) Model.

First, the BOH does not agree that the data from the blood lead studies should be used in establishing the lead cleanup level. EPA guidance indicates, "The Office of Solid Waste and Emergency Response (OSWER) recommends that blood-lead studies not be used to determine future long-term risk where exposure conditions are expected to change over time; rather, they be considered a snapshot of ongoing exposure under a specific set of circumstances (including community awareness and education) at a specific time" (USEPA, 2006a). It is the opinion of the BOH that several factors are likely contributing to the measured blood lead levels in East Helena and do not represent the future, potential health risks to soil and dust exposures. Factors that may be affecting the blood lead studies include, but are not limited to, community awareness/education, evaluation of a non-random, convenience sample (i.e., voluntary participation), the cleanup of several residential yards in East Helena since 1991, the cessation of smelter emissions, and the discontinuation of leaded gasoline. Furthermore, although the blood-lead studies appear to be representative both spatially and based on soil lead concentrations (USEPA, 2007), the blood-lead studies are not true epidemiological studies that incorporate several additional factors, such as socioeconomics and education level of the parents.

Second, differing opinions regarding the quantitative uncertainty analysis exist within EPA. It is the BOH's understanding that the EPA Region VIII toxicologists believe a quantitative uncertainty analysis can be used in conjunction with the IEUBK to develop a range of potential cleanup values; while, EPA's Technical Review Workgroup for metals and asbestos (TRW) believe a deterministic assessment resulting in a single cleanup value is appropriate (TRW, 2006). The TRW is an EPA interoffice workgroup with the specific mission to review applications of lead risk assessment methodologies and is responsible for developing national guidance and documentation on the structure, application, and validation of the IEUBK Model. The BOH does not have the level of expertise to determine which EPA opinion is the most scientifically valid for East Helena. In the interest of protecting public health, we believe it is prudent to use the more conservative approach, in which the deterministic assessment is used to generate a single cleanup value.

Consequently, the BOH believes that a deterministic approach using predictive blood lead modeling should be used to establish a health-protective cleanup level for lead in East Helena. Blood lead modeling should be focused on the most-sensitive potential receptors (i.e., children and fetuses). The IEUBK Model is appropriate for childhood receptors; however, the BOH has specific recommendations for input values that are described in the following section. EPA's Adult Lead Model is appropriate for estimating fetal blood lead concentrations for pregnant women exposed to lead contaminated soil (USEPA, 1996). Fetal blood modeling should be included in the development of a health protective lead cleanup level in East Helena. Specifically, a soil contact-intensive scenario should be evaluated to assess the health protectiveness of the lead cleanup level for fetal receptors (e.g., a pregnant female construction worker exposure scenario) (USEPA, 2004b).

2.2.1 IEUBK Modeling

In performing the IEUBK modeling, the BOH believes it is appropriate to use the site-specific data obtained for (1) the soil/dust absorption fraction of 71% *relative* bioavailability (35.5% when expressed as an *absolute* bioavailability) (USEPA, 1999b) and (2) the fraction of soil in dust term of 0.17. The remainder of the exposure parameters should not be adjusted from the default values, as described below:

- Soil Ingestion Rates - EPA guidance indicates the default soil and dust ingestion values are based on several observation studies of soil ingestion in children and are appropriate and representative estimates of soil ingestion for U.S. children. The IEUBK Model was calibrated and validated with the default soil/dust ingestion values; therefore, EPA (2006a) indicates it is unknown how the use of alternate ingestion rates would impact the model predictions. Adjustments to the soil/dust ingestion rates may only be made after approval by EPA's Office of Emergency and Remedial Response (OERR).

Before the soil/dust ingestion rates measured in the Anaconda study could be used in the IEUBK Model, the ingestion study (Stanek and Calabrese, 2000) must be submitted to OERR for review by the Technical Review Workgroup for metals and asbestos (TRW). If the OERR approves of the adjustment to the soil/dust ingestion rates, they will be incorporated into the guidance and shared among other EPA Regions (USEPA, 1999a). Therefore, the BOH believes the default soil and dust ingestion values are most appropriate.

- Geometric Standard Deviation (GSD) - EPA guidance (USEPA, 2006a) indicates that site-specific estimates of GSD should not be substituted for the default value without detailed, scientifically defensible studies documenting site-specific differences in child behavior or lead biokinetics. Such site-specific studies are not available for East Helena. Therefore, the BOH believes the default GSD is most appropriate.

The BOH appreciates the responses from and the discussions held with EPA Region VIII toxicologists regarding this issue. We understand from these discussions that the EPA Region VIII toxicologists have a differing opinion than the TRW regarding the use of variable inputs, specifically for soil ingestion rates and GSD (TRW, 2006). In the interest of protecting public health, we have chosen the more conservative of the EPA opinions (i.e., TRW).

Using the appropriate input values (as described above), the IEUBK Model predicts a lead cleanup concentration of 520 ppm (using the geometric mean as the point estimate). In other words, a lead cleanup concentration of 520 ppm would limit the risk of childhood blood lead levels exceeding 10 micrograms per deciliter (μg/dl) to 5% of the population (i.e., the current OSWER cleanup goal) (EPA, 1994).

2.2.2 Soil Sampling and Analysis for Lead

The soil sampling and analysis approach is not adequately described in the Proposed Plan for either residential yards or undeveloped land. A Modification of the Administrative Order on Consent for the East Helena Residential Soils Removal Action (USEPA, 1992) indicates that 5 sampling points are used within each removal unit (i.e., residential yard quadrant). Soil is removed to the depth needed to reduce the remaining lead concentration to below 440 ppm and the arsenic concentration to below 100 ppm. The BOH requests that a detailed SOP be provided describing the soil sampling and analytical approach, including the justification for determining the depth to which soils are excavated in residential yards.

The analytical method is not described in the Modification, but based on communications and discussions with EPA we understand that field portable XRF analyzers are used to determine lead concentrations. In addition, XRF measurements were initially validated against laboratory analyses, but were discontinued as the level of confidence increased with the XRF data. Because XRF technology is a field screening approach and is not considered as accurate as laboratory analyses (i.e., EPA Method 6000/7000 Series using EPA SW-846 protocols for Quality Assurance/Quality Control requirements [QA/QC]), the BOH recommends that a QAPP be implemented to validate the accuracy and precision of the field screening data (at least to a limited extent).

In addition, it is the BOH's opinion that the lead cleanup level should be based on the lead concentration in the fine soil fraction. EPA guidance for sampling and analysis of soil at lead sites (USEPA, 2000) indicates that the concentration of lead from the fine fraction of soil (<250 microns) is relevant for exposure from incidental soil ingestion and should be used over bulk soil analysis. The fine soil fraction is the particle size soil fraction expected to stick to fingers and, thus, become incidentally ingested. In addition, the fine soil fraction is the most likely fraction to accumulate in indoor environments as dust. The Technical Review Workgroup for metals and asbestos (TRW) reviewed data from several Superfund sites and demonstrated that the

concentration of lead in the fine soil fraction differs from the concentration in the bulk soil with an enrichment of lead and other metal contaminants observed in the fine soil fraction.

The EPA lead models consider the fine soil fraction to be the primary source of the ingested soil and dust. Fine soil fraction lead concentrations are the recommended input for both the IEUBK and the Adult Lead Model (USEPA, 2000). A site-specific lead enrichment equation can be developed to relate lead concentrations in the bulk soil and fine fraction (USEPA, 2000).

2.2.3 Lead Toxicity

The development of the lead cleanup level should also allow for the uncertainty associated with the toxicity of lead, a probable human carcinogen. Recent data indicates that blood lead levels below 10 µg/dl may cause significant health effects. EPA (2006b) indicates "Even children with low lead exposure levels (having blood lead levels of 5 to10 µg/dl or, possibly, somewhat lower) are at notable risk, due to the apparent non-linear dose-response relationships between blood lead and neurodevelopmental outcomes". Further, EPA (2006b) indicates "There is no level of lead exposure that has yet been identified, with confidence, as clearly *not* being associated with possible risk of deleterious health effects". Regarding fetal exposure, studies have found that women who have been exposed to lead in childhood have accumulated large stores in their bones that may mobilize from bone to blood during late pregnancy and lactation. An increased risk of spontaneous abortion, neurobehavioral deficits in offspring and, in some studies, gestational hypertension, have been reported at pregnancy blood lead levels at concentrations less than 10 µg/dl (EPA 2006b).

The BOH appreciates the information provided from EPA (2007) regarding the Centers for Disease Control explanation for the present level of concern of 10 µg/dl (used in the current OSWER cleanup goal). Indeed from this explanation, and recognition that many current environmental and public health policies at the federal level do not represent scientific consensus, it is possible that the level of concern may not be lowered at anytime in the foreseeable future. Then again, over the past few decades, the blood lead level of concern has decreased from 40 µg/dl to 10 µg/dl. The BOH believes it is reasonable to anticipate the level may decrease again in the future. Our belief is supported by substantial current scientific literature. EPA has noted as recently as October, 2006: "Some recent studies of Pb neurotoxicity in infants have observed effects at population average blood-Pb levels of only 1 or 2 µg/dl; and some cardiovascular, renal, and immune outcomes have been reported at blood-Pb levels below 5 µg/dl." (EPA 2006b) As such, the lead cleanup level should be developed taking into consideration this possibility.

2.3 CLEANUP ALTERNATIVES

The BOH does not believe a sufficient number of cleanup alternatives were developed in the Proposed Plan. In particular, the range of alternatives for residential soils was too limited. The Proposed Plan does not:

- Describe the other remedial alternatives that were considered and dismissed from consideration; or
- Provide rationale for why protective remedies (such as testing of indoor spaces and insulation removal, where warranted) are not included in the alternatives.

EPA should expand the development of alternatives to allow for a more thorough review of potential remedies for East Helena soils. Funding mechanisms should be included in and described for all of the alternatives.

Specifically, the BOH requests that alternatives be developed and evaluated with the goal of fully remediating the lead and arsenic contamination in East Helena to health protective levels that would minimize the complexity and longevity of the institutional controls. Elements of such an alternative should include, but not be limited to, the following:

- Complete the remediation of residential soils to health protective cleanup goals
- Complete the remediation of streets and road aprons to health protective cleanup goals
- Prepare a projected land use forecast through the Joint Consolidated City-County Planning Board and the East Helena City Council with public participation, so as to accurately forecast and designate future land uses (and thereby establish appropriately protective soils cleanup levels)
- Develop a cost estimate to remediate undeveloped lands based on the projected land use forecast
- Fully fund remedial approaches based on projected land use
- Provide funding for residents of homes (that were constructed prior to closure of the smelter) within the East Helena study area to replace exposed insulation (such as in attics) that may have accumulated substantial quantities of airborne contaminants
- Establish Institutional Controls to manage the remediation fund and oversee remediation and to track mandatory and voluntary remedial actions.

2.4 PREFERRED CLEANUP ALTERNATIVE

The BOH has concerns that the Proposed Plan does not appear to conform with EPA guidance or statutory requirements. In particular, the lack of transparency in development and screening of alternatives has prevented the public from understanding the range of possible alternatives considered, or the benefits and drawbacks associated with these options. Typically, a proposed plan is tiered from a remedial investigation/feasibility study (RI/FS), which provides the detailed supporting documentation for possible alternatives: costs, effectiveness, technical feasibility, and so forth. However the only RI/FS referenced in the Proposed Plan dates to 1991 (Hydrometrics, 1991). Considering the 16 years of experience EPA has gained since that RI/FS, studying and attempting to remediate metals-contaminated sites across the U.S., there surely have been technological and policy advances that should be incorporated into the alternatives. It should be noted that most of the EPA guidance concerning risk assessment, remedial actions, site studies, and decision-making has been published or revised since 1991, strongly indicating that the sole RI/FS for soils cleanup should have been revised, or at least supplemented, before publication of a Proposed Plan.

EPA has indicated that the RI/FS has been updated, and notes on page 17 of the Proposed Plan: "Many of the alternatives developed at that time, however, are no longer considered viable; due principally to the substantial amount of cleanup that has since occurred. Therefore, EPA developed new alternatives that incorporate many of the features of the original alternatives, but are relevant for current conditions." If this is the case, EPA should provide the new analysis disclosing how and why some alternatives are no longer viable. The supporting documentation for new alternatives should be made available to the public for review, and the Proposed Plan should specifically reference these documents.

One example of the problems raised in using a 15+ year old RI/FS is conformance with guidance and statute. For example, as noted in the Proposed Plan (page 26), the alternatives must be evaluated against nine criteria. One of the threshold criteria that must be met is compliance with state and federal regulations (i.e., Applicable or Relevant and Appropriate Requirements [ARARs]). The Proposed Plan indicates the EPA has evaluated the alternatives for compliance with ARARs, but there was no documentation referenced or readily available for public review that would substantiate this conclusion. The only document discussing ARARs that we found applicable to the East Helena residential soils is the 1991 RI/FS (Hydrometrics, 1991). It is reasonable to expect that some state and federal regulations will have changed since that time, and an updated analysis is critical. If this has been done (for example, with the "new" alternatives that EPA references on page 17 of the Proposed Plan) then EPA should make the analysis readily available to the public.

Similarly and in general, the EPA should supply a specific list of reference documentation pertinent to the Proposed Plan. Otherwise, it is very difficult for the public and public agencies to identify and locate documentation relevant to the subject.

According to EPA guidance, the Proposed Plan should provide "either a summary of the support agency's agreement with the plan or its dissenting comments" (EPA 1999c). This requirement is clearly supported by statute, as "EPA must respond to State comments.....on the Preferred Alternative when making the RI/FS and Proposed Plan available for public comment" (NCP §300.515(d)(4)). A responsiveness summary addressing comments from MDEQ was not included in the Proposed Plan. By not making interested parties fully aware of MDEQ's dissenting comments and publishing them in the proposed plan, EPA has failed to meet its statutory public disclosure obligations or follow its own guidance for the CERCLA decision-making process.

2.4.1 Scope of Preferred Cleanup Alternative

For the Preferred Cleanup Alternative to be protective of human health and environment, it is the BOH's opinion that the scope of the alternative must be expanded. Specifically, the Preferred Cleanup Alternative should address the following:

- Arsenic - The Proposed Plan does not present cleanup alternatives specific to arsenic. Rather, it indicates that because arsenic is co-located with lead, it should be mitigated through the remedy directed at lead in soils. It is the opinion of the BOH that the Preferred Cleanup Alternative should be revised to ensure the arsenic cleanup level is attained. For example, Alternative 2R should be revised as follows: Selected Soil Removal (lead cleanup level [ppm] and arsenic cleanup level [ppm]), Continuing Community Education, and Institutional Controls.

- Attic Dust – To prevent subchronic, acute exposures to high concentrations of metals that may be present in the attic dust of homes in East Helena, the Preferred Cleanup Alternative should include measures to prevent such exposures. Acute exposures to attic dust have been reported in other smelter areas (Montana Standard, 2004). In addition, the Record of Decision (ROD) for the Butte Priority Soils Operable Unit of the Silver Bow Creek/ Butte Area Superfund Site includes measures to mitigate attic and other household dust traps that may have accumulated substantial metal and metalloid concentrations during operational years of the smelter.

- Other potential pathways for metal exposure - for example contaminated soil in earthen – walled basements or crawl spaces, and dust in heating and venting ducts.

- Rodeo Grounds – The soils of the rodeo grounds contain very high concentrations of lead and arsenic. To prevent subchronic, acute exposures largely due to fugitive dust emissions, the Preferred Cleanup Alternative should include measures to prevent such exposures.

- Prickly Pear Creek Upstream Contaminant Sources – The Proposed Plan should include measures to assure that upstream contaminant sources, such as slag piles, ore storage areas, and the process ponds, are adequately contained or removed to prevent re-contamination of the Creek sediments during major storm and flooding events.

2.4.2 Long-Term Effectiveness and Permanence of the Preferred Cleanup Alternative

The City-County Health Department administers the East Helena Lead Education and Abatement Program. The purpose of this Program is to prevent and reduce elevated blood lead levels in children and we assist in this effort by coordinating blood lead screenings, providing education to

at-risk groups, and conducting voluntary environmental assessments. The BOH believes this program has been effective and are pleased with our working relationship with EPA and MDEQ. However, the BOH believes the Preferred Cleanup Alternative relies too heavily on institutional controls, including community education, which, in turn, minimizes the alternative's long-term effectiveness and permanence. Because institutional controls play a very significant role in the Preferred Cleanup Alternative, the BOH believes it will necessitate in-perpetuity blood lead monitoring of the children of East Helena. In addition, contamination will remain at undeveloped lands (until the land use is changed) requiring the City-County Health Department and other local government entities to oversee these undeveloped lands and their potential, future remedial actions.

It is the opinion of the BOH that additional alternatives should be developed and evaluated that will focus on the Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment and, thereby, maximize the Long-Term Effectiveness and Permanence of the remedy.

2.4.3 Implementability of the Preferred Cleanup Alternative

2.4.3.1 Deep Tillage for Undeveloped Lands

The BOH has concerns with the implementability of the deep tillage remedy for undeveloped lands proposed under the Preferred Cleanup Alternative. These concerns must be addressed prior to the selection of the Final Cleanup Alternative. These concerns are listed below:

- In Place Treatment - deep tillage should not be presented as a *treatment* remedy, nor is it an *innovative* technology (it has been used on sites for many years, and was included as an option for undeveloped lands in East Helena more than 16 years ago; Hydrometrics 1991). Deep tillage dilutes the contaminant concentration in the surface soil through mixing with deeper soil. Further, EPA's characterization of the "reductions" in lead concentrations are misleading, as the Proposed Plan does not also point out that the total mass of contaminant in the subsurface is not lessened by tilling.

- Mobilization - deep tillage may mobilize contaminants to concentrate in other, deeper strata at levels even greater than were found in the target shallow zone. The BOH believes the EPA should provide a more detailed assessment of the mobilization potential associated with this remedy.

- Rocky geology – rock out-croppings in the surface and near surface geology may prevent effective deep tillage of soils. In a treatability plot performed in the Asarco West Field, the maximum attainable tillage depth was 20 inches even with prior field preparation using a dozer to rip to 15 inches below ground surface (Hydrometrics, 1997). The desired tillage depth for the treatability plot was 30 inches. Considering that numerous subsurface rocks will likely be encountered in many locations, the BOH believes the EPA must provide an alternate remedy for such locations/conditions.

