

APPENDIX C

RESPONSIVENESS SUMMARY

Big River Mine Tailings Superfund Site

OU-1

Responsiveness Summary

This Responsiveness Summary has been prepared to present a summary of comments and EPA's responses to comments regarding the Proposed Plan for the Big River Mine Tailings Superfund Site, Operable Unit 1. The Proposed Plan was released for public comment on July 22, 2011. The public comment period ended on September 21, 2011. A public meeting was held on August 4, 2011. A transcript of the public meeting was prepared and is part of the Administrative Record. The response to comments offered in this Responsiveness Summary should be considered collectively. EPA attempted to strike a balance between repeating responses to recurring elements that appeared in many individual comments, and providing a detailed response to each element in a single location. This Responsiveness Summary has been prepared with the goal of assuring the public clearly understands the EPA's position on the issues raised in the comments received, and the rationale that supports EPA decision-making for the Selected Remedy for the Big River Mine Tailings Superfund Site.

The Responsiveness Summary consists of the following sections: Comments/Questions received during the public hearing on August 4, 2011; comments received from the Missouri Department of Natural Resources (MDNR); comments received from the general public; comments received from political subdivisions of the state of Missouri; and comments received from business and industry. A complete set of comments by business and industry is attached.

A. Comments/Questions Received During Public Hearing on August 4, 2011

The following questions/comments concerning the proposed remedy were raised during the public meeting held at the Mineral Area College on August 4, 2011. Other questions and comments raised during that public meeting which did not directly concern the proposed plan for OU-1 are not included in this responsiveness summary. There appeared to be acceptance of the Proposed Plan by those in attendance.

QUESTION: From Mr. Norm Lucas. I was just curious as to how the decision was arrived at to go with the 24 inch deep cover rather than the 12 inch cover since all the areas with yards appear to be in cities that have planning and zoning where institutional controls could include some things about digging deeper than 12 inches.

EPA RESPONSE: It was based on a subsurface investigation that was done which was part of the feasibility study. It showed by going down further than 12 inches, we could eliminate the need for institutional controls. Actually about 98 percent of the properties that were evaluated were less than 1,200 at 24 inches and we felt that that would be the best thing to do. We wouldn't have the residual risks.

QUESTION: From Mrs. Elois Hartsel. My name's Elois Hartsel. I was just curious. How are you going to get the message out to the families and the parents that the children need to be retested or tested again?

EPA RESPONSE: We are going to do community outreach along with the local health department. Not just the local health department, also the Agency for Toxic Substances and Disease Registry along with the state Health Department and the local health department to do community outreach and try to get more blood-lead analyzed in the county. We will focus on that next year.

QUESTION: From Mr. Larry Mathis. My name's Larry Mathis and I was wondering why the blood levels were just limited to children.

EPA RESPONSE: We see the most health effects in the children as far as permanent damage. Ages seven and less is when most of the development is going on in a child, and that's where lead usually has the most effect. That's the focus here. Adults can definitely get their blood-lead analyzed as well, but we focus on the younger children because that's where we see the main health effects. Now, if you want to get into more detail about that, there's a few experts here that can give you more detail that are from the health department.

QUESTION: From Mr. Bobby Hartsel. I'm Bobby Hartsel. I was just wondering is it going to be a mandatory type cleanup, or what type of cleanup are you proposing like voluntary?

EPA RESPONSE: We will request access for sampling and we have to request access for cleanup as well. That's the first step we take.

QUESTION: From Mr. Bobby Hartsel. So what if my neighbor doesn't want to get his done, and I get mine done, and it all blows back towards me? What's going to keep it from blowing back on me?

EPA RESPONSE: Well, then it gets complicated and that's actually a legal issue, and our site attorney, Julie, will be working on that. I do see your point, and that can be an issue. We've had that happen before, and we do our best to try to keep it from going on. That's really all I can tell you right now though until we get the legal issues broken down. We hope that people will grant us access, and they usually do.

EPA Follow Up Response: CERCLA section 104 gives EPA the authority to order access.

QUESTION: From Mr. David Hull. But didn't they run into a problem like at Lake Timberline of people not wanting them to come on their property? I mean, they had an issue out there of contamination, and some people didn't want to take care of the problem.

EPA RESPONSE: I'm not sure about Lake Timberline because I don't work on that site, but as far as St. Francois County in the past, just to give you an idea, we've had an 80 percent success rate for getting access, which is pretty good. I mean, that's better than a lot of the sites we've worked on in the past. So usually we'll get access.

QUESTION: From Ms. Donna Bidgood. It's been at least rumored that in the municipality if we don't grant access that when the property is sold, at that point, the city may require that that property be remediated at our -- at the owner's cost or at the buyer's cost, only because I think you're going to get compliance if that's true at all and the people --

EPA RESPONSE: I don't know about the rumor. I haven't heard anything.

QUESTION: Ms. Shirley Politte. My name's Shirley Politte, and I did have my yard done a few years ago. In fact, you have it on your picture up there, the one that was completed with the grass. That was my yard, and they did tell me -- I said, "What if I don't let you do it?" And he said, "If you don't, then we will have a lien over at the court house, and if your house, your property, is sold, you could have to replace it then or" --

EPA RESPONSE: It's possible it could come back on the landowner if you don't have it done. It's a good idea to have it done.

QUESTION: Mr. David Hull: Does your property hold some type of paperwork once it's done, and then you have to do this disclosure type thing if you decide to sell, or what is it?

EPA RESPONSE: I work on the excavation, the remediation part of it. What happens is we will come to your property and do a pre-remediation site sketch sheet. We will have a picture of your yard showing the existing contamination at the existing grade. We take photos of everything, and do a pretty complicated site walk with you also to do an inspection of your property to make sure that we don't damage anything. When we get through, we'll excavate. Then we'll take our samples at the base of the excavation. If you're clean at 12 inches, then we'll stop. We'll have that data with your post-remediation site sketch, and you'll have all that data as well. That will be yours to keep. Every piece of data we pick up at your property has to be transferred to you. And you'll have all that in your record, and we keep it on record too.

QUESTION: From Mr. Norm Lucas: Did I understand correctly that if the contamination ends at 12 inches of depth, the excavation also stops at 12 inches?

EPA RESPONSE: Right.

QUESTION: From Mr. Norm Lucas. So the 24 inch in Alternative 3 is only in the necessary cases?

EPA RESPONSE: Right. It's not automatic. We haven't come up with an exact work plan for this work. We may do a six inch lift and test and go another six inch lift. That's what we've done at past sites.

QUESTION: From Mr. David Hull. Your remediation process, help me understand. How does that eliminate water leaching into the groundwater affecting everyone's wells and even though this mine site is hundreds of yards from my home, I still have a well there. And there's still livestock in that area and things like that.

EPA RESPONSE: What we typically see in the wells in St. Francois County is a high level of dissolved zinc that comes off these piles. We're trying to put treatment systems in. They're passive bio-reactors that are basically wetlands, and we have them at the Elvins pile, and then we're going to build one at Leadwood as well for dissolved zinc. What we don't see is dissolved lead in the water, not very often at least. So I think the 189 wells, plus all the municipal water supplies in the county have been tested, and we haven't seen elevated lead in hardly any of them. So it's not been a major concern. There is a lot of limestone around here. So that keeps the water with a higher pH and keeps the lead from dissolving.

QUESTION: From Mr. Bobby Hartsel. If they decide to go with this proposal and stuff, say, for the city of Bonne Terre, where would they take the waste to?

EPA RESPONSE: Most all the waste in this proposed plan is going to go to either Leadwood or Desloge.

QUESTION: From Mr. Bobby Hartsel. So the stuff that they took from like Lake Timberline, it went to Bonne Terre, right?

EPA RESPONSE: It went to the Bonne Terre east side. That was just for that Lake Timberline stuff because it was so far for them to travel down to Desloge and to Leadwood. And there was an area over there that needed the cover anyway, and that's why we decided to place it over there.

QUESTION: From Mr. Bobby Hartsel. So what's going to keep it -- that contamination from getting into any of the wells basically?

EPA RESPONSE: Well, it's not gotten into any wells yet around Bonne Terre, and that's our primary reason for doing this, which stabilized it in place because it doesn't tend to leach into the water.

QUESTION: From Mr. Bobby Hartsel. Why would the EPA step up to the plate to take care of the responsibility that's really not theirs?

EPA RESPONSE: We are stepping up to the plate based on information we have, and as far as any types of negotiations with responsible parties, those will occur in the future. We'll have to go to the table with any potentially responsible parties.

QUESTION: From Ms. Shirley Politte. All right. I was born and raised here in Elvins. I played with lead, chunks of lead. My dad worked on the drills. He brought home ores, the rock, where they had drilled for lead. I played with those. We had lead paint in the house, and nothing was ever mentioned about it being contaminated. I guess I didn't get it because I'm still here and I'm 72 years old. So everybody is not going to get it.

