805 0
File: 541.460.000n
C.H.

THE MEMPHIS DEPOT
TENNESSEE

ADMINISTRATIVE RECORD
COVER SHEET

AR File Number 805

NOTE: These minutes were approved at the October 16, 2003 RAB meeting.

File: C.H. 190.300.000a

805 1

AR# 805

MEETING MINUTES

Restoration Advisory Board
February 20, 2003
1620 Marjorie Street
South Memphis Senior Citizen's Center
Memphis, Tennessee

The Restoration Advisory Board (RAB) meeting was held at 6:00 p.m. on February 20, 2003 at the South Memphis Senior Citizen's Center, located at 1620 Marjorie Street, Memphis, Tennessee.

The attendance list is attached.

WELCOME AND INTRODUCTION

MR. DEBACK: I want to welcome you to the RAB meeting. Can everybody hear me? Okay, I want to welcome everybody tonight to the RAB meeting. It has been awhile since I have chaired one of the meetings, and I'm glad to be back. I want to just take a second and recognize some guests we have in from out of town from my headquarters. Mike Dobbs from the Defense Distribution Center.

MR. DOBBS: How y'all doing?

MR. DEBACK: Jeanne Masters from the Defense Logistics Agency and Mary Horvath from the Defense Logistics Agency. We have a new representative that's sitting in for Turpin tonight, Ann Godfrey from EPA (Environmental Protection Agency) Region IV, the Federal Facilities Division, and we have Tiki Whitfield-Booker here also from EPA.

We at the Depot would like to send our condolences to Mr. Bond for the loss of his wife, Betty, last month, and also to Ms. Peters -- there she is. I'm sorry for the loss of her friend. You know, when you go into these types of meetings and meet people -- and Mr. Anderson is somebody that I met early on at these RAB meetings. Before I became the chair here, he and I sat quite a few moments, you know, aside from the meeting just talking about a lot of

things. He was a very interesting fellow, and I'm very sorry to hear about his passing.

MS. PETERS: Thank you.

REVIEW AND APPROVE FEBRUARY AGENDA

MR. DEBACK: With that, we need to review and approve the February agenda. Have you all had a chance to look at the agenda?

MR. TRUITT: I so move. Ulysses Truitt. I'm sorry.

MR. DEBACK: Do we have a second?

MR. BRAYON: Second, Brayon.

MR. DEBACK: Okay, we approve the agenda.

REVIEW AND APPROVE JUNE AND OCTOBER MEETING MINUTES

MR. DEBACK: And next we'll move on with review and approval of the June and October 2002 meeting minutes. Let's do this in order. The June meeting minutes, do we have a motion to approve the June meeting minutes?

MS. PETERS: Johnnie Mae Peters. Mr. Chairman, I move that we accept the June meeting minutes.

MR. TRUITT: Second.

MR. DEBACK: It has been moved to approve the June meeting minutes. And for the October meeting minutes?

MR. BRAYON: I move that the October meeting minutes be approved.

MR. DEBACK: Okay, second?

MR. TRUITT: Second.

MR. DEBACK: Thank you. All in favor? I'm sorry. It's been too long. Can we have a vote on the approval of the meeting minutes for both months? All in favor?

THE BOARD: Aye.

MR. DEBACK: Any opposed? (Brief pause.)

MR. DEBACK: The minutes are approved.

OLD BUSINESS

MR. DEBACK: Our co-chair isn't here tonight. Is there anybody on the RAB that has any Old Business issues that we need to discuss? (Brief pause.)

UPDATES -- COMPLETION OF THE FIVE-YEAR REVIEW, ENHANCED BIOREMEDIATION AND DUNN FIELD LEAD REMOVAL PROJECT

MR. DEBACK: Okay, we'll move into the update. We have just recently completed our Five-Year Review. A copy has been sent on CD ROM to each RAB member, and it's also available in the repositories.

Our enhanced bioremediation pilot test on the Main Installation has started. The first round -- we had an unusual rain event after we did the injection. So the tests have come back inconclusive. We are extending that pilot for six months. We're going to re-inject the media and continue the pilot test. That's the current status. For those of you that don't recall, we're injecting sodium leachate in the area where the police precinct is, adjacent to the golf course. It's vegetable oil mulch, and it's being injected down in that area where the old paint shop was at the southwest corner of the Main Installation. We will not be re-injecting that soil. Because of the way that technology works, it takes a little bit longer to see the results on that, and our preliminary tests show that the media that we put into the ground down there is still there.

The Dunn Field lead removal project -- this has been one of my pet peeves because it's such a simple project, but it seems like it's taking so long to get going. We have removed the contaminated soil. It has been taken away. The tests have come back. I wanted to be able to tell you that the project is complete tonight, but what we've got left to do is a little bit of grading and

seeding of the soil up there. For the most part, that project is complete, and that will allow that parcel to be declared, "No further action." Any questions about that?

MS. PETERS: Johnnie Mae Peters. When you will have finished moving all of the dirt that is necessary, would that make the ground be all right and not contaminated at all?