- Increased soil volume – deep tillage will likely increase the volume of soil as "loose" soil volumes are typically significantly greater than "compact" soil volumes. The Preferred Cleanup Alternative must consider options for the increased soil volume, particularly if the approach is not successful in achieving the lead and arsenic cleanup levels.

- Weed management – disturbance of soil through deep tillage may cause weed infestation problems. Weed management practices and funding should be considered for the Preferred Cleanup Alternative.

2.4.3.2 Institutional Controls

The BOH has several concerns with the implementability of the institutional controls that must be addressed prior to the selection of the Final Cleanup Alternative. These concerns are listed below:

- Effectiveness in Preventing Exposures - The institutional controls, common to all the cleanup alternatives (except "No Action"), play a significant role in the protection of human health in East Helena and the surrounding area. Considering the health protectiveness of the cleanup alternatives rely heavily on the effectiveness of the institutional controls, the BOH would like information regarding their anticipated effectiveness prior to the selection of the Final Cleanup Alternative. Such information should be gathered from other hazardous waste sites where the selected remedy relied heavily on institutional controls. In addition, an approach should be defined to monitor or measure the effectiveness of the institutional controls in East Helena over time. For example, will future blood lead data be the only measure of effectiveness, or will additional data, such as in-home environmental assessments, community interviews, or enforcements, also measure/monitor effectiveness?

- Content – To effectively develop and implement institutional controls, the BOH requires more information regarding their content. EPA should provide a list of recommendations and ideas that have been used successfully at other hazardous waste sites, as well as operational/management ideas. In addition, the BOH requests examples of the specific legal language used to establish "successful" institutional controls at other sites.

- Enforceability – The BOH has concerns with enforceability of the institutional controls. Prevention of certain potential exposures does not appear to be enforceable, such as exposures within residences (e.g., attic dust) and the long-term Best Management Practices (BMP) for agricultural areas. Prior to the selection of the Final Cleanup Alternative, EPA must provide examples of specific mechanisms to be included in the Institutional Controls for such exposures.

- Funding – The City-County Health Department does not have the financial resources to develop, implement, manage, and enforce the institutional controls. As such, the BOH will accept responsibility for the institutional controls only if sufficient funding will be available. The BOH health requests that the EPA provide detailed information and justification regarding the development of the cost estimates for the institutional controls, as well as the proposed funding mechanisms. Specifically, the BOH would like to ensure the following types of services are included in the cost estimates.

    - Soil sampling and analysis
    - Blood lead monitoring
    - In-home environmental assessments and contaminant abatement
    - Management of agricultural areas – the City-County Health Department does not have expertise in agricultural BMPs, nor does Lewis & Clark County have a department specializing in agricultural practices.
    - Air quality monitoring to evaluate the effectiveness of the agricultural BMPs
    - Expansion of the community education programs to include families not residing in East Helena, but whose children attend school or daycare in East Helena.
    - Free permits – EPA emphasized free permits, presumably to ensure that homeowners and landowners are not unduly burdened by the institutional controls. The permits may have a significant cost to the City-County Health

Department through permit preparation, review and administration; soil testing; and in-home environmental assessments.

- Contingencies – the cost estimates should allow for the possibility that the cost estimates will not be sufficient to adequately manage the Institutional Controls.

2.4.4 Community Acceptance

The Proposed Plan indicates (p. 25) that developers or land owners that wish to change the use of undeveloped lands must meet all the requirements and specifications for the new use and will bear all associated cleanup costs. This element of the Preferred Cleanup Alternative could have significant economic impacts to the community of East Helena. Therefore, the EPA should provide justification for transferring the cost of cleanup of undeveloped lands from the PRP to the landowner and/or developer. EPA should also provide a legal analysis regarding liability under the Comprehensive, Environmental Response, Compensation and Liability Act (CERCLA) describing how the liability is transferred from the PRP to the landowner/developer.

3.0 SPECIFIC COMMENTS

Page 1, 1st column, paragraph 3 – The proposed plan applies only to existing residential soils and offers recommendations only for undeveloped lands. Will undeveloped lands be monitored only through institutional controls after the Record of Decision (ROD) is approved?

Page 1, 2nd column, last bullet – Please provide information regarding how Burlington Northern and Montana Rail Link will be involved in the railroad right-of-way cleanup.

Page 2, 2nd column, paragraph 2 – Please provide a description of EPA's 5-year review. Who will perform the 5-year review? Will random sampling be conducted? Will an evaluation plan or protocol be developed and in place? How will it be determined whether the cleanup was sufficient or whether the institutional controls are working? What if problems are found?

Page 5, Figure 1 - Please provide a map showing the East Helena City Boundary, lands owned by ASARCO, the railroads and other major landowners.

Page 5 – Please provide a figure depicting the extent of arsenic contamination in East Helena (similar to Figure 1 that depicts the extent of lead contamination).

Page 10, 2nd column, paragraph 2 – Who is the risk management team? The proposed plan states, "All of the *alternative input values* utilized were specifically requested by the *risk management team* and are deemed to be scientifically valid." Please identify the composing members of the risk management team.

Page 16, 1st column, last paragraph – Please provide the reference for the recent risk-calculations establishing risk-based concentrations of lead and arsenic in soils for undeveloped lands for workers and recreationists.

Page 17, 2nd column, first complete paragraph, under the 1R alternative – Please describe the "other sources" of funding that may be available? Who would be responsible for securing those sources of funding?

Page 19, The BOH requests that the EPA state the local government will only accept the responsibility of Institutional Controls as long as there is funding in place.

Page 19, 2nd column, Paragraph 1 - Why are yard averages or property averages being used versus the protocol in place which uses individual quadrant analysis? Does EPA propose changing the protocol to yard averages?

Page 21, 2nd column, Paragraph 1 – this states "...it is simply not practical to eliminate all sources of and pathways for lead exposure from this large site (the rodeo grounds)." EPA provides no substantiation for this conclusion.

Page 21, 2nd Column, Paragraph 2 - Who will have the ultimate long-term responsibility for the management, operation, and monitoring of the soil repository at the East Fields? Who covers the cost of this? Will other soil repository areas be needed for the cleanup? Please provide more details regarding this topic and the area.

Page 26 and 27 – The Proposed Plan indicates that alternative 2R and 3R are "by all known measures" equally protective. Please explain further. What are "all known measures"?

Page 29, Community Acceptance, Paragraph 2. This paragraph is incorrect. While the BOH does support protection of human health, we do not link human health protection to such criterion as "at the most reasonable cost." The BOH requests this paragraph be omitted.

4.0 REFERENCES

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ADMINISTRATIVE RECORD

DEPARTMENT OF PUBLIC HEALTH AND HUMAN SERVICES

BRIAN SCHWEITZER
GOVERNOR

JOAN MILES
DIRECTOR

STATE OF MONTANA

www.dphhs.mt.gov

Site # EH File 1.07.06.00
Confidential: Yes ____ No ✓
Admin. Record: Yes ✓ No ____
Key Words/Comments: Comments on proposed plan from the Montana State epidemiologist
APR 16 2007
MONTANA OFFICE

April 16, 2007

Scott Brown
US EPA, Federal Building
10 West 15th Street
Suite 3200
Helena, MT 59626

Dear Mr. Brown:

I am writing in response to "Plans for a final cleanup of East Helena's residential soils and undeveloped lands" which EPA announced in January 2007 for the East Helena Superfund Site (Operable Unit No. 2). My comments concern the parts of the plan that, in my view, are the most important for protecting the public's health with regard to exposure to lead.

While it would be ideal to eliminate lead and other heavy metals from areas both exterior (e.g., soil) and interior (e.g., dust or old paint) to living units, it is not feasible to achieve this ideal. In contrast, the plan proposed by the EPA appears to be feasible. The plan includes cleanup of a residential yard in which any quadrant has soil with lead concentration exceeding 1000 ppm. Cleanup in those yards would include all areas with lead concentrations exceeding 500 ppm.

I agree this reduction in soil lead concentration is desirable. However, because it is impossible to remove all lead-bearing soils, there will continue to be risk of ambient exposure in people's living environments from contaminated dust (not to mention lead-based paint), and continuing efforts to minimize those exposures will be important. As long as any lead concentration is detectable in interior dust, the following parts of the EPA proposed plan are essential for protecting the public health:

A. Continue the existing East Helena Lead Education and Abatement Program, and
B. Establish institutional controls that prevent disturbances of contaminated soil that would remain in East Helena, and prevent human exposure to interior household dust during renovation or demolition of existing housing stock in East Helena.

Achieving these two parts of the EPA proposed plan must have the highest possible priority. To the extent funds are available to implement and evaluate implementation of the proposed plan, these funds need to be preferentially targeted to these two components of the plan.

Sincerely,

Steven D. Helgerson

Steven D. Helgerson, MD, MPH
State Medical Officer

cc: Melanie Reynolds, MPH
Health Officer, Lewis and Clark County Health Department

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ADMINISTRATIVE RECORD

ENVIRONMENTAL PROTECTION AGENCY
APR 16 2007
MONTANA OFFICE

Montana Department of
ENVIRONMENTAL QUALITY

Brian Schweitzer, Governor

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P&E
Site # EH File 1.07.06.00
Confidential: Yes ____ No ✓
Admin. Record: Yes ✓ No ____
Key Words/Comments: Comments on proposed plan

April 12, 2007

John Wardell
U. S. Environmental Protection Agency
Region VIII, Montana Office
10 West 15th Street, Suite 3200
Helena, MT 59626

SUBJECT: Department of Environmental Quality Comments on the Proposed Plan, East Helena Superfund Site, Montana.

Dear Mr. Wardell:

Thank you for the opportunity to provide State input on the issued proposed plan received January 11, 2007. DEQ supports EPA in proposing a soil lead action level of 500 ppm for the undeveloped lands proposed for development but would also support the risk-based concentration of 610 ppm throughout the operable unit. DEQ also tentatively supports EPA's proposed recreational and commercial exposure cleanup levels although DEQ needs to review the assumptions, calculations, and risk management basis used to develop these new cleanup levels. DEQ requests that EPA address the following concerns in the Record of Decision:

- Adopt risk-based cleanup levels for lead and arsenic for current and reasonably anticipated residential soils that conform to EPA regulations and guidance.
- Implement the EPA Technical Review Workgroup's recommendations in their February 17, 2006 memo.
- Eliminate the conclusion that the preferred alternative is protective of human health based on blood lead sampling. Also, alter the conclusion that remedy alternatives are equally capable of reducing risks.
- Include interior dust removal in the remedy.
- Identify and evaluate potential institutional controls, as that is the responsibility of EPA, in consultation with the state. The remedy requires institutional controls for soil disturbance, proposed development, and the soils repository. The Record of Decision should include funding mechanisms, development, implementation, and enforcement of institutional controls.

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- Remove the requirement that CERCLA liability shifts from the responsible parties to the property owners and developers.

Following are DEQ's specific comments on the proposed plan that EPA should address through development of the Record of Decision.

1. DEQ supports the following components of the Preferred Alternative:

   - Continuing the existing East Helena Lead Education and Abatement Program (Lead Program) for as long as necessary to help reduce children's exposure to lead.
   - Completing cleanup of streets, alleys, road aprons, irrigation ditches and railroad right-of-way that are adjacent to or within residential areas.
   - Establishing institutional controls to prevent disturbance of soils, prevent exposure to interior dust, and to define land use changes.

   For existing residential yards, DEQ supports continuing with all the sampling and cleanup protocols developed in the past 15 years under the removal action's administrative order on consent, with the exception of the soil lead level needed for a yard to qualify for cleanup. DEQ supports cleanup of all qualifying quadrants or sections of the yard with soil lead concentrations above the risk-based concentration (RBC) of 610 parts per million (ppm). DEQ requests that EPA modify its alternative based on qualifying yard quadrants greater than 610 ppm lead (and associated cost estimate with time frame for implementation) in the Record of Decision, and identify that alternative as a component of the selected remedy.

   Earlier in 2007 DEQ requested the Agency for Toxic Substances and Disease Registry (ATSDR) to evaluate the protectiveness of the proposed soil lead action level of 1,000 ppm compared to the RBC. ATSDR recently informed DEQ that they will complete their evaluation after close of the public comment period. Therefore, DEQ reserves further comment on the proposed action level pending the ATSDR evaluation.

2. DEQ agrees that the Lead Program has been strong and effective with its outreach and education in helping to reduce exposure to lead and arsenic in the past, and acknowledges that the program should continue in the future. However, reducing children's exposure to soils where lead levels remain above the RBC relies on the parent's knowledge and intervention actions. The proposed plan discussed the possibility of "lower awareness of residents, who may revert to behaviors that increase the risks from the remaining lead and arsenic." This possibility exists even with the Lead Education and Abatement Program. Remediating residential soils to the risk-based lead cleanup levels is more protective and effective and has more long-term permanence. Thus, DEQ supports the more protective alternative of removing yard soils with soil lead levels greater than the RBC, thereby

eliminating the unacceptable soil exposure pathway. DEQ proposes the remedial action objective should be to remediate residential yard soils to risk-based lead levels that reduce children's lead exposure. This will reduce the reliance on education.

3. The proposed plan asserts that Alternatives 2R and 3R are "by all known measures" equivalent in terms of overall protection. EPA bases this assertion on the recent blood lead monitoring. However, the blood lead monitoring does not document this protectiveness. Nor is EPA's basis supported by the EPA Superfund Lead-Contaminated Residential Sites Handbook (Lead Sites Handbook August 2003) that states "blood lead studies...should not be used for establishing long-term remedial...cleanup levels at lead sites." In addition, the past blood lead monitoring can not be used as a measure of future protectiveness. The recent (past 10 years) participation in the blood lead monitoring program is not representative with participation of only 25-50% of self-selected individuals. More importantly, the blood lead monitoring results may have also been influenced by awareness and the education efforts and thus blood levels are likely lower than if the current education effort was not effective.

4. The Lead Model Re-Evaluation report shows that lead from residential soils and homes still present a risk of unacceptable lead exposure with soil lead levels above 520 ppm. The Record of Decision should include the Results statement from the report, "Based on the site-specific inputs to the IEUBK model... the value of P10 reaches a value of 5% at a soil concentration of approximately 520 ppm. This value is identified as the site-specific RBC for lead in soil." DEQ accepted the site specific parameters used to calculate this RBC but agreed with EPA's Technical Review Workgroup (TRW) in their recommendation "that there should be no conversion of the model's output to a new [Geometric Mean]." Use of the arithmetic mean produces a RBC of 610 ppm lead (which DEQ has previously accepted as appropriately protective).

5. DEQ supports the Lead Program's environmental assessment approach to assess possible sources of lead exposure routes within a home and then provide education on how to reduce exposure. However, the selected remedy should proactively reduce unacceptable exposure, including unacceptable exposure to interior dust, and require removal of dust if there is a complete or potentially complete exposure pathway.

6. The Proposed Plan did not include adequate discussion of anticipated institutional controls (ICs). The Proposed Plan identified Lewis and Clark County as responsible for determining necessary institutional controls. EPA has published a guidance document entitled "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups" (EPA 540-F-00-005, 09/2000). This guidance clearly defines the steps that EPA, not a county or other entity, uses to identify and evaluate the appropriate ICs for a site. DEQ supports the

involvement of local and state governments as well as other affected parties in the ICs decision making process; however, the responsibility of identifying and evaluating potential institutional controls is EPA's, in consultation with the state, and should not be a burden unilaterally placed on the County. ICs should be considered and included in the selected remedy for the Record of Decision. ICs are a critical part of the remedy and the success of the implemented remedy where active response measures are impracticable. Please provide details of anticipated institutional controls, including information regarding costs, enforcement, implementation, funding, etc., in the Record of Decision.

7. The proposed plan states, "Developers or landowners...will bear all associated cleanup costs." The selected remedy should not state that developers and landowners will pay for remediation. Certainly developers and landowners could work out an agreeable arrangement with the Potentially Responsible Parties (PRPs) but specifically identifying liability of developers and landowners is not a component of the remedy. Allocating liability is not part of the remedy; the liability should remain with the PRPs. The Proposed Plan also states, "Undeveloped lands are being developed, and proposed for development, in the vicinity of East Helena." The Record of Decision should address that anticipated land use. The Lead Sites Handbook states that EPA generally will not take CERCLA enforcement actions against an owner of residential property. In addition, the Handbook notes that landowners may qualify under CERCLA for protection from CERCLA liability as a contiguous property owner, bona fide prospective purchaser, or innocent landowner.

8. The proposed plan provided "total costs" in the estimates for cleanup of the railroad right-of-way and water conveying ditches but not for the undeveloped lands. The Record of Decision should include total estimated costs for the undeveloped lands.

9. One of the cleanup alternatives for undeveloped lands in the proposed plan is In-Place Treatment (or tilling). The EPA Lead Sites Handbook explains that tilling is not an acceptable cleanup method for lead soils because it is not a permanent, protective remedy. This is because no lead removal occurs, and adequate mixing of soil is difficult, if not impossible, to achieve. The handbook further states that tilling may increase the volume of soil, which ultimately requires remediation. The Record of Decision needs to be more precise in its discussion of tilling as a remedy.

   DEQ agrees that in limited site-specific situations, such as non-residential surficial contamination, tilling may be appropriate However, tilling failed in the Uttick Subdivision in East Helena. After much effort and numerous tilling passes and subsequent sampling, most soils still contained lead above the negotiated cleanup level and had to be excavated and replaced. This was due to the fluvial deposits in the flood channels which had much higher contaminant levels. The adjacent Dartman Fields would likely also not be amenable to tilling due to

similar fluvial deposits. Also, the rocky sub-soils in the undeveloped land surrounding East Helena may make deep tilling difficult to implement.

The Record of Decision needs to define the sampling protocols and the decision criteria for suitability of tilling.

10. The Record of Decision should include a discussion on the long-term management and institutional controls for the East Fields soil repository. This may include a cap, dust control, weed control, BAMPs, inspections, deed restrictions, and/or groundwater monitoring.

11. The Record of Decision should require cleanup of the portions of the rodeo grounds with soil levels above the recreational cleanup level of 2,800 ppm lead and 1,000 ppm arsenic.