EPA RESPONSE: You're right. It won't affect everybody. But it does affect some people.

QUESTION: From Ms. Donna Bidgood. I too would like to say it's not totally out of proportion because same experience. We had a sandbox that was that chat from the chat dump. Our dad would go and shovel buckets full of it, and we would climb on it. And we swam in that water coming directly out of that overflow, you know, with that in it. And while I don't want to minimize the danger or have any other children exposed more than necessary, I don't think it's a cause for panic among those of us who did survive it to this point.

EPA RESPONSE: That's why we address the highest risk first. The source piles are getting addressed and the yards are where the children are spending most of their time and that's where the most likelihood of getting an elevated blood lead.

QUESTION: From Mrs. Pamela Watkins. We have one more. This is Pam Watkins, and I'm actually a renter. I haven't been here that long, and my question on this is, what would happen if you come and test my property and I would like for you to do the cleanup, but my landlord says he doesn't want it done?

EPA RESPONSE: It's an agreement with the landowner.

B. Comments/Questions Received from MDNR

The MDNR concurred on the preferred remedial action alternative in the Proposed Plan by letter dated August 2, 2011. This letter also included two comments that merit formal recognition and response.

MDNR Comment #1: Operable Unit 01 (OU1) includes Residential Action and Source Control; however, there is no language in the Proposed Plan that addresses Source Control as part of the remedial action for OU1. The PP does not contain any remedial action objectives for Source Control. The Record of Decision (ROD) should evaluate whether and/or to what extent the non-time-critical removal action achieves Remedial Action Objectives (RAOs) for OU1. An evaluation to determine whether or not additional remedial action work would be required on the pile(s) itself to meet RAOs should be included.

EPA RESPONSE: The comment refers to the eight source areas of mine waste. Of these, the Desloge (Big River), Leadwood, Elvins, Bonne Terre and Hayden Creek piles or areas have been stabilized. Work is ongoing at the National and Federal piles. The Doe Run pile will be stabilized under a future, as yet undetermined, action. With the exception of the Doe Run pile, the piles have been addressed under Removal Authority. EPA does not agree that the piles should be addressed as part of the ROD because the focus of the remedial action is lead contaminated mine ore processing waste in residential areas. Source control of the piles will be evaluated as part of the requirements of the existing orders for the Removal Actions.

MDNR Comment #2: MDNR feels that cleaning up the residential yard soil to a level of 400 ppm should be included as a Remedial Action Objective (RAO).

EPA RESPONSE: The RAO for the residential property soils at the Site is to:

Reduce the risk of exposure of young children (children under seven years old) to lead such that an individual child or group of similarly exposed children have no greater than a 5 percent chance of exceeding a blood lead level of 10 µg/dL.

Based on Site-specific information, EPA's IEUBK model predicts that a young child residing at the Site will have greater than a 5 percent chance of having a blood lead level exceeding 10 µg/dL if the lead soil concentrations to which he or she is exposed are above 400 ppm under the assumed exposure conditions. Thus, 400 ppm lead in soil will be the cleanup level of the remedial action as measured in the bulk soil fraction using an XRF instrument.

The RAO is the primary goal. To achieve this goal, EPA will use 400 ppm to trigger the remedial action at each property.

C. Comments/Questions Received from the General Public

No comments or questions were received from the general public other than those listed in Section A above.

D. Comments/Questions Received from Political Subdivisions of the State of Missouri

No comments or questions were received from the political subdivisions of the state of Missouri.

E. Comments/Questions Received from Business and Industry

Comments were received from The Doe Run Resources Corporation (Doe Run) on September 21, 2011. A number of the issues raised in these comments were repetitive, and in some instances EPA addressed an issue only once in its response. Portions of Doe Run's comments are set out below followed by EPA's response. The complete set of Doe Run's comments is attached.

Comment 1. Page 2, Paragraph 2 continuing onto Page 3, Paragraph 1.

EPA has identified eight sources of mine waste in the former mining area of St. Francois County.² Since 1994, Doe Run has investigated and stabilized six of these large tailings Piles and a portion of the small Hayden-Creek pile to minimize any further releases from those Piles. We understand EPA plans to address the Doe Run Pile, not associated with The Doe Run Resources Corporation, as part of another operable unit. Beginning in 2000, Doe Run began sampling and, where appropriate, remediating residential properties and child high-use areas (CHUAs). In 2004 Doe Run began remediating all residential properties and CHUAs with yard soil concentrations greater than 400 ppm located within 500 feet from each of the six major mill piles, 1,000 feet from the four identified smelters and 100 feet from the mine shafts identified in the Remedial Investigation. Additionally, Doe Run sampled and remediated yards where elevated blood-lead levels in children (EBLs) were detected, regardless of their distance from the Piles. As of January 2011, Doe Run has sampled a total of 2,057 residential properties and child high-use areas, and conducted total or partial removals at 586 of those properties.³ Finally, Doe Run conducted the Focused Remedial Investigation efforts and the prepared the Feasibility Study as directed by EPA. Doe Run proactively did this work in response to EPA's requests regardless of the lead source.

Concurrent with these efforts, the State and County Departments of Health launched extensive educational programs both in the area and statewide directed to risks associated with lead and how to reduce exposure, particularly of young children, to lead from all sources, including in particular lead-based paint (LBP). As shown in Figure 5, infra, the occurrence of EBLs in St. Francois County has fallen substantially since 1997. In fact, the Missouri Department of Health and Senior Services (MDHSS) reports those occurrences of EBLs in St. Francois County have been less than 5 percent since 2006. In 2010, the rate of occurrence was reported to be 1 percent.⁴ In other words, the rate of occurrence in St. Francois County has already been reduced to a level consistent with EPA's Remedial Action Objective, and to a level less than the national average of EBL.

EPA RESPONSE:

EPA agrees that Doe Run has completed investigations of the following six large mine waste/ tailings piles in St. Francois County: Desloge; Bonne Terre; Elvins/Rivermines; Leadwood; National; and Federal. EPA also agrees that Doe Run has completed stabilization of the Desloge; Bonne Terre; Elvins/Rivermines; and Leadwood piles. EPA does not agree that stabilization is complete at either the

National or Federal piles. The work at Desloge; and Bonne Terre; as well as the upcoming work at Federal, were undertaken pursuant to a negotiated consent order. The work at Elvins/Rivermines; Leadwood; and the work to be completed at National, were all pursuant to Unilateral Orders issued by EPA.

EPA agrees that Doe Run entered into consent agreements in 2000 and 2004 for a soil testing and removal program and blood lead testing at the Site. EPA agrees that Doe Run entered into a consent agreement in 1997 to perform the RI/FS. The RI was completed in 2006; and the FS was completed in 2011.

EPA agrees that blood lead levels in St. Francois County have declined as a result of these actions. However, EPA does not agree that the reduction of reported blood lead levels means that work at St. Francois County is complete. The fact that the rate of elevated blood lead levels (EBLL) is declining is one important indicator that the actions being taken to address lead contaminated properties in St. Francois County are having the desired effect.

However, a measured EBL rate of 1 percent in St. Francois County is not consistent with EPA's Remedial Action Objective. A measured EBL rate of 1 percent means that of all children who are tested for blood lead levels in St. Francois County, 1 percent have a blood level of greater than 10 ug/dl. EPA's remedial action objective is based on a soil lead concentration that would result in a probability that no child or similarly exposed child would have greater than a 5 percent chance of having a blood lead level greater than 10 ug/dl based on the IEUBK modeling. The remedial action objective is not related to the total percentage of children with elevated blood lead levels; it is related to the probability that a child would have an elevated blood lead level if that child is exposed to lead contamination in residential soil. EPA remedial action objective does not mean that if less than 5 percent of children in St. Francois County have an elevated blood lead level then the remedial action objective is met, as Doe Run seems to suggest.

It should also be noted that ATSDR's position is that there is no safe lead level in blood.

Comment 2. Page 3, Paragraph 2:

This Operable Unit presents highly complex issues with regard to the nature and extent of the contamination and the potential risks resulting from it. These issues relate to the lack of correlation between EBLs and identified mine waste source areas; the large volume of mine chat and tailings and their varied uses; the widespread, yet unaccounted-for occurrence of LBP in residences in the area; and the abundance of naturally occurring lead in the area. These complex issues warrant very careful scrutiny in determining the appropriate use of CERCLA statutory authorities and resources.

