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MEMORANDUM

To Jim Christiansen
cc Jeff Montera (CDM)
From Bill Brattin
Date 4/23/02

RE Comments on Draft SAP for Libby OU 4

Jim

As you requested, I have reviewed the draft Sampling and Analysis Plan for Libby Operable Unit 4 I focused my attention mainly on those area regarding the overall design and logic of the plan and did not seek to focus on management sections and detailed QA issues that Mary and you are much more qualified to speak to than me My comments are provided below

General Comments

1 I found no clear presentation of the overall goals and objectives of the study Bits and pieces exist in Section 1 1 and 3 1, but the big picture is very hard to grasp The normal location for such a discussion is in the first section of the DQO text However, granted that the DQOs are not presented until Section 5, I recommend that Section 1 1 be substantially expanded to include a thorough discussion of the purpose of the investigation, and the tactical issue involved Key points to cover include the following

- Previous investigations have revealed that there are multiple potential sources of asbestos in the residential and commercial areas of Libby

- These sources may release fibers to air if disturbed, and airborne levels can reach a level of public health concern Therefore, it is necessary to remove the sources in order to protect public health

- Quantitative rules for identifying <u>all</u> sources of potential concern are not yet developed, and will depend on improvements in analytical methods and in risk assessment procedures

- However, some sources (those of greatest concern) can be identified now Thus, the purpose of the CSS is to identify the most obvious and visible potential sources of asbestos in the residential and commercial areas of Libby, so that they may be addressed by appropriate removal or remedial actions

- Because of the size of the site and the number of properties that need to be evaluated emphasis is placed on an approach that minimizes sampling and analysis to identify areas requiring remediation This includes visual or verbal indication of the presence of ZAI in a home, visual observation of soil or waste piles that contain vermiculite in the yard, and detection of asbestos in soil by infrared spectroscopy at a concentration above 0 1%

- KEY POINT Properties that do not meet any of these triggers for action will not undergo any remediation at this time, but these properties might require further investigation and/or remediation as final risk assessment and remedial decisions are made

Although the organization may be a little strained, I think it would be pretty helpful in this same introductory section to present a schematic flow chart/decision tree to diagram the CSS This would show what information (verbal, visual) is to collected at each property, the rules for deciding if and when samples of media are to be collected, and the rules for deciding what needs to be remediated Then, the entire rest of the document would be the detailed explanation for this diagram (why each step was taken, and how the data will be collected and utilized)

2 I found the text to be pretty sparse when it comes to a discussion of <u>WHY</u> certain approaches and methods are used It is as if the decisions are all made and this document is just a cook book for what will be done However, a key component of this document is a discussion of why certain methods and approaches were selected in preference to other alternatives, and how we know that the approach and methods selected will be adequate to support risk management decisions This applies throughout the entire SAP

Specific Comments

1 Page 1-1, paragraph 5 It is not correct to say that the major concern of LAA is the content of tremolite As the USGS has clearly established, Libby amphibole is a mixture of different mineral types, and EPA has made an active decision not to try to distinguish between them Tremolite is actually a relatively small fraction of the total LAA

2 Page 1-1, paragraph 5 A minor semantic point, but referring to the investigation as the "contaminant screening study" (CSS) implies that there are multiple "contaminants" you will be screening for, and calling the material "LAA" implies that you are measuring asbestos rather than vermiculite Perhaps some other nomenclature might be more appropriate All of our TEM analytical sheets classify fibers as Libby amphibole (LA) rather than Libby amphibole asbestos (LAA), and there is some debate as to how many of those fibers are actually asbestos and how many are cleavage fragments

3 Page 2-3, Section 2 4 As noted above, do not indicate that Libby asbestos is restricted to tremolite Also, delete the statement that "Tremolite asbestos is considered by many to be the most toxic " First, I do not think this is true If it is true, it certainly needs a citation

3 Page 2-3, Section 2 4 Risks from inhalation exposure include lung cancer as well as mesothelioma and asbestosis Somewhere in the document (here seems as good as any) the text should distinguish between effects that are associated with inhalation exposure and those that are associated with ingestion exposure The text should then explain whether this study is focused on inhalation exposure (I assume it is) rather than ingestion exposure, and why If ingestion exposure is an intended focus, there are an entirely new set of questions that must be addressed

4 Page 3-1, Section 3 1 It is very important NOT to classify a property as "clean" just because no obvious primary or secondary source is identified during the study In a worst case scenario the risk assessment might support the conclusion that 0 001% or less in soil might be a problem This is 2 orders of magnitude or more below the limits of the present study