12. The Record of Decision should include a discussion of contingencies if the remedy fails to be protective. Also, it should describe the contingencies if the city or county can't / doesn't want to implement or, if it implements, but at some point can't / doesn't want to continue the institutional controls.

13. The preferred alternative in the proposed plan involves continuing with cleanup criteria established through the removal actions. The Record of Decision should include a discussion to notify the reader as to the different goals and objectives of a removal action compared to a remedial action. As set forth in the NCP, 55 Fed. Reg. 8666, 8695, "Although all removals must be protective of human health and the environment within their defined objectives, removals are distinct from remedial actions in that they may mitigate or stabilize the threat rather than comprehensively addressing all threats at a site."

14. Please provide the assumptions, risk calculations, and risk management basis used to determine the newly proposed soil cleanup levels for commercial and recreational land use. DEQ requests copies of this documentation for review and comment as soon as possible. Also, the Record of Decision should make clear that the soil cleanup levels for commercial and recreational land use apply to the entire operable unit and not just undeveloped lands.

15. The calculated cancer risk of 1.499E-04 exceeds EPA's "acceptable" risk level of 1.0E-04, as well as DEQ's "acceptable" risk of 1.0E-05. The correct application using 1.0E-04 in the calculation gives an arsenic PRG of 117 ppm. The Record of Decision should list the arsenic PRG of 117 ppm.

16. The remedy should require that residential soils with arsenic greater than the action level should qualify a yard for cleanup.

17. EPA's Technical Review Workgroup's (TRW) recommendation for running the lead model (IEUBK) is to use default values unless representative site-specific

data appropriate to the variable in question are available. It is inappropriate to use "regional data" if site-specific input parameters cannot be calculated. Thus, the Record of Decision should not reference or use regional data in the text or in the tables. EPA Region 8 chose the parameters, many of which DEQ and the EPA Technical Review Workgroup (February 17, 2006, memo) consider to be invalid or unrepresentative, and not equally plausible.

18. The NCP, at 40 CFR 300.430(f)(2)(iii), requires at a minimum that the proposed plan provide a summary of any formal comments received from the support agency. The proposed plan did not include that summary but stated, "After consideration of public and local government concerns and comments, MDEQ will present formal comments to EPA." DEQ would have appreciated its own input into the Proposed Plan.

DEQ is available to meet with EPA to discuss these issues and concerns. I look forward to its continued meaningful and substantial participation by the department in development of the ROD, and to working together for the best remedy. Please feel free to contact me with any questions or concerns. I can be reached at 406-841-5001.

Sincerely,

Sandi Olsen

Sandi Olsen
Division Administrator
Remediation Division

cc: Richard Opper
Vic Andersen
Daryl Reed
Mary Capdeville, DOJ
Jill Cohenour, State Representative House District 78
Melanie Reynolds, Lewis & Clark County

ADMINISTRATIVE RECORD

APR 1 6 2007
MONTANA OFFICE

P.O. Box 6695
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P&E
Site # EH Site 1.07.06.00
Confidential NO
Admin. Record Yes
Key Words/Comm. Comments on proposed plan

April 13, 2007

USEPA, Federal Building
ATTN: Scott Brown
10 West 15th Street, Suite 3200
Helena, MT 59626

Re: Comments to EPA's January 2007 Proposed Plan for Final Cleanup of East Helena's Residential Soils and Undeveloped Lands (Operable Unit No. 2)

Dear EPA:

We live outside of East Helena proper, near the Eastgate community water tower. Our residence consists of 17 acres, 10 of which are undeveloped and are subdividable into two 5-acre parcels.

In spring 2005, prior to purchasing our residence, we contacted the EPA, the Lewis and Clark County Health Department and the Montana Department of Environmental Quality to inquire whether the residence was part of the East Helena superfund site and whether any cleanup would be necessary at the residence. We were told that no cleanup level for lead had yet been established by EPA, but that it would likely be in the neighborhood of 1,000 ppm. We were provided copies of lead sampling results taken for our residence, all of which were near our house. We requested copies of sampling results done near our neighbors' homes, but were told those results could not be released to us. The highest sampling result for our residence was between 500 ppm and 1,000 ppm; most were below 400 ppm. We were also told us that based on the sampling results of our residence, our property was not part of the superfund site and was not targeted for cleanup by the EPA.

We recently reviewed the EPA's proposed plan for the East Helena Superfund Site (Operable Unit 2) and were quite surprised to see that, contrary to what we were told, our residence appears to be included in the East Helena superfund site boundary. We are also deeply troubled by what we read in the proposed plan. Our major concerns are set forth below.

- The proposed plan states that "landowners seeking to change the use of undeveloped land . . . will bear all associated cleanup costs. " Such a requirement flies in the face of both CERCLA and EPA's own internal guidance. Under CERCLA, innocent landowners such as ourselves, bona fide prospective purchasers, and contiguous property owners are conditionally exempt from any cleanup casts associated with contamination in superfund sites. Moreover, the EPA Superfund Lead-Contaminated Residential Sites Handbook (August 2003) plainly states, "EPA . . . generally will not take CERCLA enforcement actions against an owner of residential property unless the residential homeowner's activities lead to a release or threat of release of

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hazardous substances resulting in the taking of a response action at a site." *See* Handbook at pg. 62. EPA's proposed plan essentially constitutes an enforcement action against residential landowners and attempts to circumvent both the sprit and black letter law of CERCLA, as well as the EPA's own guidance, by trying to hold residential landowners liable for the cleanup of contaminated areas. Such an attempt is not only inappropriate, but likely illegal.

- The EPA's selection of lead levels have no apparent rational basis, and as applied, are not protective of human health. The EPA has failed to provide any legitimate basis for requiring a 500 ppm lead cleanup level for undeveloped lands, all the while allowing developed residences to contain levels of lead between 500 ppm and 1000 ppm. Either 1,000 ppm is protective or 500 ppm is protective. If they both are equally protective or the difference is negligible (as is suggested on page 12 of the plan), then there is no rational basis for the undeveloped land lead cleanup level to be 500 ppm. If 1,000 ppm is not protective, then every property exceeding 500 ppm should be cleaned up by the EPA to 500 ppm.

Furthermore, under the plan, neighbor A could have 999 ppm of lead on his developed property and the EPA would require no cleanup. Neighbor B, right next door, could have 1,001 ppm lead on his developed property (or 501 ppm on his undeveloped property) and the property would be required to be cleaned up to 500 ppm. This would result in a patchwork of properties, some meeting a protective level of 500 ppm and others having lead levels almost twice as high. Indeed, under the existing plan, should we develop our undeveloped land and have to cleanup the property to 500 ppm, it would be contiguous to our house area, where the lead levels exceed 500 ppm. Such results clearly cannot be deemed protective.

We additionally note that if the lead cleanup levels were based on blood lead study data as the plan suggests, such a basis is contradicted by EPA's own guidance. *See* EPA Superfund Lead-Contaminated Residential Sites Handbook (August 2003) at pg. B-4 ("OSWER recommends that blood lead studies not be used for establishing long-term remedial . . . cleanup levels at lead sites.")

- The proposed plan fails to properly identify anticipated institutional controls and appears to attempt to place at least partial responsibility for developing those controls in the hands of local government. As EPA's own guidance makes clear, developing appropriate institutional controls is the EPA's responsibility, not local government's. *See* Institutional Controls: A Site Manager's Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups" (EPA 540-F-00-005, 09/2000).

- The proposed plan fails to include any cost estimate for future development of undeveloped residential areas similar to our property.

- Capping undeveloped property is not a feasible final remedy alternative and should not have been included as if it were one. Any cap put in place will only be disturbed when development occurs. At the most, capping is a temporary, short-term remedy.

- Recent studies demonstrate that detrimental lead effects are not limited to children under the age of 7, but in fact, can be seen in children up to the age of 18. Nothing in the proposed plan appears to recognize that fact.

- The plan suggests EPA has no knowledge of the actual extent of contamination on undeveloped property. We therefore question the accuracy of the boundary map provided in the plan. Moreover, it is premature to be proposing a final plan for a superfund site if, in fact, the EPA does not even know the extent of the contamination because, for instance, if that is indeed the case, the cost estimates used for alternative comparisons cannot possibly be accurate.

Sincerely,

Laura and Brian Vachowski

Laura and Brian Vachowski

ADMINISTRATIVE RECORD P4E
Site # EH File 1.07.06.00
Confidential: Yes ____ No ✓
Admin. Record: Yes ✓ No ____
Key Words/Comments: comments on proposed plan

APR 16 2007
MONTANA OFFICE

April 13, 2007

Scott Brown
U.S. Environmental Protection Agency
Region VIII, Montana Office
10 West 15th Street, Suite 3200
Helena, MT 59626

Subject: Comments on the Proposed Plan for Residential Soils and Undeveloped Lands at the East Helena Superfund Site

Dear Mr. Brown:

I appreciate the opportunity to comment on the proposed plan for the East Helena Superfund Site. While I do not have much background in this type of issue, I do have one major concern about the contamination issues in my community. It seems to me that the Proposed Plan places a lot of emphasis on the East Helena Lead Abatement Program to continue to provide information to the public about the risks of lead and ways to prevent exposure to lead, particularly since the cleanup level is higher than that recommended by the state agency, DEQ. I also understand that this program is the one that conducts the blood screenings to make sure our children have not been exposed to unsafe levels of lead. The problem with this scenario is that this program is not all that well known or advertised. I feel that I can say this with certainty because I have lived in this community for nearly five years and have only seen one postcard having anything to do with the Lead Abatement Program. The troubling part is that I have a four year old son who plays outside in our yard on an almost daily basis and another baby on the way. From what I have been told, my particular neighborhood may be a lesser concern than others, as it is farther away from the source. However, as I mentioned before, I have not received any real information about risks to my children, nor have I been made aware that such information was available. I consider myself to be a well educated and concerned parent and worry that if I was not aware of the risks and/or available information sources, there must be a lot of other parents in the community who have no idea about this issue either.

It seems to me that it may be more protective to use a lower cleanup level to ensure that these children are protected. This is particularly true given that the Lead Abatement Program is not necessarily accomplishing all that it attempts to. While the program seems like a great idea, it wouldn't need to be relied on to such an extent if more cleanup work was done. I encourage EPA to use a lower cleanup level and ensure protection of the children of East Helena.

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Thank you for consideration of my comments.

2675 Cody Drive
East Helena, MT

ADMINISTRATIVE RECORD

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EH File 1.07.06.00
Yes ____ No ✓
Yes ✓ No ____
Comments: Comments on proposed plan

April 13, 2007

Scott Brown
U.S. Environmental Protection Agency
Region VIII, Montana Office
10 West 15th Street, Suite 3200
Helena, MT 59626

Subject: Comments on the Proposed Plan for Residential Soils and Undeveloped Lands at the East Helena Superfund Site

Dear Mr. Brown:

Thank you for the opportunity to provide input on the above-referenced Proposed Plan. As a resident of the East Helena community and the mother of a toddler (with a baby on the way), I think it is important to take note of this issue. I have thoroughly reviewed the Proposed Plan and have some major issues with the chosen alternative for residential yards. I also believe there are issues with the chosen alternative for undeveloped land, but as it has less impact on my family, I will not provide many comments associated with that portion of the Proposed Plan.

Overall, I appreciate that EPA has taken the time and effort to ensure that Asarco is not able to ignore its responsibility to cleanup the mess it has left in the East Helena area. That being said, I feel that EPA is attempting to take the easy way out with its proposed cleanups of both residential yards and undeveloped lands. As a person who deals with these types of issues in my job, I feel somewhat disappointed that EPA has chosen to pursue a remedy that I believe is not as protective as it should be, and is assuring the public that the basis for the chosen remedy is sound science. It is my opinion that EPA has chosen to ignore science altogether in hopes of pushing something through that will be quick, easy, and relatively inexpensive (in the grand scheme of things), at the potential expense of human health.

Specifically, I have the following comments that I would like to see taken into consideration in EPA's Record of Decision:

1. EPA chose to input "regional data" from the Butte and Anaconda Superfund sites in its IEUBK model to come up with a site-specific risk-based cleanup level for East Helena. Data from another Superfund site is not specific to East Helena and therefore is inappropriate to use in the model. Default values should be input for all variables for which site-specific data is not available.

2. The lead model resulted in a risk-based cleanup level of 520 ppm lead in soils. It appears that EPA is completely disregarding the model in choosing a preferred remedy that has a "trigger" value of 1,000 ppm. If EPA feels it is important to cleanup soils to 500 ppm in soils that are "triggered" by a 1,000 ppm concentration, then why not use a "trigger" of something closer to 500 ppm in the first place?

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3. The statement in the proposed plan that "the model derived predictions are but one aspect, of several equal or more important aspects, that were considered…" is interesting. It appears that the "more important" aspects that were considered are the blood lead studies conducted on children in the East Helena area. The EPA Superfund Lead-Contaminated Sites Handbook (August 2003) states that blood lead studies should not be used for establishing cleanup levels. However, it appears that EPA is giving these studies (which are conducted on a completely voluntary basis by people who choose to bring their children in to be tested, and are therefore not representative of the population of the area) more importance than the lead model, which is used across the nation to calculate risk-based cleanup levels.

4. The two alternatives that require action be taken are completely different and cannot be accurately compared. The action alternative that was not selected is based on a yard average, which in itself is completely inappropriate, as EPA's lead handbook referred to in the previous comment specifies that yard averages should not be used. Additionally, the costs for this alternative are going to be much higher, as the soil removal will inevitably be much larger given that the entire yard would have to be removed. It would be more useful, and more accurate, to simply change the cleanup level and leave all other aspects of the remedy the same. I expect that this would result in a much lower dollar figure for overall cleanup costs. I would like to see EPA consider what the costs would be for cleanup based on the lower cleanup level from the model (520 ppm) leaving all other aspects of the chosen remedy the same.

5. The idea that landowners who currently have undeveloped land should be responsible for paying cleanup costs should they decide to develop the property is outrageous. Not only that, but those who currently have a home on property that may later be subdivided may end up in a situation of having to cleanup their undeveloped property to a more stringent level than where they currently live. Again, this brings up the issue of the cleanup level. If EPA feels that 500 ppm is protective for future development, then why should those of us who already live in the East Helena be less important?

I understand that something needs to be done to cleanup the East Helena Superfund Site and that Asarco is in bankruptcy and money is an issue. I also understand that the East Helena City Council would like to move forward with cleanup to help expand the economy of the town. However, I think that more emphasis must be placed on the risks to the people (specifically the children) of the community and ensuring that the cleanup is done correctly the first time. That is really the most important thing.

I appreciate your consideration of my comments and look forward to the future cleanup of my community. I hope that EPA will choose to do the right thing and make sure that the people of East Helena are adequately protected.

Sincerely,

Moriah Bucy

Site # EH File 1070600 P2R
Confidential: Yes ____ No ✓
Admin. Record: Yes ✓ No ____
Key Words/Comments: Public comment

ENVIRONMENTAL PROTECTION AGENCY
MAR 13 2007
MONTANA OFFICE

ADMINISTRATIVE RECORD

COMMENT FOR EPA-EAST HELENA LEAD-SOIL CLEANUP PLANS
March 12, 2007

I am strongly **opposed** to the "preferred cleanup alternative (2R)" recommended by the EPA" and I favor Alternative R3 for the following reasons:

1. The State MDEQ has raised sufficient concerns and questions over the 1000 ppm limit as opposed to the 500 ppm in that lead blood level tests in children are based on a biased sampling of participants rather than a random sampling. The use of biased sampling is not scientific and does not lead to reliable test results.

2. The EPA by their own analysis has presented a different standard for "Clean up Goals for Undeveloped Lands" and is setting the requirement for remediation of undeveloped/ residential-use land at a maximum level of 500 ppm not 1000 ppm. These two standards are in contradiction with one another.

The difference between the two standards (residential versus undeveloped/future residential) appears to be related to availability of funding for cleanup. In other words, there is just enough money available in the ASARCO reclamation fund to implement 2R and nowhere near enough to support 3R. In the case of undeveloped lands, however, since funding will likely be paid out of the developer's pockets, the level for remediation is set at 500 ppm. This reasoning ignores the actual health issues.

The plan that the EPA implements should require a uniform standard regardless of whether it involves developed or undeveloped land. Implementation of the 500 ppm level (i.e. 3R) is the safest plan and would stand the test of time. ASARCO should be required by the EPA to meet this standard (just like private developers will be required). Because of ASARCO'S current shaky financial condition they may not be around to resolve recurring issues in the future. They need to be held accountable now while there is still opportunity!

Submitted by:
Sally K. Nyland
203 North Prickley Pear Avenue
East Helena, MT 59635

Sally K. Nyland

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ADMINISTRATIVE RECORD

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April 4, 2007

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VIA FEDERAL EXPRESS

Mr. Scott Brown
United States Environmental Protection Agency
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10 West 15th Street, Suite 3200
Helena, MT 59626

Re: ASARCO LLC Comments
Proposed Plan For Final Cleanup of East Helena's Residential Soils and Undeveloped Land (OU2)

Dear Mr. Brown:

ASARCO LLC ("ASARCO") submits the following comments regarding the United States Environmental Protection Agency's ("EPA's") Proposed Plan for soil remediation in Operable Unit 2 of the East Helena Super Fund Site ("Proposed Plan"). As outlined in more detail below, ASARCO generally supports EPA's selected cleanup alternatives both for residential and undeveloped areas.

A. Residential Soils

1. Alternative 2R is an Effective Choice For Addressing Residential Soils.

ASARCO agrees with EPA's selection of Alternative 2R to address residential soils in East Helena. As noted in the EPA's announcement of the Proposed Plan (the "Announcement"), Alternative 2R "consist[s] of completing the residential soil cleanup according to protocols that are currently in place for the ongoing removal action." Announcement at 17. Implementation of these protocols has significantly lowered children's blood-lead levels in East Helena.

As noted by EPA, not a single child sampled since 2001 has had a blood-lead level that exceeded 10 ug/dl and 98% of the these children have had blood-lead levels of 4 ug/dl or less. Announcement at 12. To date, the program has surpassed all goals established locally, as well as national goals for lead sites. *See id.* at 14. Indeed, average children's blood-lead levels in East Helena are below the national average. *See id.* at 16. These data are compelling proof that the protocols upon which Alternative 2R is based are proven to be an effective means of protecting human health and the environment in East Helena.