EPA RESPONSE:

The 1997 Lead Exposure Study concluded the following:

- 17 percent of the children tested in the Response Area (around the piles) had EBLL's. The Response Area was compared to a control area (Salem, MO.) with regard to similar aged housing stock and prevalence of Lead-Based Paint (LBP). In the control area, EBLL rates were 3 percent. This finding triggered the actions on the mine waste piles and Halo area.

EPA does not agree that there is no correlation between EBLs and identified mine waste source areas; nor does EPA agree that the occurrence of lead based paint in residences was "unaccounted-for" in the investigation of the Site and development of the remedial action. The Human Health Risk Assessment evaluated indoor lead dust in residences.

The Conceptual Site Model included in the ROD as Figure 6 evaluated the indoor dust pathway. This pathway was found to be complete and the concentration of lead in the indoor dust includes a contribution from Lead-Based Paint (LBP). The dust sampling effort also justified using the default parameters of the IEUBK Model. EPA also conducted a Lead Speciation Study on residential soils and the tailings piles of St. Francois County. The Lead Speciation Study concluded the following:

- Lead in residential soils from the Big River area were primarily the result of activities associated with mining/milling operations and included some minor contribution from pyrometallurgical activity and LBP.
- The strong, galena-cerussite association found in the residential soil samples indicated that the tailings piles were the most likely source of contamination, however; small fractions (<2 percent RM Pb) of the bulk lead are also traceable to LBP and some pyrometallurgical activity (smelting).
- Neither LBP nor gasoline appeared to be significant lead contributors to the Site.

Based on the Lead Speciation Study, LBP was not considered a significant source of lead in the mid-yard.

On a particle concentration weighting basis, the median proportions observed in indoor dust taken from 235 residences were 21 percent from mining waste, 23 percent from paint, 8 percent from soil, and 29 percent could not be identified. EPA recognizes that LBP is part of the overall exposure but mine and smelter wastes are the most significant contribution to the overall exposure in residential soil at the Site.

Comment 3. Page 3, Paragraph 3 continuing onto Page 4:

Doe Run maintains that in a rush to complete the Feasibility Study EPA has failed to consider pertinent analysis of the data provided by Doe Run. In issuing its Proposed Plan with undue haste, EPA made unfounded and arbitrary assumptions regarding the source of contamination, disregarded serious questions regarding the associated potential risk, and disregarded the limits of EPA's CERCLA authorities to respond to conditions at the Site. As a result, EPA now proposes a remedy that 1) is beyond the scope of its CERCLA response action authorities to the extent it addresses naturally-occurring contamination, lead from building materials, including LBP, consumer products in consumer use, and normal fertilizer use; 2) has not demonstrated to be necessary to protect human health and the environment; and 3) is otherwise inconsistent with Section 121 of CERCLA and the National Contingency Plan ("NCP"). Accordingly, Doe Run urges EPA to take additional time as needed to carefully evaluate the source of the contamination, evaluate the extent to which unrelated sources, including sources over which EPA does not have CERCLA response action authority, are the true cause of EBLs, and more carefully evaluate the true nature of any remaining risk to human health resulting from mining activities. Only then can EPA develop a remedy that responds more directly to any remaining risk, presents a better balance of trade-offs and is consistent with CERCLA and the NCP.

EPA RESPONSE:

EPA does not agree that the investigation of the Site was "rushed" or that the Proposed Plan was issued with "undue haste." Doe Run entered into a consent agreement to complete the RI/FS in 1997. The work on the RI was not completed by Doe Run until 2006. Doe Run did not complete the FS until 2011, some fourteen years later. EPA does not agree that it is a rush to complete the Record of Decision some five years after the RI completion.

Nor is it true that EPA acted with undue haste in its work in St. Francois County. The development of the Proposed Plan is a result of over twenty years of experience in St. Francois County. When EPA began investigation of the Site, the mine waste piles were literally mountains of mine waste that dwarfed the towns of St. Francois County. The mine waste piles were uncovered and access to the mine waste piles was unrestricted.

EPA does not consider the proposed date of the Record of the Decision of September 30, 2011, to be an accelerated pace. Observed air releases of lead contaminated tailings dust from the mine waste areas in St. Francois County have been documented by EPA as early as 1988 (see Photos from the Listing Site Inspection included as Attachment A). The dust from the piles created a suspended particulate plume of lead contaminated dust that extended offsite for up to one mile. These observed air releases and the releases of lead contaminated mine waste into the Big River were the primary supporting documentation for the eventual listing of the Site on the National Priorities List.

EPA prioritized the work to stabilize the six major tailing piles using removal authority to expedite the work due to the ongoing exposures created by these air releases and the exposure to their deposition in residential areas in interior dust and surface soils. For decades the owners and former operators of the mine waste piles, including Doe Run, were well aware of these ongoing air releases as evidenced by the snow fencing shown in the photo included in Attachment A, which was used to reduce the migration of the lead contaminated fine tailings to nearby communities.

EPA carefully evaluated all data in the development of the Proposed Plan and followed the appropriate steps in selecting the final remedy for Operable Unit-1 (OU-1). EPA's decision is based on the risk that is associated with lead-contaminated residential soil at the Site. A Human Health Risk Assessment was conducted at the Site that, along with Doe Run's Site-Specific Blood Lead Study, showed an unacceptable risk at residential areas where lead contamination was present at or greater than 400 parts per million lead (ppm).

The fact that the rate of elevated blood-lead levels is declining is one important indicator that the actions being taken to address lead contaminated properties in St. Francois County are having the desired effect.

However, a measured EBL rate of 1 percent in St. Francois County is not consistent with EPA's Remedial Action Objective. A measured EBL rate of 1 percent means that of all children who are tested for blood lead levels in St. Francois County, 1 percent have a blood level of greater than 10 ug/dl. EPA's remedial action objective is based on a soil lead concentration that would result in a probability that no child or similarly exposed child would have greater than a 5 percent chance of having a blood lead level greater than 10 ug/dl based on the IEUBK modeling. The remedial action objective is not related to the total percentage of children with elevated blood lead levels; it is related to the probability that a child would have an elevated blood lead level if that child is exposed to soil lead contamination in

residential soil. EPA remedial action objective does not mean that if less than 5 percent of children in St. Francois County have an elevated blood lead level then the remedial action objective is met, as Doe Run seems to suggest.

Comment 4. Page 4, Section I.

I. EPA Erroneously Assumed the Piles/Mining Waste are Only Source and Principal Threat.

The NCP requires that EPA properly scope the project to ensure the RI/FS is properly designed. 40 CFR § 300.430(a)(2). "The investigative and analytical studies should be tailored to site circumstances so that the scope and detail of the analysis is appropriate to the complexity of the problems being addressed. 40 CFR § 300.430(b) EPA is required to develop a conceptual understanding of the site, or a conceptual site model. 40 CFR § 300.430(b)(2). Section 104(a)(3)(A) and (B) of CERCLA 40 CFR § 300.430(b)(1) and (2) specifically prohibit EPA from responding to a release of a naturally occurring substance or products that are part of the structure or result in exposure to residential buildings or business or community structures. Additionally, Section 101(9) and (22) of CERCLA exclude consumer products in consumer use and the normal use of fertilizer from EPA's response action authorities.

EPA RESPONSE:

EPA does not agree that the RI/FS was not properly designed. Nor does EPA agree that the lead contamination is naturally occurring. Further, Doe Run's recent depth data study refutes the claim that the contamination is naturally occurring. The Subsurface Soil Report found, when sampling was extended to depths greater than 12 inches that the contamination declined with depth in the vast majority of cases (98 percent) and was not present when native material was encountered. Much of the contamination was in the form of tailings and the result of mining and milling operations and not naturally occurring. It is well-documented in the RI that significant amounts of mine wastes have been mechanically moved for use on residential properties as well as by local communities for traction on icy roads. A recent EPA Removal Action at Central Middle School was indicative of this finding. When the obvious tailings material was removed to the native soil horizon, the lead levels dropped significantly. Additionally, the background lead level used for comparison in the RI for St. Francois County soil was 62 mg/kg, which is much lower than the proposed cleanup level. The lead levels found in the Response Area are considerably higher than the background levels.

Comment 5. Page 5, paragraph 2 and 3:

In its conceptual site model, EPA identified historic mining wastes as the only source of contamination at the Site.⁵ In violation of its obligation under the NCP, the Agency erroneously failed to consider alternative sources for contamination in yards, including LBP, other consumer products, the normal use of fertilizer and naturally-occurring lead. While EPA's conceptual site model does recognize human movement of chat from the piles, much of that use, including but not limited to the use of chat as agricultural lime, represents consumer use of a consumer product and/or normal fertilizer use over which EPA has no authority to conduct a response action.