4 Page 3-1, Section 3 1 Bullet 4 indicates that some properties will be classified as having no primary source but "is contaminated with secondary sources" First, a clear definition is needed for "primary source" and "secondary source" There is text on page 1-2 that is sort of relevant, but I find it to be pretty vague and insufficient to tell exactly what is meant by each phrase Second, how does a property become "contaminated with a secondary source" (does this mean

that a secondary medium is contaminated?) when there is no "primary source"? See also my later comments regarding dust sampling

5 Page 3-2, Section 3 3 1 I suppose the study can prioritize sampling in any way that makes sense, but why should businesses receive higher priority than homes? Aren't residents just as entitled to "become familiar with their situation regarding LAA contamination"

6 Page 3-2, Section 3 3 1 1 The text indicates that locations where soil has been previously collected and tested by PLM will not be sampled if the data satisfy DQOs presented in Section 5 This needs clarification Which DQOs? Remember that PLM has a detection limit of about 1% while the detection limit of IR and SEM is stated to be about 0 1% Thus, a non-detect by PLM will never be adequate Why not just say this straight out? A PLM hit (a detect above 1%) will trigger action, and a negative PLM will be considered insufficient However, what about a PLM result that is "< 1%" (i e , trace)? Will this be considered a hit that does not require IR/SEM follow up, or will this have to be re-tested?

Page 3-5, Visual Confirmation of ZAI I assume it is not too hard to tell ZAI when you see it, but it seems that the plan should include a set of photographs of the material and that a list of visual characteristic or attributes of ZAI and some sort of training procedure should be in place to ensure that field teams can make this confirmation correctly Otherwise, W R Grace may claim that the identification was arbitrary and was likely to be incorrect in some cases

Page 3-6, "Visual Inspection" See comment above I think recognizing vermiculite in soil may be tougher than in insulation How will the crews be able to do this? What training or guidelines are established?

Also, I recommend that soil samples SHOULD be collected from such locations First, in terms of cost, analyzing such samples will increase the workload only a little (unless you think that nearly all locations will contain visible vermiculite) Even if you do not want to analyze them, collect them and hold them in case the need arises to analyze them in the future

Page 3-7, Section 3 3 3 3 I find this confusing The text says that dust samples will NOT be collected as part of the CSS, but that dust samples WILL be collected at specific properties If the latter is true, the former is not true Also, how will the field team decide when to collect dust? What are the indicators that would trigger this?

I thought the idea was that if the home was now or previously occupied by a worker at the mine or that a current or former resident had been diagnosed with asbestos-related lung disease, this would be the trigger for sampling of indoor dust If so, these triggers should be clearly stated If not, the logic and triggers for dust sampling should be clearly established Otherwise, how will the potential need for dust sampling be recognized?

Page 3-7, Section 3 3 4 The text indicates samples will be analyzed by IR and "depending on sample results, a split sample may be submitted for analysis by SEM" What are the rules for deciding when to submit a sample for SEM? What is the purpose of this step? Do you intend to follow this step for dust as well as soil? If so, have you checked to see how much material is needed for IR? Will you have enough dust sample to do that? How will the two sets of results be compared? What if they disagree?

Page 3-8, Section 3 4 A point of semantics, but the QC program does not ensure the data "are of sound quality" (whatever that means) The QC program collects data so that the quality of the data (good or bad) can be assessed

Also, the list of steps does not include the use of any PE samples Maybe you view this as a "non-field" step, but inclusion of PE samples in the sample train is not a "laboratory QA" step either If you will be using PE samples to assess accuracy, I think they should be mentioned here If not when you discuss accuracy under PARCC, you will have a problem describing if the analyses are accurate or not LCSs are not a great alternative

Page 5-8, Section 5 4 1 1 First, the text states that both inhalation and ingestion pathways are to be evaluated I doubt that this is true, but if it is, it raises a whole new set of questions and problems that are not addressed in the plan

More importantly, the text here is NOT a statement of the problem Rather, it is a sort of rambling summary of the project This section (State the Problem) would normally be the place where the big picture is painted, and the data gaps that are limiting progress are identified In this regard, there are two types of data gaps 1) absence of reliable information on the level and extent of asbestos contamination of environmental media (sources), and 2) absence of the final rule for knowing when remediation is needed and when it is not This is where the text needs to emphasize that current methods (both analytical and risk assessment) are not ready to make the final call, but that a some decisions can still be made now (a worst first type approach) The problem the plan seeks to address is that the locations of homes and yards with "primary" sources

are not known for all properties, and this study is intended to address that problem It is also important to stress the problems posed by the scale of the operation there are so many homes and residences and the cost of routine analysis is so high that a presumptive approach that minimizes the need for costly and slow analytical work is needed

As a minor point, the final paragraph under section 5 4 1 1 is redundant and entirely out of place A list of team members is unrelated to the question "What is the problem"