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2. Alternative 2R is Superior to Alternative 3R as the Most Cost-Effective Alternative.

In choosing removal alternatives, EPA must select a remedy that is consistent with CERCLA and the nine National Contingency Plan ("NCP")[1] criteria. Of the nine criteria, two are viewed as threshold criteria - protection of human health and the environment and compliance with applicable or appropriate and relevant requirements ("ARARs"). *See* EPA, *The Role of Cost in the Super Fund Remedy Selection Process*, OSWER 9200.3-23, 4-5 (Sept. 1996) ("*1996 Cost Guidance*"). Alternatives that meet these threshold criteria are to be compared to one another based upon the remaining seven criteria. *Id.* As noted by EPA, Alternative 2R and 3R are functionally equivalent as to the threshold criteria. *See* Announcement at 26-7.[2] Of the remaining seven criteria, cost-effectiveness is the one that most distinguishes Alternative 2R from Alternative 3R.

EPA estimates that Alternative 3R will be almost four times as expensive to implement as Alternative 2R - $38 million versus $10 million[3]. As previously noted, Alternative 3R does not provide any comparative advantage as to protection of human health and the environment or compliance with ARARs. Accordingly, this cost discrepancy alone is enough to warrant adoption of Alternative 2R as the appreciably more cost-effective remedy.

The selection of the most cost-effective remedy among various options - all being generally equivalent in terms of protection of public health and the environment - has long been a central tenet of CERCLA. CERCLA dictates that EPA "shall select appropriate remedial actions determined to be necessary to be carried out under [CERCLA] which are in accordance with the section and, to the extent practicable, the national contingency plan, and *which provide cost-effective response*." 42 U.S.C. § 9621(a) (emphasis added). Moreover, CERCLA emphasizes that when selecting a remedy, EPA "shall select a remedial action...*that is cost effective*." *Id.* § 9621(b)(1) (emphasis added). In implementing this cost-effectiveness mandate, EPA has emphasized that gross discrepancies in relative costs of equally protective alternatives are a sound bases upon which to eliminate an alternative. *See* 40 C.F.R. § 300.430(e)(7)(ii) ("costs that are grossly excessive compared to the overall effectiveness of alternatives may be considered as one or several factors used to *eliminate* alternatives.") (emphasis added). As such,

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[1] The nine NCP criteria are (1) overall protection of human health and the environment; (2) compliance with applicable or relevant and appropriate requirements; (3) long-term effectiveness and permanence; (4) reduction of toxicity, mobility, or volume through treatment; (5) short-term efficiency; (6) implentability; (7) cost; (8) state acceptance; and (9) community acceptance.

[2] ASARCO agrees with EPA's conclusion regarding the lack of any statistical differences between child blood-lead levels in areas with soil leads in the 500 - 1000 ppm range and these with soil leads off less that 500 ppm. Reliance on such "real world" data is an appropriate way of measuring risk and setting action and cleanup levels at residential lead sites. *See* EPA, *Clarification to the 1994 Revised Interim Soil Lead Guidance for CERCLA sites and RCRA Corrective Action Facilities*, OSWER 9200.4-27P, 2-3 (1998).

[3] ASARCO takes no position as to whether these figures accurately reflect an appropriate estimate of the costs of implementing the identified remedies except to note that Alternative 3R would obviously cost far more to implement than would Alternative 2R.

ASARCO believes that EPA's selection of Alternative 2R is on all fours with the requirements of CERCLA and the NCP.

3. Community Acceptance Strongly Favors Adopting Alternative 2R Instead of Alternative 3R.

As noted by EPA, key constituencies including the East Helena City Council and the Lewis and Clark City Council Board of Health have expressed support for Alternative 2R. *See* Announcement at 29. As a member of the East Helena community, ASARCO supports the adoption of Alternative 2R. Moreover, judging by the comments made by various citizens in public meetings concerning the adoption of this Proposed Plan, the vast majority of local citizens in East Helena support the adoption of Alternative 2R. Indeed, many of the most vociferous objections voiced at these meetings were from citizens concerned that EPA would implement Alternative 3R and needlessly inconvenience the people in East Helena with an unnecessary program of more extensive remediation.

B. Undeveloped Land

For the same reasons outlined above, ASARCO agrees with EPA's selection of Alternative 4U to address undeveloped lands in East Helena.[4]

C. Conclusion

In light of the foregoing, ASARCO respectfully urges that EPA formally adopt Alternative 2R as the preferred alternative for residential soils and Alternative 4U as the preferred alternative for undeveloped land at the East Helena Site. We appreciate the opportunity to submit these comments and would welcome a chance to discuss these alternatives with EPA at a convenient time.

Respectfully submitted,

BAKER BOTTS, LLP

By: J. Scott Janoe

JSJ:138

cc: Tom Aldrich
J. Chris Pfahl

[4] ASARCO takes no position as to whether these figures accurately reflect an appropriate estimate of the costs of implementing the identified remedies.

SUPPLEMENTAL COMMENTS

1 - Lewis and Clark City-County Board of Health Questions, EPA's Responses and Supplemental Comments

2- Letter of Support from the City of East Helena and EPA's Response

3- Montana Department of Environmental Quality's Letter of Non-Concurrence

Site # EH File 1.07.06.00 P&E
Confidential: Yes ____ No ✓
Admin. Record: Yes ✓ No ____
Key Words/Comments: re: questions raised by Health Board

ADMINISTRATIVE RECORD

Scott Brown/MO/R8/USEPA/US
02/09/2007 03:44 PM

To Melanie Reynolds <mreynolds@co.lewis-clark.mt.us>
cc Bill Brattin <brattin@syrres.com>, Jan Williams <janwilliams@co.lewis-clark.mt.us>, John Wardell/MO/R8/USEPA/US@EPA, Julie
bcc
Subject Re: Questions for EPA's toxicologists

Thanks, Melanie. Please let us know if additional questions arise. John Wardell and I have requested technical/toxicological support from Dr. Griffin and Dr. Brattin regarding these and other questions.
Melanie Reynolds <mreynolds@co.lewis-clark.mt.us>

Melanie Reynolds <mreynolds@co.lewis-clark.mt.us>
02/08/2007 04:02 PM

To Jan Williams <janwilliams@co.lewis-clark.mt.us>, Kathy Moore <kmoore@co.lewis-clark.mt.us>, Scott Brown/MO/R8/USEPA/US@EPA
cc Julie DalSoglio/MO/R8/USEPA/US@EPA, Susan Griffin/EPR/R8/USEPA/US@EPA, John Wardell/MO/R8/USEPA/US@EPA, Bill Brattin <brattin@syrres.com>
Subject Re: Questions for EPA's toxicologists

Hi Scott:

Yes, we would appreciate it if you would forward these questions to the toxicologists for their responses. I am working with the board of health to see if they have some additional questions that they would like to have answered.

Thanks again for your presentation last week.

Melanie

Melanie Reynolds, M.P.H.
Health Officer
Lewis and Clark City-County Health Dept.
1930 Ninth Ave
Helena MT 59601
(406) 457-8910 (phone)
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>>> <Brown.Scott@epamail.epa.gov> 2/2/2007 4:25 PM >>>
Melanie, Kathy and Jan: Below are the questions that were posed during
last evening's meeting with the Health Board, which John Wardell and I offered to forward on to EPA's toxicologists. I took special note of the questions last night, to the best of my recollection; however, I would appreciate your review and concurrence that the Board members' questions are as accurately portrayed as possible.

1. In light of evidence that children may be affected by blood lead levels as low as 4 or 5 ug/dl, and evidence that any level of lead is unhealthy for developing children, "why did the EPA and CDC not lower

1070600
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the level [of concern] below 10 micrograms [lead per deciliter blood]?"

2. "Won't the level [of concern] be lowered in the future? What if the level is lowered to 5 [micrograms per deciliter] sometime in the future?"

3. "Is it accurate that the model output for East Helena is 520 ppm?" [Clarification added: This question arose during the discussion, I assumed, in response to Daryl Reed's statements that (a) the model output specific for East Helena is 520 ppm and (b) the EPA's most recent guidance on setting cleanup levels "at sites like East Helena, says to use the model."]

4. "Why are the action levels at several other sites, like the Vasquez Boulevard site near Denver, 400?"

5. What percentage of [East Helena] children participate in blood lead screenings and is that enough? [Clarification added: This two-part question arose during discussion of (a) how many children participate each year, (b) how the numbers of participants vary each year, and (c) whether or not children in East Helena are still "elevated." An important corollary question should be: Are the East Helena blood lead data representative and useable?]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
FEDERAL BUILDING, 10 W. 15th STREET, SUITE 3200
HELENA, MONTANA 59626

Ref: 8MO March 13, 2007

Ms. Melanie Reynolds, Health Officer
Lewis and Clark City-County Department of Health
316 North Park
Helena, MT 59623

Dear Melanie:

Enclosed are responses to questions posed by Board of Health members during the recent briefing regarding the East Helena proposed final cleanup plan, which required the expertise and assistance of Dr. Susan Griffin, Senior Toxicologist, Region 8, Denver, and Dr. William Brattin, Syracuse Research Corporation, Denver.

Dr. Griffin and Dr. Brattin have researched childhood exposures to lead extensively, both nationally and internationally. They are highly respected experts, particularly in the disciplines of toxicology and risk assessment at mining and smelter sites. Their response to Question 5, regarding the adequacy of blood lead screenings conducted for East Helena children over the past two decades, required considerable coordination with your staff members, Debb Tillo and Jan Williams. EPA appreciates their invaluable input and their thorough knowledge of East Helena-specific data. Moreover, their health evaluations, as well as those of their predecessors, provided insight into the analysis of the contribution of soil lead to blood lead values. The findings of this important analysis support the conclusion that the contribution of residual soil lead concentrations in East Helena- is sufficiently small that the effect cannot be detected.

Based on consideration of participation rates, narrowing bands of statistical uncertainty over time, spatial representativeness, and soil lead representativeness, the findings of the analysis performed in response to the Board's last question support a high level of confidence in the blood lead data generated by the County-administered program. It is concluded that these long-term data are reliable and appropriate for use by risk managers and other health professionals in assessing conditions in East Helena and for setting a protective soil lead cleanup level.

Should the Board members or yourself so desire, Dr. Griffin and Dr. Brattin welcome an opportunity to "meet" via video-conference at your earliest convenience.

Respectfully,

D. Scott Brown, Ph.D.
Montana Office, Region 8

Printed on Recycled Paper

Enclosure: Responses to Questions Posed by Health Board

cc: Hon. Terrie Casey, Mayor, East Helena
Dr. Susan Griffin, Region 8 Senior Toxicologist
Dr. William Brattin, Toxicologist, Syracuse Research Corp.
Dr. John Wardell, Director, 8MO
Julie DalSoglio, Deputy Director, 8MO
Steven Moores, Enforcement Attorney
Dan Strausbaugh, ATSDR
Darryl Reed, MDEQ

USEPA REGION 8 RESPONSES TO QUESTIONS ASKED BY THE CITY-COUNTY HEALTH BOARD

Question 1: In light of evidence that children may be affected by blood lead levels as low as 4 or 5 ug/dL, and evidence that any level of lead is unhealthy for developing children, why did the EPA and CDC not lower the level of concern below 10 ug/dL?

Response:
This question is addressed most clearly by the Centers for Disease Control and Prevention in their 2005 document entitled *Preventing Lead Poisoning in Young Children*. The rationale is as follows:

"In 1991 the CDC recommended lowering the level for individual intervention to 15 ug/dL and implementing community-wide primary lead poisoning prevention activities in areas where many children have blood lead level greater than 10 ug/dL. Some activities, such as taking an environmental history, educating parents about lead, and conducting follow-up blood lead monitoring were suggested for children with blood lead levels greater than 10 ug/dL. However, this level, which was originally intended to trigger communitywide prevention activities, has been misinterpreted frequently as a definitive toxicologic threshold. Evidence exists of adverse health effects in children at blood lead levels less than 10 ug/dL. The available data are based on a sample of fewer than 200 children whose blood lead levels were never above 10 ug/dL and questions remain about the size of the effect. At this time there are valid reasons not to lower the level of concern established in 1991 including the following:

- No effective clinical or public health interventions have been identified that reliably and consistently lower blood lead levels that already are less than 10 ug/dL.
- No one threshold for adverse effects has been demonstrated. Thus the process for establishing a lower level of concern would be arbitrary and no particular blood lead level cutoff can be defended on the basis of the existing data. In addition, establishing a lower level of concern may provide a false sense of safety about the well being of children whose blood lead levels are below the threshold.
- The adverse health effects associated with elevated blood lead levels are subtle. Individual variation in response to exposure and other influences on developmental status, make isolating the effect of lead or predicting the overall magnitude of potential adverse health effects exceedingly difficult.
- Efforts to identify and provide services to children with blood lead levels less than 10 ug/dL may deflect needed resources from children with higher blood lead levels who are likely to benefit most from individualized interventions."

Question 2. Won't the level of concern be lowered in the future? What if the level is lowered to 5 ug/dL sometime in the future?"

Response:
At this time, neither the CDC nor the EPA is proposing to lower the blood lead level of concern below 10 ug/dL. Superfund sites are required by law (CERCLA 121) to undergo reviews every 5 year to determine if the remedy selected for the site remains effective and health protective. If the remedy is no longer health protective because of changes in the blood lead level of concern, then action will be taken to bring the remedy into compliance.

It is important to note, however, that if the CDC or EPA were to lower the level of concern to 4 ug/dL, which was deliberated at length before being rejected for reasons discussed above, 98% of East Helena's children already meet or surpass that level.

Question 3. Is it accurate that the model output for East Helena is 520 ppm?

Response: The IEUBK model is a screening tool whose output depends on the assumptions used as inputs. It is not appropriate to think of any one specific model output as if it were "truth". Using only national average default assumptions, the IEUBK model predicts that a soil action level of 400 ppm would be protective. Using a combination of default assumptions and reliable site-specific information on lead relative bioavailability (RBA) and soil to dust ratios obtained at East Helena, the predicted level is estimated to be 520 ppm. If best scientific information available from other mining and smelting sites in Region 8 were used in addition to the site-specific information from East Helena, the soil action levels could range up to 3000 ppm. The choice between these values is a matter of professional judgment, based on a consideration of the credibility of the alternative input values, as well as other relevant information (e.g., blood lead data, data obtained by in-home environmental assessments, soil sampling protocols, etc.) from the site.

Question 4: Why are the action levels 400 ppm at several other sites, like the Vasquez Boulevard site near Denver?

Response:
Action levels for lead in soil that have been selected for use at residential sites in Region 8 range from 300 ppm to 3,500 ppm. The difference between the action levels selected at differing sites is typically related to the amount of information available at a site. In general, sites with relatively little data (beyond lead levels in soil) may have action levels at or close to the national default level (400 ppm), while sites that have been studied more extensively may have action levels that differ from the national default level. There is no basis for supposing that an action level of 400 ppm is needed at all sites.

EPA's most recent guidance on lead in residential settings (August 2003) reads as follows: "If the proposed clean-up level is outside of the range of 400 ppm to 1,200 ppm lead, then the draft decision document for the site is sent to the [national] Lead Sites Consultation Group (LSCG) for review." This emphasizes that there is no singular lead action level that is considered to be appropriate for use at all sites, and that values in the range of 400-1200 ppm may be reasonable in many cases. The final soil lead cleanup action level deemed by EPA to be more than adequately protective for the East Helena site, which results in an equivalent level of between 650 ppm and 750 ppm lead, is below the mid-point of this range and is supported by extensive site studies.

Question 5: What percentage of East Helena children participate in blood lead screenings, and is that enough?

Response to Part 1: What is the participation rate?

When a blood lead survey is conducted as a single event, the participation rate (PR) is given by:

$$PR = \frac{n}{N}$$

where:

n = Total number of children who participated
N = Total number of children eligible to participate (age 0-6 years)

When a blood survey is part of an on-going program, both the total number of children who have participated and the size of the eligible population (the total number of children who were age 0-6 at any time during the study) will increase each year, so PR is a function of time:

$$PR(t) = \frac{n(t)}{N(t)}$$

The value of n(t) is obtained simply by summing the number of new individuals age 0-6 years who participate each year. For years 1 to T, the value is given by:

$$n(t) = \sum_{i=1}^{T} new(i)$$

The value of N(t) may be estimated by assuming that, for each year of study, the size of the eligible population increases by 1/7 as new children age 0-1 enter the population. Because an equal number of children age 6 will "graduate" from the group each year, the number of

children age 0-6 at any point in time (N0) will remain constant. Based on these assumptions, the values of N(t) is given by:

$$N(t) = N0\left(1 + \frac{T-1}{7}\right)$$

Thus, the participation rate after T years is given by:

$$PR(t) = \frac{\sum_{i=1}^{T} n(i)}{N0\left(1 + \frac{T-1}{7}\right)}$$

The value of N0 for each neighborhood near the site can be estimated from the community survey performed in 2000. The total number of unique participants who have participated from each neighborhood can be calculated from the blood lead database maintained by the County. The results, based on data from 1991 to 2006 (T = 16 years) are shown below:

Neighborhood	N0 (Number of children age 0-6 based on 2000 survey)	Σn(i) (Total children age 0-6 who have participated between 1991-2006)	Participation Rate
Grandview	53	56	34%
East Gate 2	198	160	26%
Sunny Lane + East Gate 1	187	148	25%
La Casa Grande	43	70	52%
Canyon Ferry	68	60	28%
Manlove	19	9	15%
E. Helena + West E. Helena	188	240	41%

As seen, the participation rate varies between neighborhoods, but is generally about 25-50%. Assuming that the blood lead program will continue to operate for some time into the future, and that the number of new children recruited each year will remain similar to current values, these rates will tend to increase over time.

Response to Part 2: Is this participation rate enough?

There are two key factors to consider when deciding if the participation rate is enough to provide a reliable data set for drawing conclusions about blood lead levels in area children: statistical uncertainty and representativeness. Each of these two factors is discussed below.