In its Proposed Plan, EPA ignores these sources, stating that Operable Unit 1 includes "lead-contaminated surface soils present at residential properties across the site that have been contaminated as a result of migration of metal-bearing materials from past mining practices via natural erosional processes, windblown mine waste and human activity." The Proposed Plan "addresses the risk to

human health and the environmental resulting from exposure to residential soils contaminated with lead mine waste." It further states, "(t)he eight mine waste areas are the source deposits and constitute the principal threat to human health and the environment," and that "(t)he sources of most of the lead contamination in the site are the large mine waste piles...." In fact, EPA's conceptual site model overestimates the extent of air dispersion from the Piles. This, coupled with EPA's arbitrary disregard of other sources for lead, result in a remedy that reaches outside the scope of EPA's response action authorities and without regard to the true cause of the risk the remedial action is intended to address.

EPA RESPONSE:

EPA disagrees with this comment to the extent that it states that EPA violated its obligations under the NCP to consider alternative sources of lead contamination in yards. The investigation of the Site supports EPA's finding that the primary source of lead contamination in residential areas is the large mine waste piles.

The listing of the Site on the National Priorities List in 1992 was based on the observed release of wind-blown tailings creating a suspended plume of lead contaminated fine particles migrating to the town of Desloge, Missouri (see Attachment A). The Desloge (Big River) pile and the other mine waste piles were the primary sources of residential lead contamination via wind, water, and anthropogenic movement of material. The uncontrolled migration through wind and water erosion and the uncontrolled mechanical movement of chat and tailings from the mine waste areas and piles does not constitute a consumer product in consumer use. These piles were considered the primary source due to uncontrolled movement of chat and tailings. Specific types of migration are listed below:

Transport via wind

During the January 1988 Site reconnaissance for the HRS Scoring, blowing of lead-laden dust was observed to be a serious problem. A dust plume originating from the Site appeared to be transporting dust at least one mile to the southeast. Wind speeds on that day included gusts up to 35 miles an hour. A photograph of the tailings blowing off-site is included in Attachment A.

Transport via water

Erosion to the Big River and its tributaries has been an issue with all the piles. The Site was listed on the National Priorities List due in part to an estimated 50,000 cubic yards of tailings that slumped into Big River during a high rainfall event in 1977. Tailings are presently in continuous contact with the Big River and its tributaries. The mine waste material has been transported downstream into the floodplain, where it can affect human and ecological receptors.

Transport via anthropogenic movement

The mine waste piles have been a continuous source of mine waste contamination via anthropogenic movement. Mine waste was used for traction control during the winter, agricultural lime, and aggregate. Access to the mine waste source piles was unrestricted for many years. Additionally, Doe Run allowed and profited from the inappropriate use of contaminated mine waste materials even though it was aware of the lead content and its potential negative impacts on human health and the environment. Despite the fact that the Site was listed on the National Priorities List in 1992, Doe Run did not cease its sale of mine waste until it was ordered to do so by EPA in 2003.

Other Sources

A Site specific speciation study was done on residential yards which showed that in the mid-yard areas, <2 percent of the lead in soil samples could be attributed to LBP. Other sources such as leaded gasoline could have contributed a small amount in the road-side areas, but were not a significant factor in the mid-yard areas.

EPA's response action authorities are intended to address residential and child high-exposure areas that are above the Site specific action level determined by Doe Run's Site-specific Blood Lead Study and the HHRA.

Comment 6. Page 6 Section A. continuing to the first Paragraph of Page 8:

A. The RI Data Demonstrates that Air Dispersion Releases from the Piles are Limited to 200 Feet, and any Risk Associated with These Releases already have been Protectively Addressed.

EPA's first technical error is its assumption that wind dispersion from the Piles resulted in widespread contamination. The Proposed Plan states, "The mine waste ha(s) contaminated soil, sediment, surface water and groundwater. Mine waste also has been transported by wind and water erosion and manually relocated to other areas throughout St. Francois County. It has also been reported that mine waste has been used on residential properties for fill material and private driveways, used as aggregate for road construction."

1. RI data demonstrates that air dispersion releases from the piles are limited to a 200-foot area surrounding piles.

No studies conducted to date show a correlation between the residential properties yard soil lead concentrations and the processes of wind and erosion from the piles. As part of the Focused RI (NewFields 2006), the impact of particulate deposition from the mill waste piles was investigated. Shallow soil samples were collected along upwind transects and downwind transects at five large piles. Lead concentrations in near-pile soils in the downwind transects were found to be higher than background concentrations in a narrow "affected" zone about 200 feet wide around the piles, and then averaged beyond the 200 feet 180 mg/kg lead.

*In concert with the RI near-pile sampling, EPA requested Idaho National Engineering and Environmental Laboratory (INEEL) to perform air dispersion and deposition modeling of airborne lead associated with mill waste piles, **Air Dispersion Modeling of Mine Waste in the Southeast Missouri Lead Belt** (Abbott 1999). The air dispersion model was used to predict maximum lead concentrations in air and downwind soil lead concentrations, and to place the downwind transects. The model and soil sample results were matched and used to predict geometric mean lead concentrations assuming 80 years of deposition accumulating in a 2-inch soil column already containing 65 mg/kg lead. Predicted lead concentrations range from 300 – 500 mg/kg within 200 meters of the mill waste piles, and from 125 – 175 mg/kg out to 1 kilometer. The model-predicted soil lead concentrations apply only to the upper two inches of soil and to "generally undisturbed surface soils which have not been subjected to significant tillage, excavation, landscaping or flooding." (Abbott 1999). The model-predicted soil concentrations are generally consistent with the near-Pile soil sampling results. (Abbott 1999, NewFields 2006).*

It is also important to note that lead ambient air emissions in the Site area have been monitored for many years by Doe Run and other government agencies, beginning before the Piles were stabilized. Doe Run operated the "Big River Network" in the Site area from 1996 until 2005. The monitored lead ambient air concentrations for all monitors were well below the then applicable 1.5 ug/m³ lead NAAQS standard and in most all respects were also below the now much more stringent 0.15 ug/m³ lead NAAQS standard. More recent air monitoring conducted by Doe Run and MDNR within the Site area show consistent compliance with the 0.15 ug/m³ standard.⁶

These predicted soil lead concentrations do not explain the observed lead concentrations in yard soils. In fact, lead concentrations averaged above 700 mg/kg in the residential yard sampling programs conducted. Therefore, the Focused RI concluded that particulate deposition of lead from the mill waste piles was not the major contributor to lead in yard soils.

EPA RESPONSE:

EPA agrees the elevated lead levels in St. Francois County cannot entirely be attributed to wind-blown mine waste, but it's evident that wind-blown mine waste is a very significant factor. It is evident from the speciation study and by visual observation that the primary source of lead exposure is from the mine waste. The Record of Decision will address soil that has been impacted by mine waste. The RI showed that the lead levels were elevated well beyond 200 feet from the piles. For instance, the Bonne Terre East transect had lead levels of up to 376 mg/kg at 550 feet from the pile. The Desloge East transect had lead levels of up to 447 mg/kg at 1,150 feet from the pile. The Elvins Northeast transect had lead levels of up to 411 mg/kg at 650 feet from the pile. Some of the piles showed decreased contamination beyond 200 feet from the piles, but in most cases transects had lead levels above the background lead level of 62 mg/kg (mean concentrations of 180 mg/kg).

Comment 7. Page 8, Subsection 2.

2. Interim Action and Halo Removals Reached Beyond Potential Risk Posed by Air Dispersion from Waste Piles.

EPA RESPONSE:

EPA disagrees with the comment because the evidence shows that average residential soil lead contamination is higher in the Halo, which by definition is closer in proximity to the mine waste piles. The average soil lead concentration in the Halo was 718 mg/kg lead, which is well above background concentrations for St. Francois County.

Comment 8. Page 9, Subsection 3 continuing onto Page 11.

3. Interim Action and Halo Removal Data Shows No Correlation Between Lead Levels and Proximity to Piles.

Figure 1 presents the average yard soil lead concentrations relative to distance to the closest Pile. This figure demonstrates that there is no correlation of yard soil lead concentrations to the Piles. Furthermore, Figure 2, drip zone soil lead concentrations relative to distance from the closest Pile, also shows no correlation or trend indicating that the drip zone lead concentrations likely are not derived from an airborne source.

Sampling of the drip zone soil and screening for outdoor lead-based paint (LBP) conducted during the Interim Action was reported in the Removal Action Report for Interim Action.⁹ The report stated that drip zone soils would be greater than 400 ppm lead in 93 percent of the homes with measurable outdoor LBP. 33 percent of those homes' drip zone soils would be greater than 2,000 ppm (NewFields 2004).