Page 5-2, Section 5 4 1 2 This text does not identify the decision to be made The text says "the decision statement is whether or not the presence or absence of potential LAA sources is known for each property" This is makes no sense (at least to me) We already know what we know and what we do not know The real decision to be made is whether or not, at a particular property, there is a need to take remedial action under the "worst first" principles of the study The long list of "Outcome/Cleanup decision" alternatives belongs under the "Decision Rule" section, not here

Page 5-11, Section 5 4 1 5 This section is the place where the decision rules must be articulated The minimum revision is to move the long list from Section 5 4 1 2 to here As noted earlier, I think a flowchart would be very helpful

However, other changes are probably needed The second and third paragraphs of the current section lists the inputs to the decision, not the decision, and are not relevant to the topic

The fourth paragraph states "Because there is no action level for the study, the detection limits were set a[t] values below an action level previously used at the Libby Asbestos site (1 percent) " The action levels are really the heart of the whole matter, and the text does not capture or explain the relevant issues First the <u>detection levels</u> are not set at some arbitrary value lower than previous studies The detection levels are whatever the method yields Second, there <u>are</u> action levels for the program the action levels are a) visible or verbal evidence of ZAI in a residence b) visible vermiculite in outdoor soils or waste piles, and c) asbestos levels above a level of detection by IR (0 1%) and/or by SEM In all cases, the text needs to explain why these action levels are judged to be appropriate for identifying sources that definitely need remediation If you cannot establish a clear logic for treating these sources as being clearly above a level of concern, then you have no logical basis for taking action at those locations This can be done fairly easily I think by cross-referencing and summarizing Chris's risk memos

Also, I find a few of the decision rules confusing For example, if ZAI is found, the response is "clean up ZAI and indoor sources" What "indoor sources"? Dust? If so, why not just say so? Dust may or may not be a current source of asbestos, depending on whether there has or has not been any significant past release from the ZAI The point (I assume) is that it is easier, faster, cheaper, and safer to just clean up the dust than to measure the asbestos concentration in the dust to determine if it is a "source" or not

Page 5-11, Section 5 4 1 6 This section really misses the boat, I think The decision rule is to take remedial action whenever there is ZAI in a house, visible vermiculite present in any outdoor area, or asbestos in soil at a level higher than the detection limit (nominally 0 1%) The question is, how much error can be tolerated in classifying a property into one of these bins? What if the detection limit of IR in soil ranges from 0 05% to 2% from sample to sample? Would that be ok? What if the sampling plan for soil had a 50% chance of missing an area of size "x" that was above 0 1%? What if the plan for identifying a house with ZAI missed half of the houses, or flagged a lot of houses where there really was no ZAI? Would that be ok?

Then, having specified the acceptable error rates, the normal goal is to describe how the plan will make sure the error rate is not higher than the limits In a more typical case, this would take the form of a power calculation so the number of samples collected will limit the Type I and the Type II error rates In this case, I think you will need to provide a more qualitative discussion as to why you think the plan for identifying ZAI will have a low error rate (either false positive or false negative), and the same for the soil sampling design Why 5-point composites? Why stratified by land use? How many per property or per unit area? Why do you think this will not miss sources that need clean-up If you repeated the soil test taking samples from a different set of locations what are the odds you would get the same results? etc, etc, etc,

As a final point, the text that says " the null hypothesis is that the presence or absence of LAA at each property in the study area is known The alternative hypothesis is that the presence or absence is not known " As discussed above, this is not a useful formulation of the "null hypothesis" Null hypotheses are usually statements that are tested statistically Since it is not likely that you will be using any statistical tests in the program, it is not clear there is a "null hypothesis" If there is, it is that any property that a) has ZAI identified verbally or visually, b) has vermiculite visible in soil, or c) has an IR signal greater than the detection limit, are contaminated with asbestos at a level sufficiently high to warrant remedial action However, you never perform any tests of the null hypothesis

Page 5-13, Accuracy

The text states that accuracy will be assessed using LCSs What LCSs will be used? What concentrations? Of what? Also, if LCS are (apparently) available to the labs, why would we not get some of the same stuff (or some stuff of our own) and submit some samples blind in the field sampling train LCS do bear on accuracy, but true assessment of accuracy requires the samples be submitted blind in the field sample train Otherwise, errors in sample preparation or differences in level of effort are possible

Another key point to address is whether or not IR can reliably distinguish massive amphibole from fibrous (asbestiform) amphibole I am a little foggy on this, but I thought he answer was no If that is the case, then you need a detailed discussion of the Type II error problem this might cause (declaring a soil to require remediation when it really does not) This discussion could both here and in the DQO section