Statistical Uncertainty

Statistical uncertainty arises whenever a population statistic is estimated from a sample drawn from the population. The magnitude of the statistical uncertainty is related to the size of the sample (large samples result in lower uncertainty) and the degree of variation between the individual values (higher variation results in higher uncertainty).

In this situation, the population statistic of interest is the fraction of all children age 0-6 years that have a blood lead value above 10 ug/dL. For convenience, this statistic is referred to as "P10". The national goal is to ensure that P10 is not larger than 5%. For East Helena, the proposed plan's remedial action goals are designed to ensure that P10 will remain close to zero.

The value of P10 may be estimated in two ways. First, it may be calculated simply by counting the number of children with an observed yearly average blood lead value above 10 ug/dL, and dividing by the total number of children for whom blood lead values were measured. While direct, this approach may yield values that are not accurate, especially when the number of children expected to be above 10 ug/dL is small.

One way to avoid this problem is assume that the data set of blood lead values is characterized by a lognormal distribution, and to estimate the parameters of the distribution (μ and σ) by log-probability plotting, as described by Gilbert (1987). Given the values of μ and σ estimated from the data (these are referred to as $\hat{\mu}$ and $\hat{\sigma}$, respectively), the value of P10 for that data set may be calculated using the following function that is available in Microsoft Excel:

P10 = 1 - LOGNORMDIST(10, $\hat{\mu}$, $\hat{\sigma}$)

Because the values of $\hat{\mu}$ and $\hat{\sigma}$ are derived by fitting a lognormal distribution to the data, both values are uncertain, and hence there is uncertainty in the calculated value of P10. This statistical uncertainty around the fitted value of P10 may be estimated by Monte Carlo simulation, in which the uncertainty in $\hat{\mu}$ and $\hat{\sigma}$ are modeled as follows (Crow and Shimizu 1988):

$$\mu \sim \hat{\mu} - \frac{\hat{\sigma}}{T(n-1)\cdot\sqrt{n}}$$

$$\sigma \sim \sqrt{\frac{(n-1)\cdot\hat{\sigma}^2}{CHISQ(n-1)}}$$

where:

μ = true (but unknown) log-mean of blood lead values

$\hat{\mu}$ = observed log-mean of blood lead values
σ = true (but unknown) value of log-standard deviation of blood lead values
$\hat{\sigma}$ = observed log-standard deviation of blood lead values
T(n-1) = T distribution with n-1 degrees of freedom
CHISQ(n-1) = Chi-squared distribution with n-1 degrees of freedom
n = number of blood lead values in the data set

The results are shown in Figure 1. As seen, there has been a clear time-trend toward decreasing P10 values, and in recent years (2000 to present), the calculated P10 value is very low and the uncertainty bounds are quite narrow and do not overlap the health based goal (P10 $\leq$ 5%). This result indicates that the number of children participating in the blood lead program is sufficient to evaluate compliance with heath-based objectives with acceptable confidence.

In considering these results, it is important to recognize that statistical uncertainty in a statistic is a function of the absolute size of the sample (n), and not the fraction of the population. For example, in surveys of the U.S. population such as NHANES III (DHHS 2005), the number of children age 0-5 years for whom blood lead values are obtained is sufficiently high (about 700 to 900) that statistical confidence in blood lead statistics is high, even though the fraction of the total population of all children age 0-5 years contained in the sample is very small (about 0.005%).

Representativeness

If a study of a population is based on a sample that includes some but not all of the members of the population, it is important to ensure that the sample that is evaluated is representative of the entire population. If this is not true, conclusions based on the sample may not apply to the population, leading to potentially misleading decisions.

The list of variables that must be considered when assessing the representativeness of a sample depends on what is being evaluated. In the case of blood lead values, the factors to consider include all of the variables that are known or suspected to influence blood lead values in children, including:

- Lead levels in soil
- Lead levels in other sources (paint, diet, water, other indoor sources)
- Behaviors that cause exposures (e.g., mouthing frequency)
- Socioeconomic status
- Nutritional status

The East Helena Lead Education and Abatement Program does not routinely collect data on these variables as part of the blood lead survey, but does collect qualitative data on some of these variables during their in-home environmental assessments. Hence, a detailed statistical

evaluation of representativeness based on the parameters is not possible. However, data are available to support two important evaluations of representativeness, as follows.

Spatial Representativeness

Many of the key variables that tend to influence blood lead values (e.g., lead levels in soil and other sources, socioeconomic status, nutritional status, behaviors) are likely to differ from neighborhood to neighborhood. Indeed, if a factor does not differ between locations, then it is not an important determinant of representativeness. Thus, an assessment of the spatial representativeness of blood lead values that have been collected is a good way for ensuring that a number of potentially important demographic variables are properly represented in the blood lead data set.

Figure 2 is a map showing the location of properties from which one or more blood lead samples has been collected by the County. As seen, there are numerous samples from each neighborhood, supporting the conclusion that the data set is spatially representative. This is supported by the results presented above which indicate that the participation rate in most neighborhoods is about 25-50%.

Representativeness Based on Soil Lead Values

One important variable to consider in this project is the representativeness of soil lead levels at the homes where participants in the blood lead study reside. For example, if 10% of the children in the community live at properties where current soil lead values are higher than 1000 ppm, but only 5% of the children in the blood lead survey came from homes with soil above 1000 ppm, this could lead to an underestimate of the number of children with elevated blood lead values. The following table provides the data needed to make this assessment:

Year	% of all properties with PbS > 500 ppm	% of all PbB participants who came from properties with PbS > 500 ppm
1991-92	63%	60%
1993-94	50%	50%
1995-96	34%	22%
1997-98	26%	14%
1999-00	24%	8%
2001-02	22%	21%
2003-04	21%	7%
2005-06	19%	11%

As seen, in the early years of the program (1991-1994), the fraction of children in the blood lead program who resided at properties with soil lead levels > 500 ppm was similar to the overall fraction of soils > 500 ppm in the community. Starting around the mid 1990's, the fraction of

participating children from yards with soil lead > 500 began to decrease in comparison to the fraction of yards with soil > 500 ppm. However, this is probably not a valid indication that the population of children who participate in the blood lead program is biased toward children from low soil lead yards. Rather, this low rate is more likely a direct consequence of the active efforts EPA has made to clean up lead in yards where children are residing. Recall that the trigger for a yard cleanup is any quadrant of a yard where the 95% upper confidence limit (UCL) on the measured concentration UCL exceeds 1000 ppm. Of all properties where the yard wide average is 500-1000 ppm, nearly 70% exceed this trigger. This highlights that the effective action level for lead in East Helena soil in closer to 500 ppm than 1000 ppm (based on yard wide averages), and explains why continued operation of the cleanup program is expected to have been selectively eliminating properties where children are present and the soil level is > 500 ppm. This preferential remediation strategy likely accounts for the low number of children tested in recent years from such properties.

Contribution of Soil Lead to Blood Lead Values

These same data on soil lead and blood lead may also be used to evaluate the importance of soil lead as a contributor to blood lead. Figure 3 shows a plot of blood lead *vs* soil lead for each of several years. Summary statistics are presented below the figure. As seen, there is no clear tendency for blood lead to increase as soil lead increases, and the average slope (ug/dL in blood per 1000 ppm of soil lead) across six years of observation is not different from zero. These findings support the conclusion that, at least below 1,000 ppm, lead in soil is a minor source of blood lead in this community. This may be contrasted with the predictions of the IEUBK model, which indicate an increase of 7.9 ug/dL in blood lead per 1000 ppm of soil lead.

This finding is also supported by a comparison of the distribution of blood lead values in children stratified by soil lead level, as shown in Figure 4. As seen, there is no apparent difference between children who live at properties that have been remediated with clean fill, and at properties where remediation has not occurred and soil lead levels are either < 500 ppm or are between 500 and 1000 ppm. As above, this indicates that, at this site, the contribution of soil lead < 1000 ppm to blood lead is sufficiently small that the effect can not be detected.

These findings based on current data are also consistent with the results that were obtained at this site in the past (Hydrometrics 1993). In this analysis (shown in Figure 5), multivariate regression of the relationship between blood lead, soil lead and lead in air indicated that lead in soil does not begin to contribute substantially until the soil lead level exceeds 3000 ppm, and that in the past, the chief contributor to elevated blood lead values was the airborne dust pathway, which would have been associated with continuous, day-to-day deposition of fine particulates with elevated lead content onto streets and other surfaces, which ultimately found its way into homes.

<u>Summary of Response to Question 5</u>

The East Helena Lead Education and Abatement Program, administered by the City-County Health Department, has been performing a blood lead survey in East Helena for a number of years. The data from this survey show that blood lead values have decreased substantially over time, and that the incidence of PbB above 10 ug/dL is now very close to zero. These data support the conclusion that cleanup activities at the site, coupled with the effects of national programs to reduce lead in the environment, have been successful in reducing lead exposures from all sources in East Helena to acceptable levels. However, in order for this conclusion to be valid, it is important to examine the quality of the blood lead data set. Based on a consideration of participation rate, statistical uncertainty, spatial representativeness, and soil lead representativeness, it is concluded that the blood lead data generated by the County program are reliable and are appropriate for use by risk managers and other health professionals in assessing site conditions.

References

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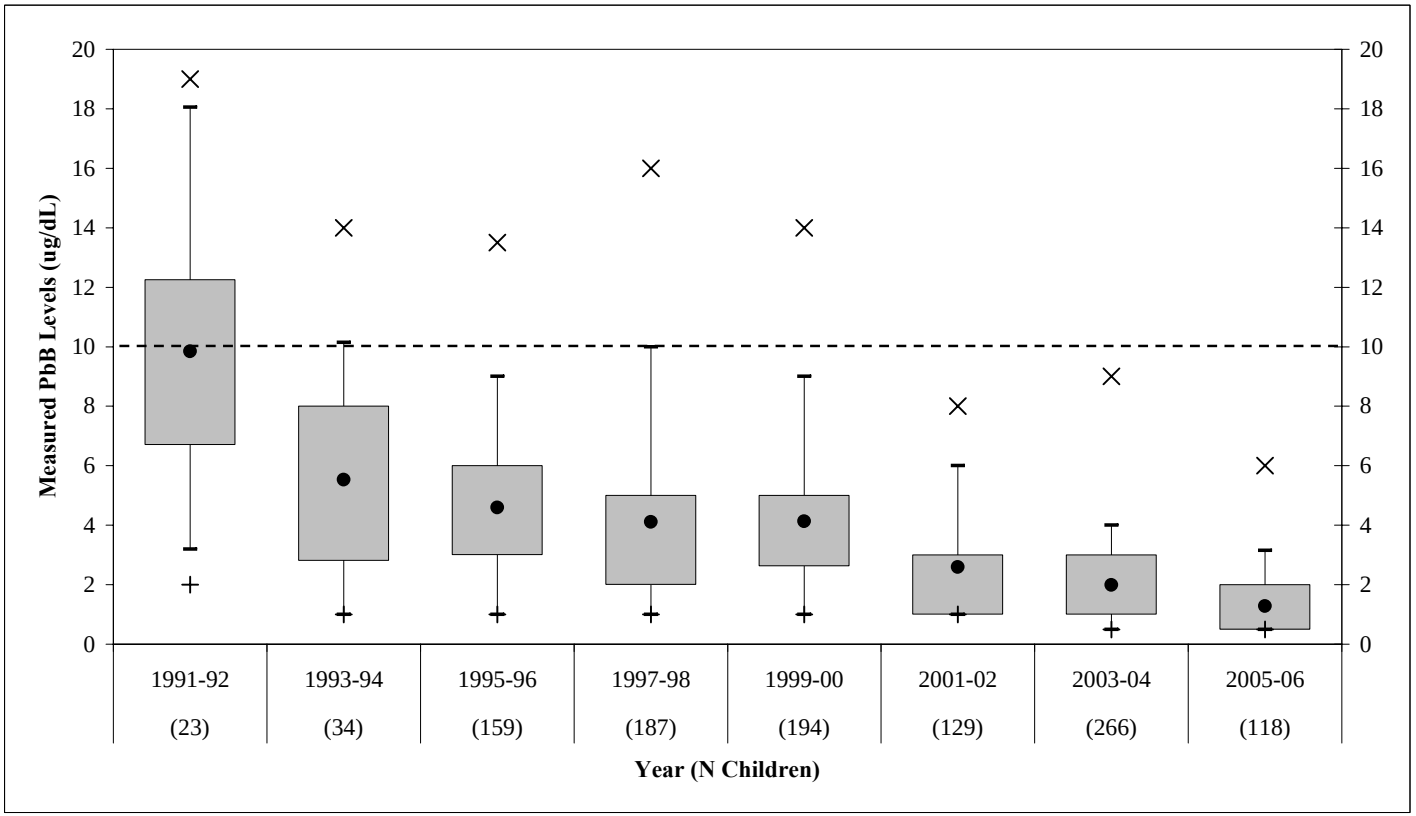
Gilbert RO. 1987. Statistical methods for Environmental Pollution Monitoring. Van Nostrand Reinhold, New York, pp. 181-182.

Crow EL, and Shimizu K. 1988. Lognormal Distributions: Theory and Applications Marcel Dekker, Inc., New York.

DHHS. 2005. Third National Report on Human Exposure to Environmental Chemicals. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Environmental Health. NCEH Pub. No. 05-0570. July, 2005.

BLOOD LEAD VALUES FOR CHILDREN (0 to ≤ 84 mos) IN EAST HELENA FROM 1991 TO 2006



Restricted to children in East Helena aged 0-84 months (at the time of PbB collection).
PbB values reported as <1 ug/dL evaluated at 0.5 ug/dL.
If multiple PbB samples are available for a child within a year, the mean PbB value across samples was used.

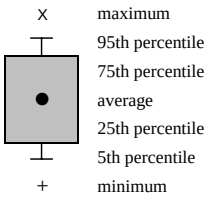


FIGURE 1

UNCERTAINTY IN P10 VALUES FOR CHILDREN (AGE 0 to ≤ 84 mos) IN EAST HELENA

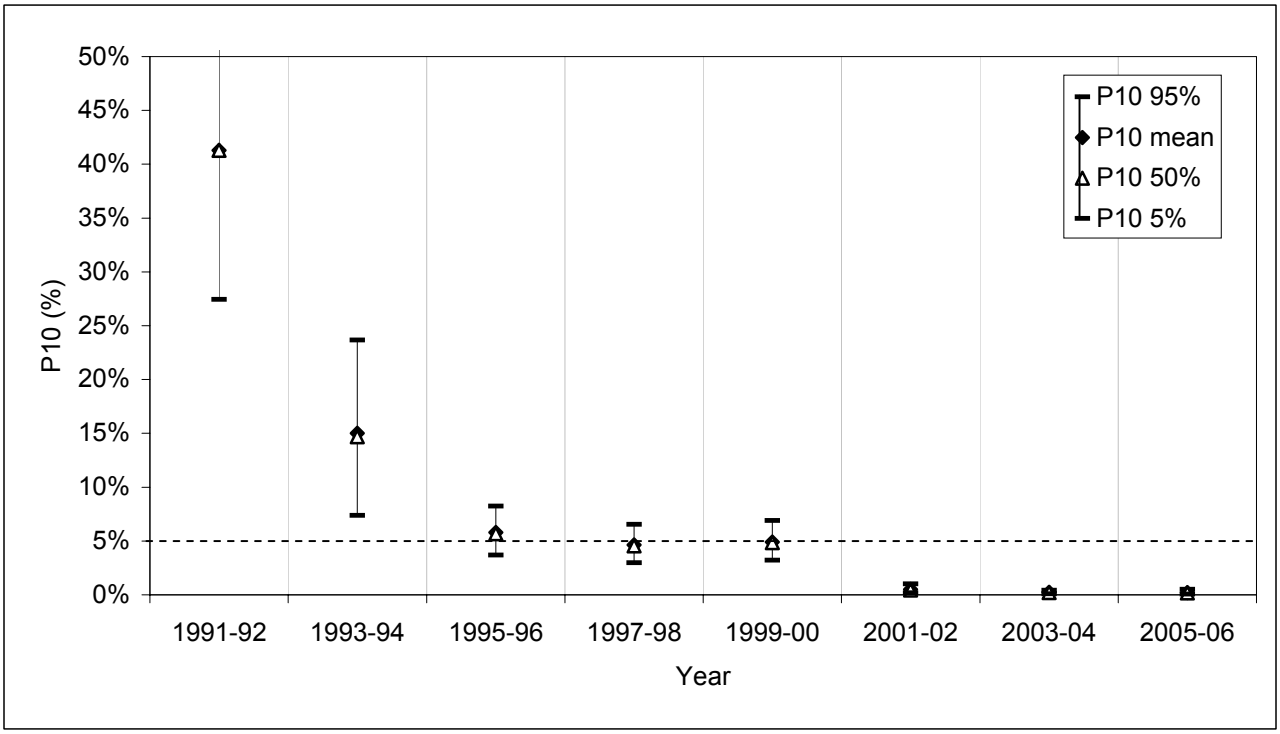
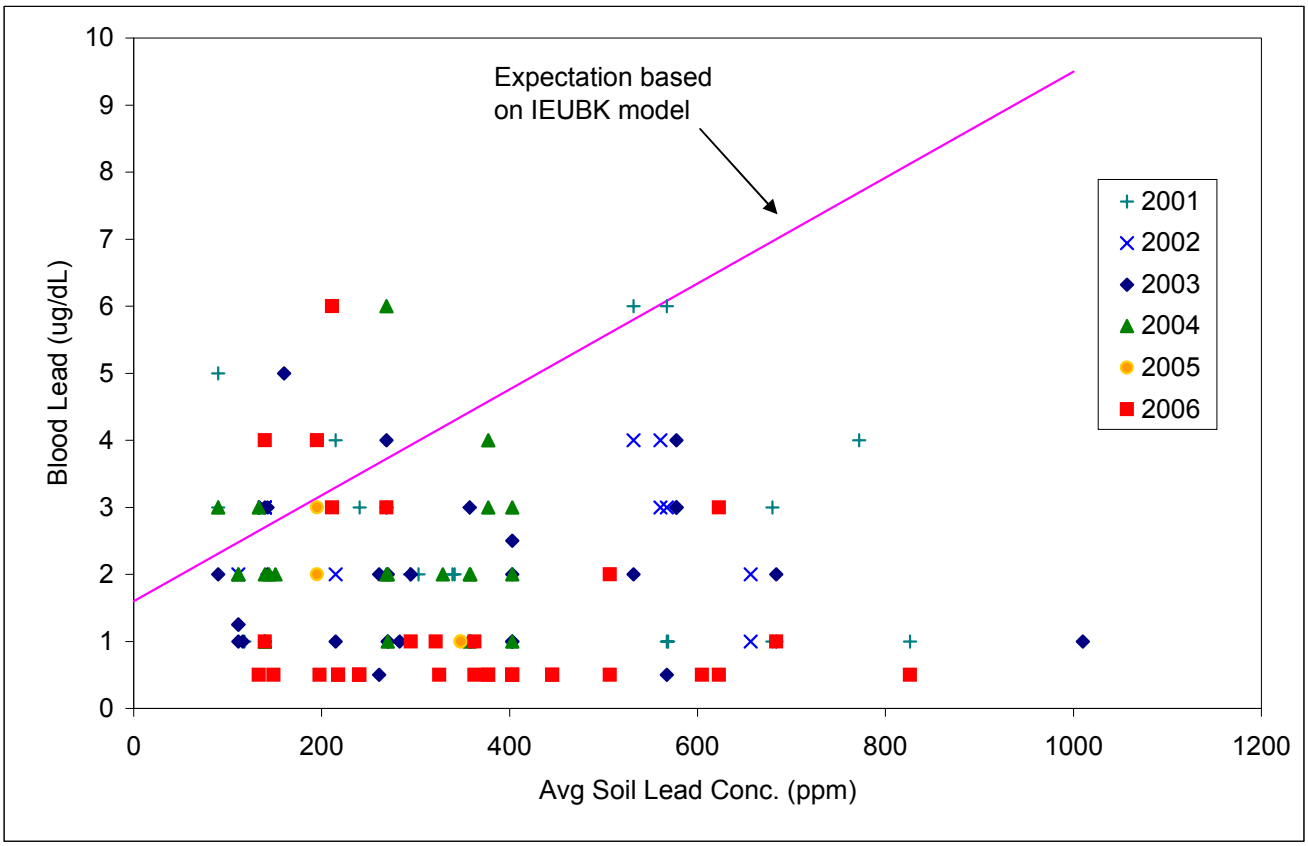