EPA RESPONSE:

EPA disagrees with the comment because the evidence shows that average residential soil lead contamination is higher in the Halo, which by definition is in closer proximity to the mine waste piles. The average soil lead concentration in the Halo was 718 mg/kg lead, which is well above the background soil lead concentration for St. Francois County. Eighty-four percent of these properties are elevated in the mid-yard areas outside of the drip zone. The Lead Speciation Study showed very little evidence that the lead contamination in the mid-yard areas could be attributed to LBP.

While EPA is not addressing residential properties that have only a drip zone exceedance of the Site-specific cleanup level for lead, it should be recognized that the drip zone lead concentration is most likely to be a combination of decades of mine waste deposition along with a contribution from those homes with deteriorating exterior LBP.

Comment 9, Page 11, Subsection 4.

- 4. Even within the "Halo" the data show no correlation between the Blood Lead Levels and the Proximity to piles.***

EPA RESPONSE:

EPA does not agree that there is no correlation between EBLs and the proximity to the identified mine waste source areas. See response to Comment 2.

Comment 10. Page 14, Subsection 5, continuing onto page 16, Paragraph 1:

- 5. Blood Lead Levels in St. Francois County Have Already Been Reduced to Levels Below EPA's Remedial Action Objective.***

The Missouri Department of Health and Senior Service ("MDHSS"), formerly Missouri Department of Health ("MDOH"), has maintained a data set of children, less than six years of age, who have been tested for BLLs since 1997. Note the percent of the population with elevated BLL identified in the Lead Exposure Study and the Interim Action cannot be compared directly to the MDHSS yearly statistics as these studies' statistics range over multiple years and are limited only to the study participants and therefore probably do not completely represent the area's unbiased population. The MDHSS data set is reported by county and may include the same child in multiple years due to possible yearly or biyearly testing. Figure 5 presents the percent of EBL children compared to the cumulative number of complete yard soil removals conducted in the Response Area. As seen in this figure, the decline in St. Francois County's child EBL percentage dropped dramatically prior to majority of the yard soil removals.

Blood lead levels among US children age 1 to 5, the population at the highest risk for lead exposure and effects, have been monitored and reported by the CDC and EPA and have declined steadily since surveillance began in 1976. Early (1976-1980) study reported a geometric mean BLL of 14.9 µg/dL just over 88 percent of this high-risk population had EBLs. Data collected from 1991 to 1994 showed that the geometric mean BLL for children was 2.7 µg/dL, with 4.4 percent of the children having EBL. Children age 1 to 5 whose blood was sampled as part of the 2007-2008 survey had a geometric mean BLL of 1.5 µg/dL, with 0.9 percent of the children having EBLs. The data for St. Francois County presented in Figure 5 are consistent with national averages and the decline in the child BLLs with time. The discontinued use of LBP and leaded gasoline, as well as the decrease of lead in food and toys, are the primary contributing factors to these drops in BLLs. Performance of yard soil removals within the County does not appear to affect the natural downward decrease in the County's BLL for children, which further indicates the EBLs had been caused by sources other than mining waste.

EPA RESPONSE:

The fact that the rate of elevated blood lead levels is declining is one important indicator that the actions being taken to address lead contaminated properties in St. Francois County are having the desired effect.

However, a measured EBL rate of 1 percent in St. Francois County is not consistent with EPA's Remedial Action Objective. A measured EBL rate of 1 percent means that of all children who are tested for blood lead levels in St. Francois County, 1 percent have a blood level of greater than 10 µg/dl. EPA's remedial action objective is based on a soil lead concentration that would result in a probability that no child or similarly exposed child would have greater than a 5 percent chance of having a blood lead level greater than 10 µg/dl based on the IEUBK modeling. The remedial action objective is not related to the total percentage of children with elevated blood lead levels; it is related to the probability that a child would have an elevated blood lead level if that child is exposed to soil lead contamination in residential soil. EPA's remedial action objective does not mean that if less than 5 percent of children in St. Francois County have an elevated blood lead level then the remedial action objective is met, as Doe Run seems to suggest.

It should also be noted that ATSDR's position is that there is no safe lead level in blood.

The action level for lead in residential soil, 400 ppm lead is based on the Site-Specific Blood Lead Study and the Site-Specific Human Health Risk Assessment. The data shows that the action level is exceeded in 84 percent of the properties sampled (drip zones excluded). EPA's remedial action objective is based on a soil lead concentration that would result in a probability that no child or similarly exposed child would have greater than a 5 percent chance of having a blood lead level greater than 10 µg/dl based on the IEUBK modeling and the Site-Specific Blood Lead Study.

Comment 11. Page 16, Section B

B. EPA Failed to Identify, Characterize or Otherwise Consider Building Materials, Including LBP, as a Source of Lead Contamination or EBLs.

Section 104(a)(3)(B) expressly prohibits EPA from using its CERCLA response authorities to address releases from LBP. EPA's own directive states "Lead-based paint can be a significant source of lead exposure and needs to be considered when determining the most appropriate response action. Interior

paint can contribute to elevated indoor dust lead levels. In addition, exterior paint can be a significant source of recontamination of soil.¹² Yet EPA has refused to acknowledge LBP's role as a source of contamination, much less evaluate the extent to which it is a source for contamination. EPA's refusal to do so is particularly arbitrary given the data at the Site that indicates LBP is a major source of contamination and a major cause of EBLs.

EPA RESPONSE:

EPA disagrees with the comment. Doe Run misinterprets the prohibition in CERCLA Section 104(a)(3)(B), 42 U.S.C. § 9603(a)(3)(B), which prohibits response actions to a release from products that are part of the structure of, and result in exposure within residential buildings. CERCLA section 104(a)(3)(B) does not prohibit CERCLA response to releases of LBP in residential yards. The prohibition is for products that are part of the structure of a residence and where the release results in exposure within the residence. EPA acknowledges that LBP may be a significant source of indoor lead contamination at the Site. The Selected Remedy includes a HEPA vacuum loan out program to houses subject to remediation but does not include remediation of indoor lead contamination.

Comment 12. Page 17, Subsection 1 continuing onto Page 18, Figure 6

1. Significant amount of LBP was detected during the Interim Action

As reported in the Removal Action Report for Interim Action (NewFields 2004) and the Focused RI (NewFields 2006), many of the highest soil lead concentrations measured in the Interim Action sampling were in the drip zone.¹³ Specifically, more than 42 percent of the drip zone samples had higher lead concentrations than the corresponding yard soil lead concentrations. Drip zone samples were commonly (39 percent) over 1.5 times the average yard lead concentration, indicating the lead source to the drip zone was potentially different or closer to the drip zone source.

Figure 6 presents a comparison of average lead soil concentrations in residential yards with (≥ 1 mg/cm²) and without (< 1 mg/cm²) lead-based paint made in the Interim Action (NewFields 2004). The comparison shows that drip zone soil lead concentrations are influenced by the presence of LBP. Paint chips were observed in some drip zone samples. Many homes in the area have had exterior painted surfaces covered with vinyl siding, and therefore, may be incorrectly identified in the "houses without lead paint" category and thus the concentrations for this category have a higher uncertainty than the "houses with lead paint."

EPA RESPONSE:

EPA agrees that drip zone lead concentrations are often higher than mid yard soil lead concentrations. This is because drip zone soil lead concentrations are a result of both LBP and airborne mine waste deposition. All airborne mine waste depositions that land on the roof or siding of a structure is concentrated in the drip zone as it is washed off by rain or snow, because of this, drip zones are likely to have higher concentrations than mid-yard soils. The graph included in the comment as Figure 6 on page 18 illustrates that houses without LBP have additional contamination in the drip zone and that the average drip zone concentrations are higher than the average mid yard.

Comment 13. Page 19, Subsection 2 continuing onto Page 20, Paragraph 2:

2. More than 65.5 percent of homes in St. Francois County were constructed prior to 1978 and thus potentially contain LBP.

Available age-of-housing data in the incorporated communities within the Response Area (see Table 1 and 2) indicated the housing within the Site is over 65.5 percent pre-1970's and therefore have a high potential for LBP. 15 The identification of outdoor LBP during the Interim Action and Halo Removals may underestimate its occurrence since many homes have been re-sided with vinyl siding, thus masking, but not eliminating, the presence of outdoor LBP. When EPA surveyed 22 homes for LBP as part of its speciation study, 16 of 22 homes had vinyl siding (73 percent).¹⁶ Of the four yards where paint was surveyed, three detected outdoor LBP (primarily on the house versus other outdoor structures).

With the exceptions of Leadwood and Leadington, the percentage of EBL children correlates better to the percentages of measurable outdoor LBP than to any of the elevated yard soil lead concentrations. It should also be noted that the presence of outdoor LBP is probably an indicator of potential indoor LBP.