FIGURE 2
LOCATION OF BLOOD LEAD MEASUREMENTS
NEAR THE EAST HELENA SMELTER (1995-2006)

Image based on map provided by Lewis & Clark County GIS

FIGURE 3
RELATION BETWEEN SOIL LEAD AND BLOOD LEAD VALUES
FOR CHILDREN (0 to ≤ 84 mos) AT UNREMEDIATED PROPERTIES
IN EAST HELENA 2001 - 2006



Year	N	Slope
2001	18	-0.70
2002	10	0.08
2003	37	0.01
2004	22	0.90
2005	4	-9.82
2006	33	-1.80

Mean (obs)	-0.0019	-1.89
Expected (IEUBK)	0.0079	7.90

FIGURE 4

BLOOD LEAD VALUES FOR CHILDREN (0 to ≤ 84 mos)
IN EAST HELENA FROM 2001 - 2006 IN RELATION TO
REMEDIATION STATUS AND SOIL LEAD CONCENTRATIONS

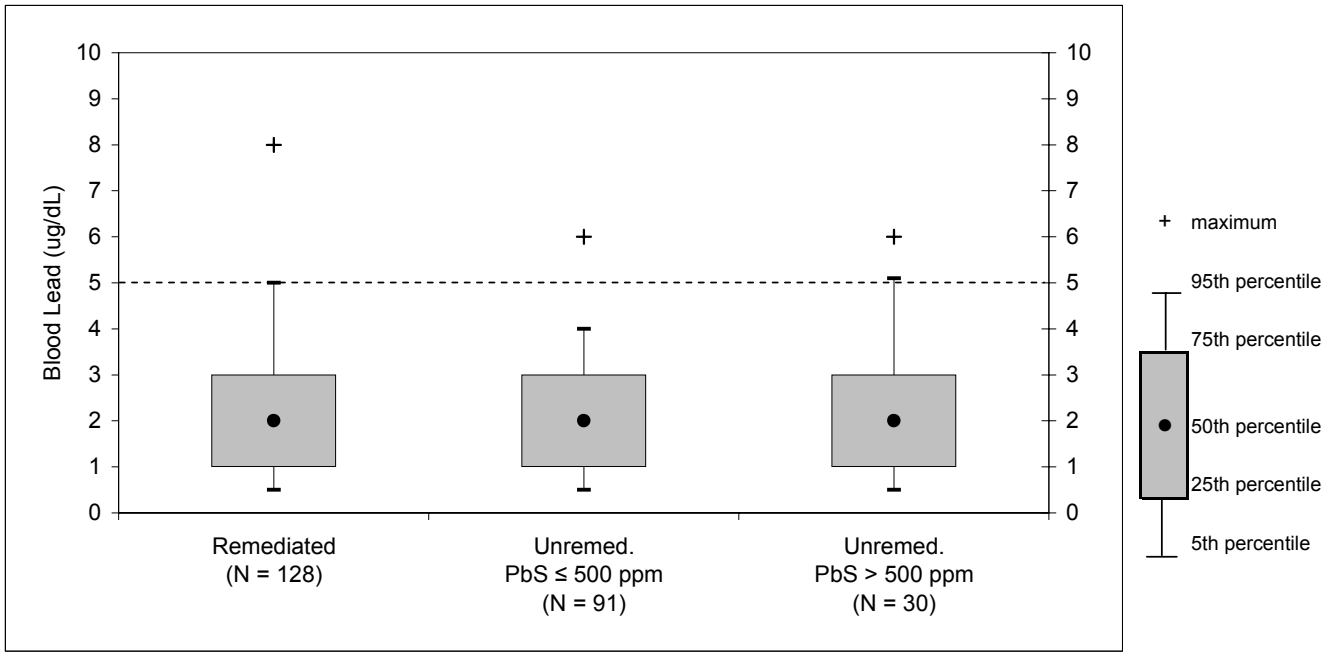
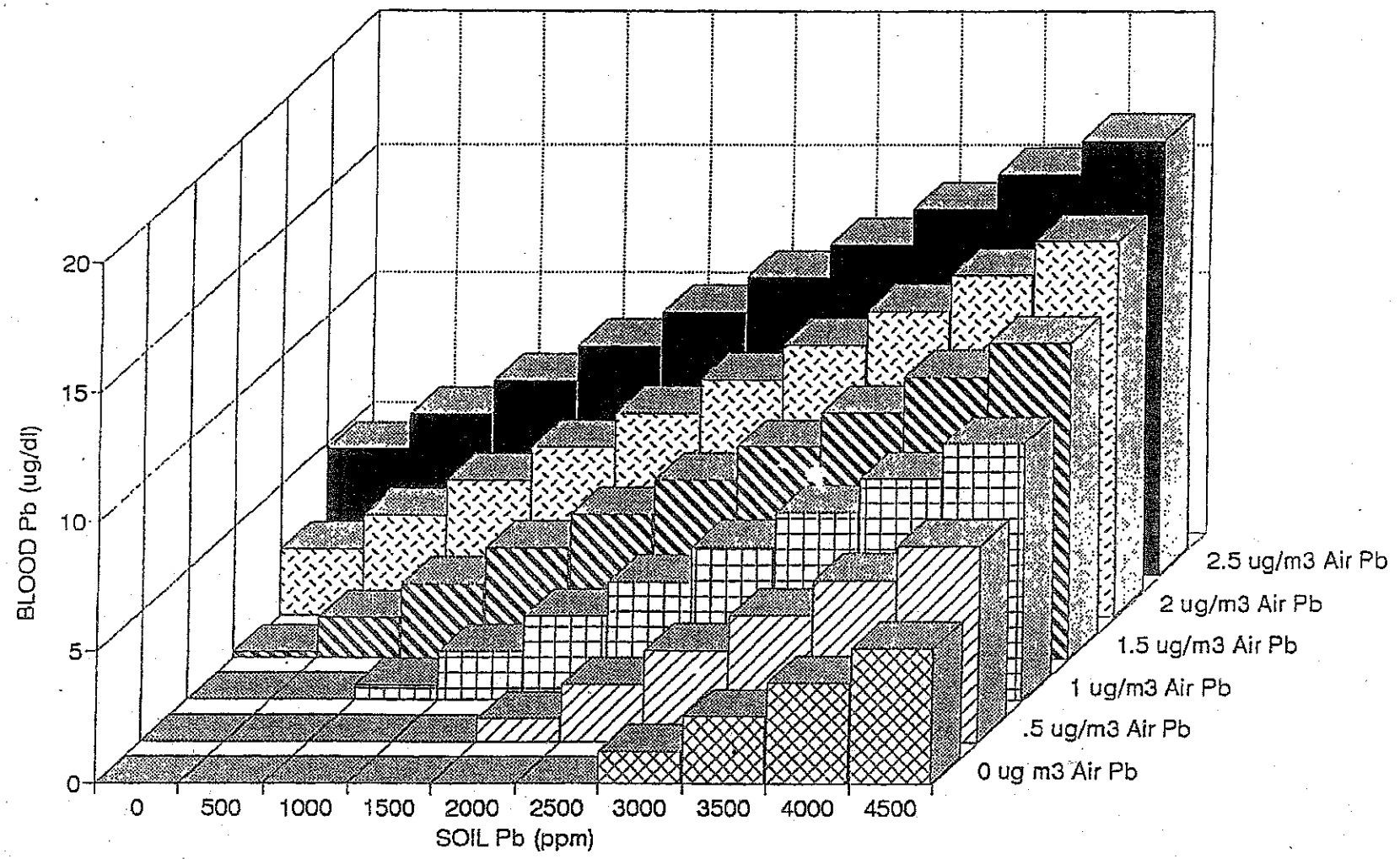


FIGURE 5

EAST HELENA LEAD EVALUATION
Soil/Air/Blood



(Source: East Helena, Montana, Soil, Blood and Air Lead Data Evaluation, Hydrometric, Inc, 1993)

EPA RESPONSES TO QUESTIONS FROM
LEWIS AND CLARK COUNTY HEALTH BOARD
Based on meeting held December 17, 2007

1. **Discuss the rationale for EPA's decision (on a national level) against lowering the "level of concern" for lead in children's blood (now 10 ug/dL) and discuss implications of a site-specific lowering of the "level of concern" to 5 ug/dl or 2 ug/dl.**

The rationale for EPA and CDC not lowering the blood lead level of concern below 10 ug/dL is addressed by the Centers for Disease Control and Prevention in their 2005 document entitled *Preventing Lead Poisoning in Young Children.* It reads as follows:

"In 1991 the CDC recommended lowering the level for individual intervention to 15 ug/dL and implementing community-wide primary lead poisoning prevention activities in areas where many children have blood lead level greater than 10 ug/dL. Some activities, such as taking an environmental history, educating parents about lead, and conducting follow-up blood lead monitoring were suggested for children with blood lead levels greater than 10 ug/dL. However, this level, which was originally intended to trigger communitywide prevention activities, has been misinterpreted frequently as a definitive toxicologic threshold. Evidence exists of adverse health effects in children at blood lead levels less than 10 ug/dL. The available data are based on a sample of fewer than 200 children whose blood lead levels were never above 10 ug/dL and questions remain about the size of the effect. At this time there are valid reasons not to lower the level of concern established in 1991 including the following:

- No effective clinical or public health interventions have been identified that reliably and consistently lower blood lead levels that already are less than 10 ug/dL.
- No one threshold for adverse effects has been demonstrated. Thus the process for establishing a lower level of concern would be arbitrary and no particular blood lead level cutoff can be defended on the basis of the existing data. In addition, establishing a lower level of concern may provide a false sense of safety about the well being of children whose blood lead levels are below the threshold.
- The adverse health effects associated with elevated blood lead levels are subtle. Individual variation in response to exposure and other influences on developmental status, make isolating the effect of lead or predicting the overall magnitude of potential adverse health effects exceedingly difficult.
- Efforts to identify and provide services to children with blood lead levels less than 10 ug/dL may deflect needed resources from children with higher blood lead levels who are likely to benefit most from individualized interventions."

At the East Helena site, the Lead Education and Advisory Committee, consisting of the EPA, MDEQ, Lewis and Clark County Health Department, City of East Helena, and Asarco have established a Remedial Action Objective that there should be no more than a 5% probability a

child will have a blood lead value greater than 4 ug/dL. This is a goal more stringent than the national goal (no more than a 5% chance of exceeding 10 ug/dL), and this goal has been achieved in East Helena in every year from 2002 to the present.

2. Discuss in greater detail the extent to which education and outreach are thought to affect children's blood lead levels in East Helena.

EPA believes that it is unlikely that the extremely low blood lead levels observed in East Helena are due to public education and awareness. While EPA agrees that the current program of lead education is valuable in providing citizens with knowledge they may utilize to reduce risk from lead exposure, EPA does not believe that this program could be responsible for generating a bias in the data set that could account for the current observations. From 1989 – 1991, EPA conducted the Urban Soil Lead Abatement Demonstration Project in Baltimore, Boston, and Cincinnati (USEPA, 1996). The study examined the effectiveness of soil, interior dust and lead abatement in reducing children's blood lead levels. In the control groups which received no abatement, but were aware of the study and the hazards associated with lead, the investigators found significant decreases in children's blood lead levels in the first 6 months. These blood lead levels rebounded to pre-study levels by the 2nd year of the study. This study suggests that awareness of lead hazards may result in temporary changes in behavior which reduce exposure to lead hazards, but the changes are not long term. The blood lead studies in East Helena have been conducted for more than 15 years. The results are consistently low, and the trend is downwards. It is unlikely that they are influenced to any large extent by public awareness. Moreover, the blood lead data for East Helena children indicate that current exposure levels are sufficiently far from a level of concern that even if there were some small bias in the data (this is not thought to be true), the judgment that the blood lead data indicate the current soil cleanup program is effective remains valid.

<u>Reference</u>

US Environmental Protection Agency (1996). Urban Soil Lead Abatement Demonstration Project Volume I: EPA Integrated Report. National Center for Environmental Assessment, Research Triangle Park, NC. EPA/600/P-93/001aF.

3. Can the need for institutional controls be reduced (minimized) by adopting a more stringent soil cleanup action level? Provide an in-depth discussion and breakdown of each component of institutional controls, including estimated short- and long-term costs per component. For clarification, Kathy Moore added: The Board seeks assurances that funding will be adequate, and that EPA and MDEQ will "be there" to provide assistance, advice and coordination.

EPA has demonstrated that, irrespective of the soil cleanup action level, the need for both short-term and long-term institutional controls remains unchanged because residual levels of lead will

remain in place. Institutional controls are best defined as remedy protection measures, and EPA has described in the Proposed Plan, Decision Summary and Responsiveness Summary that ICs are an essential part of the remedy.

As for the second part of the question, EPA has provided a "breakdown" of ICs by their components in the Decision Summary and Responsiveness Summary. However, cost estimates cannot be prepared by EPA alone. The annual cost for maintaining the Lead Education and Abatement Program is approximately $140,000. The extent to which ICs administration will be carried out by the lead abatement program, or perhaps another county program, is unknown. Also unknown is whether or not the county will seek fees to carry out ICs that are routinely conducted by the county already (e.g., subdivision planning and reviews, best management practices and weed control on undeveloped lands, maintaining a GIS database to keep track of sampling results, etc.). These are but two examples of cost estimates that EPA cannot provide without the county's input.

EPA is prepared to continue work with the county, as before, once the Record of Decision is issued and throughout the remedial design and remedial action construction phases of remedy implementation. With input from the county, and exchange of information, the ICs components may be refined and costs estimated. EPA anticipates that the Board of Health will resume deliberations regarding its vital role in administering ICs. The Board may adopt regulations and develop policies regarding ICs.

It would be both presumptuous and very likely unsuccessful for EPA to "specify" or "prescribe" ICs beyond the extent to which ICs have to date been identified. Thus, development, funding and administration of ICs must be a cooperative effort. EPA has numerous times demonstrated its commitment to supporting the county, and EPA will continue to work with and support the county for as long as is necessary.

4. Some East Helena children have been tested multiple times. How were multiple tests treated in the representations of data to date? Plot on an aerial photo data that represent children who were tested multiple times. Scott Brown and Kathy Moore discussed this request with Jan Williams and Debb Tillo and the following conclusions were made: EPA's contractor has access to the county-managed data base. EPA can plot these data on an aerial photo (in a manner similar for all children tested between 1995 and 2006, irrespective of how many times each child had been tested). However, EPA's contractor will need assistance from Jan and Debb, as before, and from the County's GIS unit, also as before. The new plots should be considered in combination with existing plots.

When an individual child was tested more than one time, all values from the same child within the same calendar year were averaged. If a child was tested in more than one year, these values were kept separate when calculating yearly summary statistics and evaluating time trends.

Sheet 3 in the Record of Decision, prepared by the County, shows the locations of homes where one or more children had more than one blood lead value collected. As seen, the locations of homes where children have been evaluated more than one time are distributed across the city's many neighborhoods and outlying subdivisions in a manner that demonstrates a high degree of spatial representativeness.

In interpreting this information, it is useful to contemplate reasons why a child would have more than one blood lead result. EPA believes the most likely reason is that the first blood lead result would have been higher than what the parents felt was appropriate, and that follow-on tests were performed to determine if the first value was correct or to see if values decreased over time. However, a complicating factor in this analysis is the incentive program offered by the County, which may have encouraged some parents to have multiple tests of their children's blood lead, even when initial blood lead values were low.

Table 1 shows summary statistics that test this hypothesis. As seen, the data indicate children with high initial blood lead values tended to have more follow-up blood lead measurements (an average of 1.7 follow-ups per child) than children with lower initial blood lead values (about 0.3 follow-up visits per child). Note that this pattern may tend to bias the blood lead data set in an upwards (overestimation) direction, since children with elevated values contribute data more frequently than children with lower values.

TABLE 1.
RELATION BETWEEN INITIAL BLOOD LEAD RESULT
AND NUMBER OF REPEAT MEASUREMENTS

Initial PbB Result (ug/dL)	N Children	N Follow-up PbB Measurements							Avg. Follow-up Visits
		0	1	2	3	4	5	6	
0-3	550	436	79	24	6	3	2		0.30
3-6	206	154	45	4	1	1		1	0.32
6-10	84	47	20	14	2	1			0.69
>10	24	7	8	2	4		2	1	1.67

5. Reexamine the apparent "upward trend" of higher blood lead values for East Helena children observed in 2006, as compared to previous years. Kathy Moore's follow-up memo (attached) clarifies this point:

> ***I wrote, "there are more children over 4 (ug/dl) than there were 6 years ago." This may be what Vic was talking about. I also wrote that there is, "a 30% increase in kids over 4, the trend is increasing." I believe this addresses your question about the statistical bump in 2005.***

Table 2 shows the number and fraction of children with blood lead values above 4 ug/dl as a function of year. As seen, the percentage of children above 4 ug/dl trended downward through the 1990s. This initial downward trend, EPA believes, is explained primarily by reductions of fine particulates being emitted from plant operations. By 1998-2000, Asarco began meeting the federal and state standards for lead in air. Then, as seen in Table 2, the percentage of children above 4 ug/dl decreased substantially more in 2001 and has since remained low. This decrease corresponds to the time frame in which the smelter ceased operations and all emissions from the smelter to the surrounding community were eliminated.

EPA does not interpret the data as being an "upward trend" in either 2005 or 2006. And, the fraction of children above 4 ug/dl in 2006-2007 is not higher than the fraction of children above 4 ug/dl in 2000-2001. In 2004, the fraction was slightly higher (7%) than in the two preceding years (0-3%), but that did not continue into 2005, 2006, or 2007. It is important to recognize that yearly statistics of this type are inherently variable, and it would not be appropriate to make judgments about trends based on one or two years of data. Rather, in order to determine the presence of time trends, the data must be considered in their entirety.

TABLE 2
FRACTION OF CHILDREN ABOVE 4 UG/DL AS A FUNCTION OF YEAR

Year	Number of Children	PbB > 4 ug/dL
1991	71	51%
1992	15	87%
1993	10	80%
1994	24	46%
1995	75	51%
1996	84	33%
1997	71	37%
1998	116	25%
1999	51	65%
2000	143	27%
2001	93	14%
2002	36	0%
2003	159	3%
2004	107	7%
2005	9	0%
2006	109	2%
2007	7	0%
2008	184	4%

6. Update the multiple regression analysis graph (1993 report, using Lewis and Clark County's 1991 blood lead data) to include all of the more recent matched pairs of soil-lead

and blood-lead data and more recent air pathway inputs after 1993. Recalculate the estimated contribution arising from exposure to soils (i.e., the contribution to actual, observed blood lead levels) based on the more recent data set.

Multi-variate regression to quantify the relationship between blood lead and the concentration of lead in soil and air is confounded if blood lead values are changing because of factors other than changes in soil or air. In particular, it is well established that there has been an on-going downward trend in blood lead levels at the national level due the success of several national programs that have reduced lead exposures from food, water, automobile exhaust, and consumer products.

As a starting point, EPA recognized that one potential limitation to the previous multiple regression analysis is that it assumes that 100% of the decrease in blood lead between 1983 and 1991 is due to the change in air concentration in East Helena. However, as mentioned, there has been an on-going downward trend in blood lead levels at the national level. Therefore, EPA reevaluated the 1983 and 1991 data set to account for the success of national programs in reducing lead exposures.

Figure 1 plots the prediction of this reevaluation.

FIGURE 1.
REVISED ANALYSIS

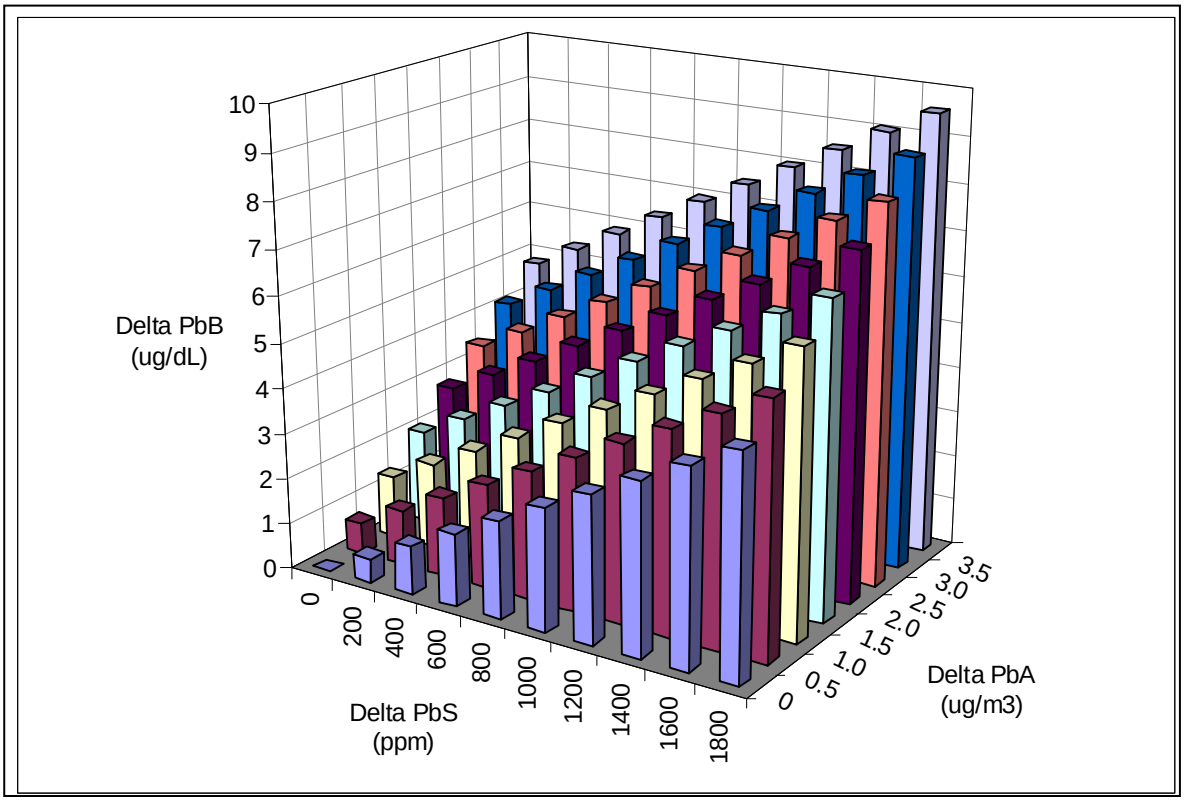


TABLE 3
RELATIVE INCREMENT DUE TO AIR COMPARED TO SOIL

Year	ΔPbA ug/m3	ΔPbS ppm	PbB Increase Over Baseline (ug/dL)		
			From Soil	From Air	% From Air
1983	2.61	250	0.66	3.60	84%
		500	1.33	3.60	73%
		750	1.99	3.60	64%
		1000	2.66	3.60	58%
		1500	3.98	3.60	47%
1991	1.83	250	0.66	2.52	79%
		500	1.33	2.52	66%
		750	1.99	2.52	56%
		1000	2.66	2.52	49%
		1500	3.98	2.52	39%

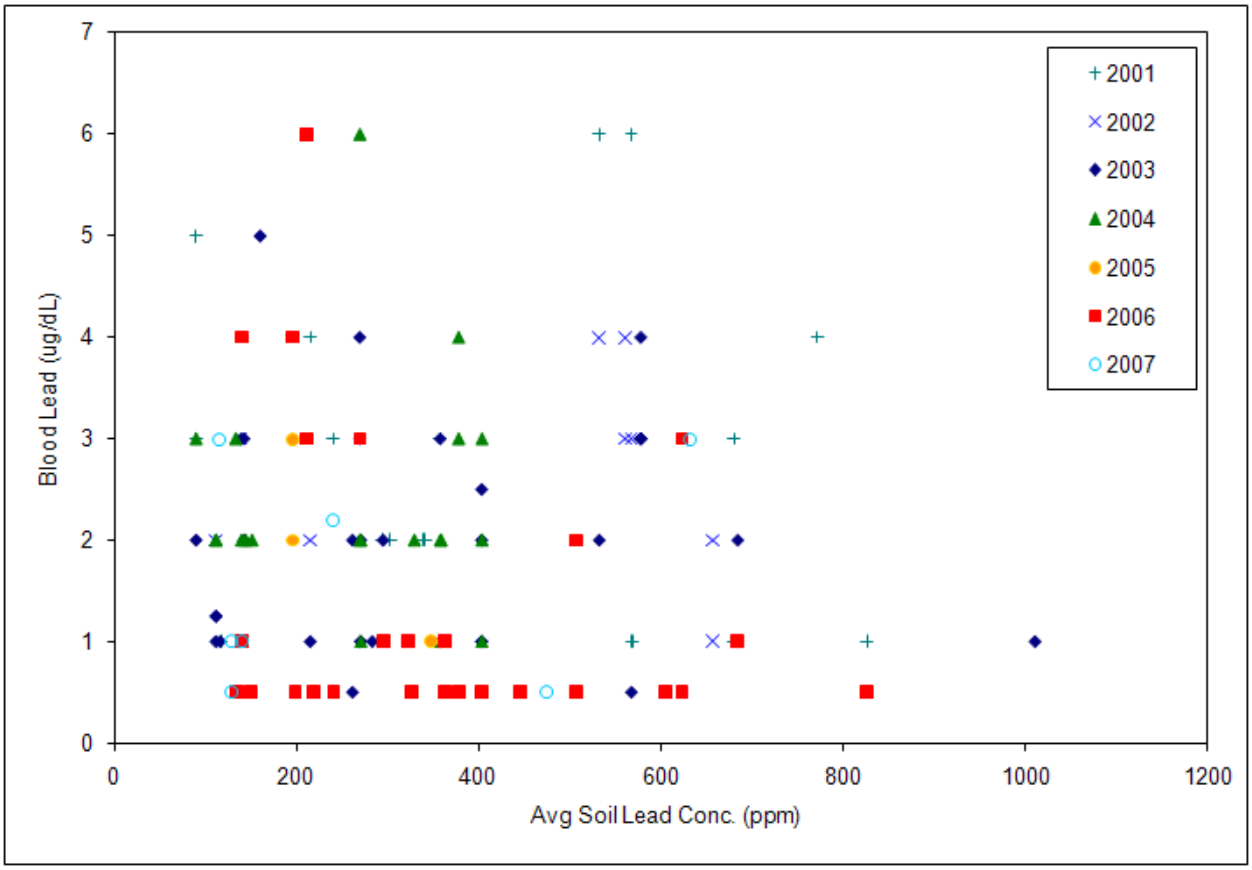
As seen, the revised analysis supports the conclusion that lead in air is likely to have been the predominant contributor to blood lead levels in both 1983 and 1991, at least for locations where soil lead concentrations did not exceed the national average by more than about 1000-1500 ppm.

For more recent data, it is appropriate to analyze the data in a series of time strata because multi-variate regression to quantify the relationship between blood lead and the concentration of lead in soil and air is confounded if blood lead values are changing because of factors (national trends) other than changes in soil or air. An approach using data for individual years helps minimize the confounding caused by the decreasing trends in national blood lead levels. Results of an analysis of this type are shown in Figure 2. In this graph, blood lead values, stratified by calendar period, are plotted as a function of soil lead. Stratification based on air lead is not included because air levels are now quite low and are unlikely to be a significant contributing source of elevated blood leads. Based on data from four air monitoring stations in East Helena in 2000 and 2001, the average concentration of lead in air was about 0.5 ug/m^3, and decreased to near zero background concentrations after 2001.

If soil lead is a major source of blood lead, it is expected the data will tend to display an upward trend. However, as shown in the figure and table below (Figure 2), the slopes of the lines in all years are quite shallow. Based on all of the data, the average slope is close to zero, even with excluding the high negative slope observed in 2005, which is based on only 4 values[1]. These data indicate that, under recent site conditions, lead in soil is only one of many sources of blood lead, and that its contribution to blood lead in children is small compared to other sources.

[1] Note that it is not possible to plot a line that displays the average slope on the graph because the intercept term is time-dependent.

FIGURE 2
RELATION BETWEEN AVERAGE SOIL LEAD AND BLOOD LEAD VALUES
FOR CHILDREN (0 TO 84 MONTHS) AT UNREMEDIATED PROPERTIES
IN EAST HELENA 2001 - 2007



Year	N	Intercept ug/dL	Slope ug/dL per 1000 ppm	P value
2001	18	3.1	-0.70	0.699
2002	10	2.7	0.08	0.985
2003	37	1.9	0.01	0.989
2004	22	2.0	0.90	0.691
2005	4	4.4	-9.82	0.095
2006	33	1.9	-1.80	0.197
2007	7	1.2	1.44	0.565

7. Reexamine all other relevant data pertaining to sources and pathways of lead exposure, particularly results of numerous in-home environmental assessments conducted by health professionals. Does the weight of evidence suggest that attic dust, heating system dust, unfinished basements, carpets or furniture, wall insulation, hobbies, garden vegetables,

pets, parents' workplace, interior or exterior paint, or any other possible sources or pathways do contribute or do not contribute to children's blood lead levels?

A data table was provided to EPA by the County that summarized the results of 111 Exposure Assessment (EA) visits. Of these 111 EAs, 25 occurred at locations where no data were available on the level of lead in the soil. Of the 86 properties for which yard lead levels are known, about 2/3 had soil that exceeded EPA's cleanup triggers for lead, and where the soil had either been cleaned up at the time of the visit or were scheduled for cleanup.

For each EA, information was provided regarding the occurrence of non-soil sources of lead exposure such as leaded paint, elevated lead in indoor dust, lead in drinking water, a parent who worked at the smelter, etc. Of these EAs, a blood lead value (the highest observed at the property) was reported for 63 visits. Table 4 summarizes data on the frequency that non-soil sources were identified, stratified as a function of maximum blood lead for these 63 EAs. As seen, the average number of alternative sources tends to increase as the maximum observed blood lead increases. For the highest category (maximum blood lead > 10 ug/dL), alternative sources of lead exposure were identified in 90% of the visits, with an average of 1.6 alternative sources per location. These results support the conclusion that there are multiple sources of lead exposure in the community, and that there is an association between alternative sources (i.e., sources other than yard lead) and the occurrence of elevated blood lead values.

TABLE 4
SUMMARY OF ENVIRONMENTAL ASSESSMENTS FOR
ALTERNATIVE SOURCES OF LEAD EXPOSURE

PbB (ug/dL)	N	Number of Alternate Sources								
		0		1		2		3		Count weighted average
0 - 6	35	19	54%	13	37%	3	9%	0	0%	0.54
>6 - 10	18	8	44%	5	28%	2	11%	3	17%	1.00
>10	10	1	10%	3	30%	5	50%	1	10%	1.60
Total	63	28	44%	21	33%	10	16%	4	6%	0.84

8. Reexamine soil arsenic data. Provide all pre-sample results for arsenic and show distribution contours for soil arsenic, at varying concentrations, in the same manner as

distribution contours are provided for lead at varying concentrations. Kathy Moore's follow-up memo clarifies this point.

> ***Also, the questions about how the arsenic level was chosen and is it a scientifically supported cleanup level or a cleanup level that is coincidental to lead levels is still a big question.***

The method used to compute the risk-based concentration (RBC) for arsenic is based on standard EPA methods. The equation is:

$$RBC = \text{target risk} / (HIF \cdot RBA \cdot oSF)$$

where:

HIF	=	Human Intake Factor. This describes the average amount of soil ingested per day (kg/kg-day).
RBA	=	Relative bioavailability of arsenic in soil compared to water
oSF	=	Oral slope factor for arsenic $(mg/kg\text{-}day)^{-1}$

The target risk chosen was 1.499E-04, since this will yield the concentration value where risk change from 1E-04 (acceptable) to 2E-04 (unacceptable). The HIF is based on standard USEPA assumptions about residential exposure to soil (350 days year for 30 years, with intake rates of 200 mg/day as a child (age 0-6) and 100 mg/day as an adult (age 7-30)). Based on measurements of arsenic RBA at many mining sites, a value of 50% was used. This is considered to be conservative, since nearly all measured values are lower than this. Likewise, based on data from numerous other mining and smelting sites, the concentration of arsenic in indoor dust was assumed to be 50% of that in outdoor soil. This too is considered to be conservative, since the observed ratios are nearly always lower than this. Based on these inputs, the RBC for arsenic in residential soil is 176 ppm.

Figure 3 shows the relationship between arsenic and lead in soil samples from the site. As seen, although there is variability, there is a clear relation between the two. This implies that, on average, elevated levels of arsenic will be associated with elevated levels of lead. At a RBC of 176 ppm, all properties (6) with arsenic concentrations greater than 176 ppm would have been cleaned up as part of the cleanup for lead. However, EPA has selected in this ROD a lower cleanup action level for arsenic in residential soil (100 ppm), which is the concentration of arsenic that is readily and cost-effectively attained in combination with the selected cleanup action level for lead in residential soil (1,000/500 ppm).

Sampling to date has shown that only approximately five properties have yard-wide average arsenic concentrations greater than 100 ppm arsenic in association with lead concentrations less than 1,000 ppm. These properties are located north of East Helena's city limits where historical ditches and channels are present. Historical runoff from the smelter property that flowed through these channels and ditches contributed to the arsenic contamination on these properties. Results

from sampling of these ditches as part of the residential sampling likely caused the property to exceed a concentration of 100 ppm. It is also noted that these five properties have average lead concentrations less than 700 ppm, and most have lead concentrations less than 500 ppm. These properties are scheduled for cleanup in 2009 under the on-going removal action.

EPA Region 8 typically assumes a residential exposure unit for arsenic based on a neighborhood scale. However, in the case of East Helena, risk assessment managers chose to apply the adjusted action level to each residential yard. The adjusted soil arsenic cleanup action level (100 ppm), once implemented, will ensure that residual risks fall within EPA's risk range of 10^{-4} to 10^{-6} (risk of one excess cancer for every 10,000 to 1,000,000 people) and within the range of residential cleanup levels for arsenic in soil in Region 8 (70 – 250 ppm).