EPA RESPONSE:

EPA agrees that lead based paint may contribute to lead contamination in residential yard soils in St. Francois County. EPA has always recognized the potential contribution of lead-based paint to soil and dust lead levels at the Site and the speciation studies performed have indicated the presence of lead-based paint in yard soils and interior dust samples analyzed. This is because the speciation studies were designed to determine whether there were other sources of lead contamination present in residential soils and interior dust that contributed to the elevated lead levels in residential soils. The speciation studies performed at the Site clearly show that mining related wastes were present in both residential soils and interior dust. The speciation study also shows that mining related waste was the predominate source of lead in mid-yard samples (>90 percent Relative Mass) and was detected in significant quantities in drip zone samples and interior dust samples from the Site. The commenter fails to recognize that mid-yard samples at homes where lead-based paint was not present contained elevated lead levels and that very little lead-based paint (<2 percent Relative Mass) was detected in mid-yard samples in general.

Further, the conclusion drawn by the comment that one would expect higher EBLs where there is greater LBP is not supported by the evidence. In Table 2, Leadwood has the highest percentage by far of housing stock built prior to the 1970s (82.8 percent) and the highest percentage of homes with measurable outdoor LBP but the lowest number of EBLs identified during the interim action (5.7 percent of children tested had elevated blood lead levels). With the exception of Leadington, the two highest EBL rates (18.2 percent in Bonne Terre and 10.6 percent in Park Hills) also correspond to the two highest mid-yard sampling (92.0 percent and 90.0 percent, respectively).

It should also be noted that the city of Salem, Missouri was used as a control for the 1997 Exposure Study performed by MDOH for ATSDR. Salem has a similar housing stock but no history of mining. The EBL rate in children from Salem was 3 percent compared to 17 percent from the Site.

Comment 14. Page 20, Subsection 3.

Conceptual model assumes indoor dust derives from mining waste. But the Lead Exposure Study indicates LBP is also a significant source of indoor dust.

EPA RESPONSE:

The EPA believes the Conceptual Site Model in the HHRA is appropriate for this Site. EPA agrees that LBP may be a significant source of indoor lead contamination. Interior dust is being addressed under the Selected Remedy through health education and distribution of HEPA vacuum cleaners to residents. While, EPA acknowledges that LBP is a significant source of indoor lead contamination, mine waste was also a significant source (21 percent on a particle concentration weighting basis). Additionally, the RI states that an estimated 36 percent of the lead contaminated dust found in vacuums in St. Francois County was derived from outdoor soil.

However, The IEUBK Model default soil to dust transfer was considered the most appropriate value for this assessment. The presence of elevated lead in indoor dust was evaluated in the HHRA but there was not enough indoor dust data in the RI to determine a Site specific parameters for dust for use as an IEUBK Model input.

Comment 15. Page 22, Section C.

C. Chat from Mining was Widely Used by Residents in St. Francois County and Other Areas as Fertilizer.

For a number of reasons, granular mine tailings ("chat"), when used as agricultural lime fertilizer, cannot and should not be addressed in EPA's Proposed Plan. Agricultural lime is not regulated under federal or state law with respect to contaminant remediation levels. More importantly, EPA does not have jurisdiction over this product because it is exempted from CERCLA: (1) because chat used as fertilizer is exempted from the definition of "release" under CERCLA; and (2) because the consumer use of chat as fertilizer exempts the product from the definition of "facility" under CERCLA. Because of these factors, EPA does not have the authority to respond to or conduct a remedial action to address releases from chat used as fertilizer.

EPA RESPONSE:

EPA does not agree with this comment that EPA does not have authority under CERCLA to address mine waste in St. Francois County because some mine waste was historically used as agricultural lime.

EPA agrees that the definition in CERCLA Section 101(22) of "release" exempts the "normal application of fertilizer." 42 U.S.C. § 9601(22). However, EPA does not agree that this provision of CERCLA prohibits EPA's authority to address lead contamination in residential yards under the Superfund. The remedial action does not address agricultural areas. The purpose of the remedial action is to address mine waste that has been transported by wind and erosion and manually transported to residential properties. Further EPA does not agree that all lead contaminated mine waste is exempt from regulation.

EPA also agrees that the definition in CERCLA Section 101(9) of "facility" excludes "any consumer product in consumer use." 42 U.S.C. § 9601(9). However, EPA does not agree that all mine waste that has come to be located in residential yards may not be addressed under EPA authority under the Superfund. The definition of "facility" under CERCLA provides in part that a facility includes "any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located..." 42 U.S.C. § 9601(9). The site inspection and site assessment for this Site identified potential sources of mine ore processing waste and established that the hazardous substance, lead, was present in elevated concentrations in samples from mine waste, groundwater, sediments and soil throughout the Site.

Further, Doe Run has known since the late 1980's that EPA considered the releases of mining wastes from the mine waste piles by wind and water erosion to be significant enough to warrant listing the Site on the National Priorities List of the highest priority sites for action in the country. Doe Run was also well aware of the negative health impacts to human health and the environment that result from lead exposure. Even with this knowledge, it was necessary for EPA in 2003 to order Doe Run to end the practice of providing lead contaminated tailings for sale as an agricultural amendment. Doe Run's assertion that because there was no regulation regarding lead contamination levels in the sale of a "product", it is necessarily exempt from Superfund authority, is incorrect.

Comment 16. Page 26, Section D.

D. Naturally Occurring Lead is Abundant throughout St. Francois County

Section 104(a)(3)(A) and 40 CFR § 300.430(b)(1) specifically prohibit EPA from using its CERCLA authorities to respond to a release of naturally occurring substances. Yet, EPA has arbitrarily refused to evaluate the extent to which naturally occurring lead is contributing to the detected contamination. As a result, EPA's proposed remedy requires response action with respect to all lead detected, regardless of its source. This result is inconsistent with CERCLA and the NCP.

EPA RESPONSE:

EPA agrees that CERCLA section 103(a)(3)(A) prohibits response actions to a release of a "naturally occurring substance in its unaltered form". However, EPA disagrees that EPA has failed to evaluate the extent to which naturally occurring lead contributes to lead contamination in residential yards.

The Subsurface Soil Investigation showed that lead levels drop significantly from the surface down to 30 inches below ground surface (bgs) in 98 percent of the samples. This investigation covered the entire response area, which is outlined in Figure 1 of the ROD. Additionally, the background soil lead level used in the RI was 62 mg/kg. The lead levels found in the Response Area were much higher than this level.

EPA acknowledges the possibility of naturally occurring lead ores. EPA has addressed this comment by adding the following language to the ROD, "EPA will not intentionally address naturally occurring lead ores in their undisturbed state as part of this action. Although the Site has been heavily mined in the past, it may be possible to encounter naturally occurring lead ores during residential property excavation. Section 104(a)(3)(A) of CERCLA states that removal or remedial actions shall not be provided in response to a release or threat of release "of a naturally occurring substance in its unaltered form, or altered solely through natural processes or phenomena, from a location where it is naturally

found.” Naturally occurring lead ores could be found at the bedrock interface. Another indicator of the presence of naturally occurring lead ores could be a high density of galena crystals in soils or unusually high concentrations of lead in excavated soils. When these conditions are encountered, they will be documented, excavation will stop, and backfilling will be initiated.”

Comment 17, Page 31, Section E.

E. The EBL Data Shows no Correlation with the Mine Waste Sources or with Lead Detections in Yards.

1. *The arbitrary nature of EPA's assumptions is supported by the Interim Action Report, the RI and the subsurface soil study, all of which show no correlation between BLLs and the piles or yard levels.*

EPA RESPONSE:

EPA disagrees with this comment. See responses to Comments 2 and 5.

Comment 18. Page 38, Section II.

II. EPA's Proposed Cleanup Levels for Subsurface Soils and Their Application to Non-Residential Properties are Unsupported by the Data.

The risks in the HHRA are calculated based on the average soil lead level in a residential yard (consistent with lead risk assessment guidance) (EPA, 2009, see page 4-6). However, the Proposed Plan calls for excavation of any quadrant with a sample above 400 mg/kg even if the yard average (average of all quadrants) is below 400 mg/kg. This remediation strategy is not consistent with how the risk assessment was done, and requires more remediation than needed in order to achieve the Remedial Action Objective (RAO) (stated in the Proposed Plan) to: "Reduce the risk of exposure of young children (children under seven years old) to lead such that an individual child or group of similarly exposed children have no greater than a 5 percent chance of exceeding a blood lead level of 10 ug/dL."

Note that when a cleanup level represents a target average concentration for a property, the remediation should be conducted such that the post-remediation property average will be at or below the cleanup level. If every yard quadrant that exceeds the cleanup level is remediated, this may over-achieve the cleanup level on average. At the soil cleanup level of 400 mg/kg selected in the Proposed Plan, evaluating the need for remediation on the basis of risk (average concentration) rather than on the exceedance of a single sample would likely reduce the number of properties requiring remediation while still achieving the RAO. It will also serve to relieve homeowners of intrusion of unnecessary yard removals.