LEWIS & CLARK CITY-COUNTY
Health Department

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September 16, 2009

To: Richard Opper, Director, Montana Department of Environmental Quality

From: Melanie Reynolds, Health Officer, Lewis and Clark County

Re: Comments on Draft Record of Decision for the East Helena Superfund Site

Thank you for the opportunity to provide you with our comments on the East Helena Superfund Site, Operable Unit No. 2, Residential Soils and Undeveloped Lands Draft Final Record of Decision (ROD).

Inaccurate Statements

Of first importance, the ROD states that *'the LCC concurred on the cleanup level of 1000/500 ppm lead and 100 ppm arsenic' (page 7-26, 2nd paragraph).'* Neither the Lewis and Clark City-County Board of Health (Board) nor the Lewis and Clark County Commission (Commission) have done so. In fact, the Board, in a letter to EPA dated April 13, 2007 and included in the ROD documentation, specifically states disagreement with this soil cleanup level. This statement should be removed.

Similarly, on page 26 of the Summary of Public Comments and EPA Responses Regarding the Proposed Plan for Final Cleanup of East Helena's Residential Soils and Undeveloped Lands (in the Response Summary Section), the first bullet item contains the sentence, *"Once a Record of Decision is issued, Lewis and Clark County has stated that its proposed regulations will be enacted and administered. They are designed to minimize disturbances and reduce the indiscriminate transport of soil; however, they are neither difficult nor costly."* To clear the record, Lewis and Clark County has not stated that its "proposed regulations" will be enacted and administered. The Board at its April 2006 meeting did not agree to the proposed regulations, included in the ROD in the Response Summary Section, in April 2006. The Commission has not reviewed the proposed regulations and has never considered their adoption. As of the date of this letter, there are no proposed regulations being considered. The use of the term Lewis and Clark County adds confusion. It is not clear whether these discussions occurred with the Commissioners, the Board, or staff, (compare to the distinction between RCRA and CERCLA). They are different agencies with different authorities.

A statutorily authorized decision-making body, such as the Board or the Commission, must adopt regulations. Neither of these bodies has made decisions or public statements, which support the ROD statement. The assumption that the Board or the county will administer and enforce an existing proposed regulation is implied throughout the document and should be corrected (see page 12-5 for an example of this implication).

Vague and Conflicting Language

The Board needs more information on institutional controls (ICs) in order to move forward. Development relies on knowable and predictable requirements for land use, but the ROD is very unclear about what will be required to develop new lands. In some instances (page 12-10) language used in the ROD seems to define cleanup as voluntary if funding is not available. As an example:

The mission of the Lewis and Clark City-County Health Department is to improve and protect the health of all Lewis and Clark County residents.

Limited funding may be available to assist developers in further characterization of the property to be developed. If such funding assistance is not available, however, the ICs administrator will advise the developer or land owner of voluntary options allowed in accordance with this ROD for treating, capping or removing soil that exceeds the cleanup level for the new use. (2nd paragraph, last sentence).

The next paragraph goes on to discuss a requirement to meet all standards for the new use (mandatory language), and gives a listing of standards that may be considered (voluntary language).

Rewording of the first italicized paragraph would clarify the expectation and requirements. For example:

> Limited funding may be available to assist developers in further characterization of the property to be developed. Regardless of the availability of funding assistance, the ICs administrator will assist the developer or land owner in selecting from the list of cleanup options allowed in accordance with this ROD for treating, capping or removing soil that exceeds the cleanup level for the new use.

Rewording removes the confusion of whether cleanup is voluntary or required. The existing wording appears to give developers a choice of whether to clean up or not, depending on availability of funding.

Funding

The Board questions the adequacy of the funding provided by the responsible parties for the implementation and long-term support of ICs. Of concern to the Board of Health are comments made in the September 8, 2009 meeting with EPA and DEQ in which health department representatives were notified that the county has a "financial obligation" in East Helena and the "increase in the tax base" would provide the funding necessary to meet this obligation. As outlined in our comments of the Proposed Plan, the Board strongly states that the responsible party, ASARCO, should clean up contamination from the Asarco smelter, rather than shifting the cost to a health department already struggling to provide core public health services county-wide.

Clarify What the ROD Covers

Throughout the document, questions arise about what the specific components of Operable Unit 2 (OU2) are and what they aren't. Reviewing the ROD discussion of both Prickly Pear and the Wilson Ditch raises public health concerns that are not addressed adequately in the ROD. The Board would like to know who is taking responsibility for characterization and cleanup of what appears to be a significant source of metals - Wilson Ditch. If the focus of activities in East Helena is indeed shifting to RCRA from CERCLA, this should be stated clearly and EPA must clearly designate RCRA as the responsible party. This allows both the Board and the Commission to follow up on the public health implications of issues that are not addressed in the ROD without confusion over on the appropriate contact.

Page 5-20, Wilson Ditch discussion

The first paragraph is very confusing. It implies that water quality in the Wilson Ditch is <u>not</u> essentially the same as Prickly Pear above the plant, because arsenic and lead concentrations in particular are elevated – directly in conflict with the plain English of the paragraph. We must guess where the highest levels are, because it is not clearly stated or discussed. Is it the Upper Lake, the upper reach of Prickly Pear or Wilson ditch? Were samples taken? What reference can we consult to obtain the data used to make these statements? If Superfund OU2 is indeed looking at surface water, then this issue must be

clearly addressed in the ROD. Otherwise, surface water should immediately be transferred to RCRA for investigation.

The next paragraph indicates Wilson Ditch sediments are significantly high in lead and arsenic. This ditch is an actively used irrigation ditch and livestock have access to this water and can drink the water, at least "part of the year". Livestock access is not discussed. Is it a concern? Where is the irrigation water applied? Application of water with potentially elevated metals concentrations across large areas of agricultural land implies that we are spreading contamination, and increasing concentrations of contamination. Though the discussion suggests that the source of metals (stormwater from the plant site) has been eliminated, it is possible that the contaminated sediments of Wilson Ditch are a second source. Wilson Ditch sediments contain 2,658 ppm arsenic and 6,528 ppm lead at the highest levels (near the plant site). Is this an area of open flow through the ditch? Furthermore, high concentrations are found to a depth of 8". This appears to be a fairly significant source and is subject to constant movement through water flow.

Statements in the third paragraph on page 5-10 highlight the importance of the discussion on Wilson ditch and other ditches. The ROD notes, *"Sampling to date has shown that only approximately five properties have yard-wide average arsenic concentrations greater than 100 ppm arsenic in association with lead concentrations less than 1,000 ppm. These properties are located north of East Helena's city limits where historic ditches and channels are present."* The implication that ditches and channels are likely to contribute to elevated levels of arsenic, in the potential absence of lead, leads to the conclusion that the Wilson ditch also contributes arsenic to irrigated lands. With arsenic sediments at 2,658 ppm, the Board believes this ditch requires significantly more attention than it is receiving.

The 4th paragraph of this section indicates that a section of the ditch was cleaned up in 1993 and 1994. However, this is still an active irrigation ditch and runs openly through a portion of Manlove Subdivision and extends North of Highway 12. The point of diversion, the nature of the ditch's construction through the plant site, and other pertinent details are not discussed here. There is inadequate information to claim that exposure risk is not an issue with the Wilson Ditch.

Page 6-1, Section 6.2 Water Use

The ROD indicates DEQ has classified Prickly Pear Creek as a B-1 stream. However, beginning at the northeast corner of the West Fields, Prickly Pear is classified as Impaired (I) ((17.30.610, (1)(a)(ix), Administrative Rules of Montana. Impairment is due to sediment, nutrients, metals (particularly arsenic and lead), and dewatering. The Montana DEQ has issued a load reduction goal for Prickly Pear Creek on the impaired section beginning at the northeast corner of the West Fields in the Framework Water Quality Restoration Plan & Total Maximum Daily Loads for the Lake Helena Watershed Planning areas. The identified stream segment (MT411006_030) is within the Superfund planning area and is adjacent to an area identified as containing contaminated soils (West Fields).

The fact the draft ROD doesn't mention the impaired status of this stream is of concern and indicates that surface water has been ignored. This stream is used as a source of water for livestock, and it recharges the Helena Valley aquifer, a source of drinking water for thousands of people. While the ROD suggests that enhancement of riparian zones of Prickly Pear Creek may spur RCRA investigations and remedial actions, it is the potential for contaminated sediments, heavy concentrations of metals and interaction of surface water with ground water that should be of interest to both Superfund and RCRA. Of concern to us is the error of misclassification of this impaired stream and the potential for spreading contamination.

Page 2-21, 4th paragraph
"All treatment yielded vegetative loadings for lead and cadmium that exceeded National Research Council (NRC) forage concentrations chronically tolerated by livestock. However, vegetative arsenic and zinc loadings from all treatments were less than the NRC-identified levels tolerated by livestock. These results suggested that East Fields could be used as pasture for cattle for at least part of the year."

There is no discussion of the level of exceedances, or what "part of the year" means. Is that one month or perhaps six months? How can institutional controls be developed to manage this potential problem when we have no substantive information about acceptable levels of exposure?

Soil Levels
As described in the Board's comments on the Proposed Plan, the Board does not agree that the lead cleanup level for residential soils of 1,000 ppm is health protective. The Board disagrees with the approach used by EPA to establish the 1,000 ppm cleanup level, which is based on (1) blood lead data from East Helena and (2) a quantitative uncertainty analysis of the human health risk assessment during which several "model runs" were conducted using predictive blood lead models.

Additionally, the Board believes the Preferred Cleanup Alternative relies too heavily on institutional controls, including community education, which, in turn, minimizes the alternative's long-term effectiveness and permanence.

Summary

The Lewis and Clark County Commissioners and the Board of Health are committed to participating to the full extent available to us, in the successful development and implementation of institutional controls in the East Helena Superfund area. We rely on the finalization of the ROD to understand what those institutional controls may include. In summary,

- The ROD, as it now stands, does not contain adequate information to determine what an effective set of ICs may require.
- The existing draft IC regulation included in the ROD is inadequate to protect public health.
- Contradictory language in the ROD (some of which is illustrated above) makes unclear what EPA's intent is and brings into question the protectiveness of the selected remedy.
- The overlap between RCRA and CERCLA confuses the issue and tends to obscure the importance of other public health threats, like the groundwater arsenic and selenium plumes, the levels of contaminated soils in ditches and waterways and the possibility of their continued spreading, and, virtually unmentioned, the connectivity between groundwater and surface water and the potential for contamination of larger portions of the Helena valley alluvial aquifer.

The Board, Commission, and Health Department staff would like to continue to discuss and review the ROD with you and your DEQ staff so that we can continue to work toward a protective remedy in East Helena.

City of East Helena

ENVIRONMENTAL PROTECTION AGENCY

APR 04 2008

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April 1, 2008

John F. Wardell
Director
Montana Office of the US EPA
10 W. 15th St.
Helena, MT 59626

Dear John Wardell,

I am writing to request the EPA come to a resolution regarding the Record of Decision for the East Helena ASARCO site. The residents of the city have been waiting since last September when we were told a final decision would be made. We were then told it would be moved to December, and then March. Most recently, we have been told, it has once again been put on hold. It would seem that with all the years of scientific studies and information that has been gathered, we should be able to move forward to a Record of Decision. As the evidence from the blood lead levels demonstrate, we are well below the national average. It seems obvious that the remediation that has been completed, along with the education program, we have achieved what we were striving for, to ensure the health of the children of our community. The concerns of MTDEQ and Lewis and Clark City County Health Board are not reasonable. The action levels to which the yards and surrounding areas have been remediated are an adequate level. There is nothing to demonstrate that making these levels more stringent will achieve a greater level of success regarding the health of the children. Since our blood lead levels are lower than the national average and much lower than when East Helena was designated a Super Fund site, what is to be gained by changing the standards at this time?

The land that is known as K&R subdivision, where East Valley Middle School and several blocks of housing is now located had varying levels of lead, cadmium and arsenic. The ground was deep till plowed, mixing the soils with a good end result. This is a relatively inexpensive manner of treatment that is very effective. By utilizing this type of treatment, it made development of the area affordable, which in turn, led to affordable housing. This same type of treatment could be used on the land to the west of the city, known as Lamping field, as well as other undeveloped land surrounding the city. This property could give the city a "hand up" if reasonable methods of remediation can be used. If developers could purchase this property, the city is willing to annex the area, providing water, sewer and other city services. The location of this is ideal for development. The area closest to the highway could be used for commercial purposes, which could help to offset the loss of tax base to the city, as well as School District #9. The area to the north could be used for residential housing.

Post-it® Fax Note 7671 | Date 4/14/08 | # of pages ▶ 2
To Phil + Lesi | From Scott Brown
Co./Dept. | Co.
Phone # | Phone # 406-457-5054
Fax # | Fax # 303-274-6160

We aren't asking to have the rules bent or changed to accommodate the city. We are asking that the same standards that were initially placed continue to be utilized to the end of the project. Both MTDEQ and Lewis/Clark City County Board of Health were involved from the beginning. There is no logic in changing the standard at this time and nothing to be gained. We are in a holding pattern until there is a Record of Decision. We would like to move forward, looking to the future. This could involve Brownfield's grants, which we don't qualify to apply for, because we are designated a Super Fund site. We encourage you to continue to move forward to a final decision and not allow other entities to influence your decision.

Sincerely,

Terrie Casey
Mayor

CC: Carol Rushin

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
FEDERAL BUILDING, 10 W. 15th STREET, SUITE 3200
HELENA, MONTANA 59626

Ref: 8MO

April 17, 2008

Honorable Terrie Casey
Mayor
City of East Helena
P.O. Box 1170
East Helena, MT 59635

Dear Mayor Casey:

Thank you for your letter of April 1 in which you asked EPA to complete the East Helena Record of Decision (ROD), and reiterated the City of East Helena's support for the preferred alternative in EPA's East Helena Proposed Plan. I regret I have not been able to meet the previous target dates to complete the ROD. It has been approximately one year since the close of the public comment period for the Proposed Plan.

As you know, EPA and Montana Department of Environmental Quality (MDEQ) disagree over several aspects of EPA's preferred alternative in the Proposed Plan. EPA and MDEQ have met several times to discuss the areas of disagreement particularly the difference in the lead soil remedial action level. The ROD completion was delayed in hopes of an agreement being reached with the State of Montana which has not yet happened.

Next month, I will be sending the ROD to EPA Headquarters for its review and concurrence. After EPA Headquarters has reviewed the document and I make any needed adjustments, the ROD will be forwarded to MDEQ. At that time, MDEQ will complete its review, and I anticipate will be ready to make its decision about the selected remedy.

The above-described schedule means the ROD may not be finalized until late July at the earliest. I am committed to complete the ROD as expeditiously as possible and will update you periodically on its status. Please do not hesitate to call me at (406) 457-5001 with your questions or concerns.

Sincerely,

John Wardell
Director
Montana Office

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Montana Department of
ENVIRONMENTAL QUALITY

Brian Schweitzer, Governor

P.O. Box 200901 • Helena, MT 59620-0901 • (406) 444-2544 • www.deq.mt.gov

September 15, 2009

Carol Campbell
Assistant Regional Administrator
Office of Ecosystems Protection and Remediation
U. S. Environmental Protection Agency, Region 8
1595 Wynkoop St
Denver, CO 80202-1129

Re: Letter of Non-Concurrence for Operable Unit 2 ("OU 2") of the East Helena Superfund Site

Dear Ms. Campbell:

The East Helena Site was listed on the National Priorities List in 1984. The Environmental Protection Agency (EPA) and ASARCO signed an Administrative Order on Consent in 1991. EPA issued the first proposed plan in 1997, and the second in January 2007. Throughout these years, the evidence of the detrimental effects of lead continues to mount, and lead has become more strictly regulated by EPA on a national level.

Much of the evidence is summarized in EPA's October 2008 regulatory impact analysis of its proposed revisions to the National Ambient Air Quality Standards for Lead, which states, "Very importantly, the newly available toxicologic and epidemiologic information ... includes assessment of new evidence substantiating risks of deleterious effects on certain health endpoints being induced by distinctly lower than previously demonstrated Pb exposures indexed by blood-Pb levels extending well below 10 μg/dL in children and/or adults."

The Department of Environmental Quality (DEQ), cognizant of the ongoing research and national efforts for protectiveness from lead, continues to advocate a trigger level for all residences of 500 ppm. The DEQ trigger level would not undo EPA's removal action. Those residences addressed under the removal action have soil lead levels of less than 500 ppm, protective of human health and the environment.

But EPA's negotiated 1,000-ppm lead trigger level for existing residences should not be viewed as mission accomplished. As made clear by the National Contingency Plan, removal actions, by their nature, "are distinct from remedial actions in that they mitigate or stabilize the threat rather than comprehensively addressing all threats at a site." 55 Fed. Reg. 8666, 8695 (1990).

The 500-ppm trigger cleanup level, unlike EPA's 1,000-ppm level, would be consistent with the Integrated Exposure Uptake Biokinetic model and current federal lead policy and guidance. The state of Montana has been clear about its preference for the more protective clean up level.

As for funding of further actions for lead contamination at OU 2, it is unfortunate that publication of EPA's 2007 Proposed Plan, based on the 1,000-ppm trigger level, played a large role in limiting EPA's and DEQ's future cost recovery against ASARCO in the bankruptcy arena. However, this should not preclude the agencies from further actions needed for protectiveness, nor should it lead to transferring the fiscal burden onto local government and landowners.

The points made by DEQ in its April 12, 2007, comments on the Proposed Plan continue to be valid, and apply to the ROD as well.

In addition, the Section 10.2.8, "State Acceptance," is required, in its entirety, to read:

> "The State's consistent interpretation that a lower lead in soil cleanup level is needed to be protective, as well as the State's disagreement with other facets of EPA's OU 2 remedy, influenced the State's final decision not to concur. DEQ's concerns pertaining to OU 2 focus on concerns as to the remedy's protectiveness as well as the remedy's implementability. DEQ considered public comment received on the Proposed Plan prior to making its determination as to State concurrence. The State's letter pertaining to concurrence is provided in Appendix D."

DEQ looks forward to working closely with the EPA, responsible parties, local government, landowners, and the public in ensuring a clean and healthful environment for the citizens of the State, and significantly, for those who live or work in East Helena and the associated counties.

Sincerely,

Richard H. Opper
Director