EPA RESPONSE:

EPA disagrees with this approach because it could potentially underestimate the risk, especially if a child uses one area of the yard more than others, such as play areas. Using yard wide averages could result in a scenario in which the yard wide average would be below 400 ppm lead, even where one quadrant is highly contaminated, for example: assuming four quadrants in which results are; 1200 ppm lead; 50 ppm; 50 ppm; and, 50 ppm; the yard wide average would be 337 ppm. In this example no

removal action would be conducted at the property because 337 ppm is less than 400 ppm. However, this situation would leave an entire quadrant contaminated with lead at the surface at 1200 ppm which is the default value for EPA to take prompt action in residential soils (OSWER 9285.7-50, Superfund Lead-Contaminated Residential Sites Handbook, 2003).

In addition, the sampling process for residential properties uses composite sampling which is an averaging technique. Performing additional averaging of composite results has the potential to mask higher detected concentrations and is not recommended (or can result in the above example being repeated).

Comment 19. Page 38, Section III, Subsection A.

III. The Boundary Area of the Proposed Remedy is not clearly defined and May Arbitrarily Extend Beyond Defined Response Area.

A. The EPA Must Clarify that the Proposed Remedy Pertains only to the Defined Response Area.

EPA RESPONSE:

The Response Area has been clearly defined by the RI/FS, however the definition of "facility" under CERCLA includes those areas where a hazardous substance comes to be located. The Selected Remedy will require additional sampling. At present, the Selected Remedy focuses on the Response Area but may move outside the Response Area based on further investigations.

The Selected Remedy is based on a large data set and provides a reasonable estimate of the extent of the number of contaminated properties that will require cleanup. At large lead mining and processing sites, it is not possible or necessary to sample every property and the site boundaries could grow as a result of future sampling as part of the design and implementation of the remedy. The same criteria will be used to determine the ultimate Site boundary as were used to make the estimate. Any property with mid-yard lead concentrations above the Site-specific cleanup level will be a candidate for action. The frequency of detections above the Site-specific cleanup level in a given area of the county will be used to establish the final boundary. It must be recognized that this material has migrated to residential properties by a combination of wind and water erosion and uncontrolled anthropogenic means.

Comment 20. Page 39, Section B.

B. EPA's Broad Definition of "Residential Properties" is unsupported by the Record.

For the purpose of the this proposed remedy, EPA broadly defines "residential property" as "properties that contain single- and multi-family dwellings, apartment complexes, vacant lots in residential areas, schools, daycare centers, playgrounds, parks and green ways." This definition is overly broad for several reasons. First, by including vacant lots and greenways, EPA is including potentially many more parcels than were included in the cost estimates for the remedial alternatives, thus invalidating the evaluation of those alternatives in light of the nine CERCLA criteria, particularly cost-effectiveness. The costs estimates were based on the number of residences provided by EPA. Additionally, EPA's proposal to apply its cleanup levels to these parcels is unsupported by the record and would be arbitrary and capricious.

The Feasibility Study Report states, "On April 14, 2010, EPA provided an estimate of '7,036 occupied houses total, not counting the houses in Doe Run,' based on the most recent census data for each city in the Response Area." 93 yards were added for the town of Doe Run, resulting in a total of 7,129 yards. By adding an unknown number of undefined "vacant lots" and "green ways" to the remedial action will greatly affect the costs and fundamentally alter and invalidate EPA's evaluation of the remedial alternatives, particularly with regard to the cost-effectiveness of the proposed remedy. The Focused RI defined "residential yards" to be the area within 200 feet of the house on each property. The Proposed Plan offers no such definition for vacant lots or green ways, which can and in fact do, encompass many acres throughout the Response Area and St. Francois County.

EPA RESPONSE:

EPA disagrees with this comment. The cost estimate for the Selected Remedy is based on the EPA Guidance ("A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" OSWER 9355.0-75, 2000) which states that costs are to be developed such that accuracy of the estimates are anticipated to fall within the acceptable range for typical feasibility study evaluations of +50 percent to -30 percent.

It is appropriate to include vacant lots in the definition of residential properties. Vacant lots are potential future residential yard and current play areas. They would not be the highest priority for action but will be addressed in otherwise (or areas zoned) residential areas. Further, vacant lots will not significantly affect the cost of the Selected Remedy.

Comment 21. Page 40, Section C.

C. EPA's Proposed Cleanup Levels for Vacant Lots, Parks and Green Ways is Unsupported by the Record and Contrary to Guidance.

EPA RESPONSE:

EPA disagrees with this comment. The definition of residential properties is in accordance with EPA guidance. Residential properties are defined in the Handbook (OSWER 9285.7-50, Superfund Lead-Contaminated Residential Sites Handbook, 2003) as any area with high accessibility to sensitive populations, and includes properties containing single- and multiple-family dwellings, apartment complexes, vacant lots in residential areas, schools, day-care centers, community centers, playgrounds, parks, green ways, and any other areas where children may be exposed to Site-related contaminated media.

Comment 22. Page 41, Section D.

D. EPA's Application of Residential Cleanup Levels to Non-Residential Properties is Contrary to HUD Guidance.

EPA RESPONSE:

Please see response to comment 18 above. EPA is addressing only residential properties as defined in the Handbook.

Comment 23. Page 42, Section A.

A. EPA misstated Alternative 2 as it was presented in the FS.

In its description of Alternative 2, EPA erroneously states that a visual barrier will only be placed if subgrade soils are greater than 1,200 ppm rather than greater than 400 ppm as stated in the FS. Alternative 2 as set forth in the FS, is consistent with the yard soil removals that have been conducted in St. Francois County since 2000 under the Interim Action and Halo Removals. EPA's Plan states that only 7 percent or 280 yards would require these barriers and the accompanying institutional controls. However, the FS stated that under Alternative 2, up to 94 percent (approximately 3,760 yards), or potentially as few as 12 percent (approximately 480 yards) if barrier placement is based on 6-inch vertical subgrade composites rather than subgrade surface samples, would be required under Alternative 2 (NewFields 2011).

EPA RESPONSE:

Since the development of the FS, EPA has determined that lead concentrations below 1,200 ppm based on a 6 inch depth sample at greater than 12 inches below ground surface is protective. EPA has reflected this decision in the ROD. This is consistent with other mining sites in Region 7. The placement of orange-mesh plastic barrier on properties greater than 400 ppm would not significantly increase the protectiveness of Alternative 2 because it would not limit the concentration at 12 inches bgs. However, EPA has updated the ROD to reflect this comment.

Comment 24, Page 42, Section B.

B. EPA Ignored Aspects of Alternative 3 that do not compare favorable to Alternative 2.

EPA RESPONSE:

EPA believes that Alternative 3 is the most protective. EPA realizes there are negative aspects of all the alternatives and they are described in the ROD. EPA disagrees that the additional 32,700 cubic yards of waste soil will place a burden on the repository sites; each of the repository sites have enough capacity to accommodate the additional waste soil. The additional volume of top soil required for Alternative 3 is not significant in light of the total soil required for the remedy. Further, the additional required haul trips are not significant in light of the number of trips required overall for the remedy. While EPA agrees that the time for removals will increase for those properties that require additional excavation based upon a finding of lead contamination greater than 1,200 ppm at 12 inches, this is predicted to affect only approximately 280 properties and therefore should not increase the overall timeframe of the remediation beyond the goal of 7 years. EPA agrees that mixing could occur. The application of the action level requires consideration of the depths of excavation and other risk management elements. Due to the distribution of lead contamination in the soil profile at the Site, EPA has determined that backfilling of excavated areas to original grade with clean material after reaching a residual soil lead level less than 400 ppm in the upper 12 inches bgs, or a residual concentration of less than 1,200 ppm at a depth greater than 24 inches bgs, combined with other elements of the selected remedy, is protective of human health. These cleanup criteria are based upon a risk-management determination made by EPA in consideration of site-specific conditions at the Site and the experience gained in remediating thousands of properties using this strategy.

Comment 25, Page 43 Section C.

C. EPA Arbitrarily Disregarded ATSDR's recommendation regarding Maintenance of "One-Call" Database for Notification Purposes.

EPA RESPONSE:

The "One Call" Database has been evaluated at other sites and is not considered a viable alternative to cleanup. The nature of the visual barrier is unlike a buried electrical line or underground piping system in that it can cover an entire area of a property at varying depths and past inquiries with "one call" providers have not been successful with this type of problem. The region will seek to work with local agencies to provide records of contamination left in place for future development as informational controls.

Comment 26, Page 44, Section D.

D. EPA's evaluation against the Nine Criteria was flawed.

EPA RESPONSE:

- Alternative 1 would not be protective because it would not achieve the RAO based on the action level.
- Alternative 2 would be less protective than Alternative 3 because lead would remain at unlimited concentrations at 12 inches below ground surface (bgs). Alternative 3 would address lead levels greater than or equal to 1,200 ppm down to 24 inches bgs.
- Regarding contamination below 12 inches bgs, EPA agrees that 7 percent of remaining properties may be an underestimate. EPA based this on the only reliable data that has been collected based on 6 inch intervals; however, EPA has included all previously remediated properties greater than or equal to 1,200 ppm at 12 inches below ground surface in the ROD property counts.
- EPA agrees that Alternative 2 would be protective if there was a guarantee that there was no future disturbance of the overlying soil. Alternative 3 would go one step further to protect the residents even if disturbance occurred. This is explained in further detail in the ROD.

Comment 27, Page 47, Section V.

V. The Proposed Plan has numerous misstatements of facts and key omissions of fact.

EPA RESPONSE:

Subsection 1

1. There appears to be significant overlap between these OUs, and it is unclear how each operable unit relates to the others, or to this Proposed Plan, which is identified as addressing only OU 1. For example, as described in the Proposed Plan, OU-00, OU-1 and OU-3 all address residential properties

and CHUAs. The record is unclear as to how each Operable Unit is distinguished from the other, the extent to which this proposed remedy addresses risks being addressed in other OUs, and the extent to which this proposed remedy addresses residential risks in connection with the other OUs. EPA should clarify its record in its regard.

- EPA has corrected the Operable Unit descriptions in the ROD.

Subsection 2

2. The Proposed Plan states on Page 2 that mine wastes have contaminated soil, sediment, surface water and groundwater. Yet on Page 12, EPA concedes that elevated lead concentrations in groundwater (less than 15 ug/l) occur "sporadically and were limited to four wells and could not be linked to the mining activities at the Site." Any statement about mining waste contaminating groundwater should be removed from the Proposed Plan and any decision document.

- Elevated lead levels were found in shallow groundwater around the Big River Mine Tailings Pile. Additionally, elevated zinc levels in groundwater can be attributed to mine waste. This statement does not affect the Selected Remedy.

Subsection 3

3. The Proposed Plan (page 7) discusses the 1998 Lead Exposure Study conducted by MDOH and the high percentage of children in St. Francois County with elevated blood lead levels (17 percent). However, the plan does not discuss the most recent blood lead levels for the county that were reported in the FS, "Missouri Department of Health and Senior Services (MDHSS) reports that the percent of elevated blood lead in children less than 6 years of age in St. Francois County has dropped from 12 percent reported in the 2000 calendar year to 1 percent in the 2010 calendar year (MDHSS 2003, 2011b)." While we understand EPA's argument that the IEUBK model and the potential for high bioavailability for lead in yard soils predicts the potential for the children in St. Francois County to have elevated blood leads, the statistics for the county demonstrates the county's child EBL levels are dropping either without the benefit of soil yard remediation as proposed by EPA and are likely due to an improved education of lead issues.

- This comment was addressed previously on page 7.

Subsection 4

4. Page 7 of the Plan states, "the Subsurface Soil Report concluded that 93 percent of the elevated lead concentrations were found in the upper 12-inches of soil." This is a misrepresentation of the Subsurface Soil Report which actually concluded that "Seven (7) percent of the yard quadrants after a 1 foot excavation would have confirmation subgrade soil lead concentrations greater than 1,200 ppm." The FS uses this conclusion to assess the potential for an excavation to require further excavation under Alternative 3 (the EPA selected alternative). We find using this statistic as a conclusion regarding percentage of elevated lead concentrations confusing and misleading.

- EPA agrees with the recommended language and has included the language in the ROD.

Subsection 5

5. The Proposed Plan (page 7) states that the 2004 removal action (Halo) is ongoing and then (on page 10) states that 1,000 properties remain to be addressed under the Halo Removal Action. These are the yards sampled under the Interim Action but were not included in the Halo Removal Action as they were beyond the Halo (typically between 500 to 1000 feet from the piles). These 1000 yards appear to be in the 4000 yards that are covered under the Proposed Plan with the exception of this statement. As we (Doe Run) are implementing the Halo Removal Action and we find these statements confusing, we are unclear as to what EPA is trying to relay to the public by these statements.

- EPA agrees with the comments and has updated the ROD accordingly.

Subsection 6

6. Page 8 of the Plan states, "(a)t the end of the Interim Action (March 30, 2004), 1,955 residential yards had been sampled and 563 homeowners had refused sampling. Under the Halo Removal Order, 27 additional yards have been sampled; of these yards 22 were sampling refusals during the Interim Action, two were not within the Halo but were sampled due to the presence of a child with elevated blood-lead levels, and two were childcare facilities." It is unclear where EPA derived the statistics for yards sampled under the Halo Removal Action. The FS states, "At the end of the Interim Action (March 30, 2004), 1,955 yards had been sampled and 563 homeowners had refused sampling, for a 78 percent sampling rate. As of January 31, 2011, 2,057 residential yards and 12 CHUAs had been sampled and 532 property owners had refused yard soil sampling with a final residential yard sampling refusal rate of 21 percent." Using these statistics and noting that 45 yards were sampled as part of the Subsurface Soil Investigation, an additional 69 yards/CHUAs were sampled as part of the Halo Removal Action. Of these 69 yards and CHUAs, 3 were parks, 5 were child care or school playground facilities, 29 were previous residential yard refusals (all but one located within the Halo), 17 were non-Halo residential yards sampled due to the presence of a child with elevated blood-lead levels, and the remaining 15 yards were primarily new construction within the Halo.

- EPA agrees with this comment and has updated the ROD accordingly.

Subsection 7

7. The Plan makes the statement "The communities of Farmington, Bismarck and Iron Mountain Lake are outside of the mining area but will be included in future investigations." It is unclear what the purpose of this sentence is and its relation to the Site. As stated above, the FS, including cost estimates, were based on the Response Area only. These communities lie outside the Response Area. If EPA contemplates including them or other locations outside the Response Area, it will render the cost estimates inaccurate, as well as EPA's evaluation of the cost-effectiveness of the proposed remedy.

- This comment was addressed previously on Page 21.

Subsection 8

8. This Plan is confusing as to what would make a residence qualify for inclusion in the remedy. The Plan states on pages 14 and 16 that "Residential properties where no quadrant samples exceed 400 ppm lead would not be addressed under this alternative [2-3]". And then later in Alternative 2 on page 14

states, "Excavation of a residential property would be triggered when the highest recorded soil sample for any defined area of the property contains greater than or equal 400 ppm lead." Alternative 3 does not include this statement. However the cost tables included in the Proposed Plan are from the FS and they show driveway only, garden only, and play area only yards in both alternative costs.

- EPA agrees with this comment and has updated the ROD accordingly.

Subsection 9

9. The Plan states "The physical barrier will function as a warning that digging deeper will result in exposure to soils contaminated with lead at a level that EPA has determined to be a human health concern." The concentration for which a visual barrier is placed under the Proposed Plan is 1,200 ppm. However, in the HHRA summary and discussion the plan states on page 12 that "a lead soil concentration of 400 ppm to ensure that a child has less than a 5 percent probability of having a blood-lead level exceeding 10 ug/dL." And the only mention of the 1,200 ppm in the HHRA is in the statement "In past experience at Superfund sites where lead is the contaminant of concern, the EPA generally selects a residential soil cleanup level within the range of 400 ppm to 1,200 ppm for lead..." The RAO section of the Proposed Plan (pages 12-13) makes it clear that exposures above 400 ppm lead under the assumed exposure conditions would create an unacceptable risk for a child. We believe EPA needs to clearly state its rationale for the acceptance of soil lead concentrations between 400 and 1200 ppm lead at depth; as mentioned above we do not necessarily agree with EPA's interpretation of the ATSDR document especially in regard to the lack of institutional controls under these conditions.

- EPA agrees with this comment and has updated the ROD accordingly.

ATTACHMENT A

Ecology and Environment, Inc.

PHOTOGRAPHIC RECORD



SITE NAME: Big River Mine Tailings

SITE LOCATION: Osage, Missouri

TLD/PAGE: P-07-9204-011/PNO0616A

No: 3
Subject:

Tailings migrating via wind erosion. Proximity of site to Big River on east side of site.

Photographer:
Overfelt

Witness:
Gene Gunn

Date/Time:
January 1983

Direction:
Northwest

No: 4
Subject:

Dune features migrating west to east in east central meander area.

Photographer:
Overfelt

Witness:
Williams

Date/Time:
7/28/80
1540 hours

Direction:
North