MR. DEBACK: In that particular area, yes, ma'am, and all of that dirt has been taken out. That was a soil removal. It's a fairly simple cleanup operation. It was the backstop where the pistol range was, and we went in and took out the lead contaminated soil. We took it away. On some of those they sift the soil and take the lead out and put the soil back. We didn't do that. We took the soil away.

MR. TYLER: Stanley Tyler. After you remove the soil and clean up, what standard will it be? Industrial? Residential? Commercial?

MR. DEBACK: This particular cleanup is on the residential side.

MR. TYLER: And how far does it extend around the pistol range? About 50 meters, 60 meters, how many feet?

MR. DEBACK: Well, we went where we didn't have anything else. You know, we did the testing. We took out the first cut of soil, and then we tested, and right directly behind the backstop, as you would expect, there was residue still left. So we did another cut in there, and it's all cleaned out.

MR. TYLER: So, from where they started shooting the pistols where the guys stand and shoot pistols, my house -- my mother's house is approximately 75 yards from there. I can look from her yard and look over there, and I can see the earth moved in there.

MR. DEBACK: Yes, sir.

MR. TYLER: And you're going to leave the mound itself; correct?

MR. DEBACK: We're going to contour that where the cuts are made for that reason, and then we will seed that.

MR. TYLER: Thank you.

MR. DEBACK: Any other questions? (Brief pause.)

NEW BUSINESS - DUNN FIELD FEASIBILITY STUDY

MR. DEBACK: Okay, with that, we'll move into the presentation of the Dunn Field Feasibility Study (FS). I apologize to the RAB that we were unable to get this study into your hands before this briefing. We've had some technical problems, and I still don't have the CD-ROMs tonight, but as soon as we receive those from our contractor, we will be sending them.

This Feasibility Study is the basis for the Proposed Plan, and we will be having a public meeting on the Proposed Plan in April. So, all of the alternatives will be reflected in the Feasibility Study, but the Preferred Alternative will not be cited as part of the process of the Proposed Plan. And with that, I'll turn the briefing over to Mr. Steve Offner who, as most of you know, is our contractor with CH2M Hill.

MR. OFFNER: All right, they're making me wear this today. I'm going to blast everybody out of the building. It's good to see everybody again. Just like Mr. DeBack said, I'm going to give a status on the Dunn Field Feasibility Study. This represents Revision 1 of the Feasibility Study. Revision 0, which is the initial draft, was reviewed by the regulators, and the comments have been incorporated into Rev. 1. You should be receiving Rev. 1 mid to late next week.

You're going to get this report in time. We're going to brief it here. Most of the things that you see here you will see again during the Public Comment Period when we go through the Proposed Plan. But you'll see the information now, and you're going to have about two months to be able to review this information and get up to speed as to when you see the Proposed Plan and what the Preferred Alternative at that time would be.

Again, this is the Feasibility Study stage for Dunn Field. I just wanted to give a quick review -- where it sits in the whole process. The Remedial Investigation was completed last summer. We briefed the RAB in February and April of 2002, and this is the next step beyond that. These are the findings from the Remedial Investigation (RI), and it screens it, and we'll talk about exactly what it does.

But the next step out of this is the Proposed Plan, which has a Public Comment Period, which will be the April/May time frame of this year. And then the next step is the Record of Decision, which will be this summer, and we have a slide to the status of that.

MR. OFFNER: This is a summary presentation. Again, we're going to go through what the Feasibility Study is. We have some slides you have seen before as part of the RI presentations, and we'll go through some of those because they're integral to leading up through the Feasibility Study and the Remedial Alternatives that are presented.

We're going to talk about the Remedial Technologies, how they are identified and screened and how they are married up with the Remedial Action Objectives for Dunn Field and how the two are related. Once you come out of identifying the screening Remedial Technologies, you go into your Remedial Alternatives, and we're going to talk about the pre-design investigation for the Remedial Alternatives, the detailed analysis that leads to the alternatives per media and how they are evaluated per the criteria-- the nine EPA criteria.

And then we'll end with the next steps for Dunn Field. We've talked a little bit about the schedule already, but the near term schedule through the Record of Decision.

Dunn Field Feasibility Study -- We did a Feasibility Study for the Main Installation. I don't know if you remember that, and actually, for that one we did two Feasibility Studies. One was soil; one was groundwater. This is the same process. It presents a range for Remedial Alternatives to address the environmental conditions on Dunn Field. The environmental conditions were documented in the Remedial Investigation or the RI. Again, that was completed in July of 2002. And we briefed that both from a nature and extent, you know -- how much, where was the contamination. And then in April we talked about the risks that were presented from that.

MR. OFFNER: The FS also evaluates the expected performance of each alternative against the cleanup criteria. There are nine of them established by EPA.
The FS gives us a decision making tool to go forward to identify the most effective Remedial Alternative. When we say "Remedial Alternative," it's usually a combination of Remedial Alternatives but under the heading of what is it going to take to get it cleaned up. It's a regulatory process required by law. It's CERCLA. (Comprehensive Environmental Response, Compensation and Liability Act) That's the law that drives this. It's a document that is reviewed by the federal and state regulators and obviously EPA, and for us here it is the Tennessee Department of Environment and Conservation, also known as TDEC.

You have seen some of these slides before, but in the Remedial Investigation we looked at four areas on Dunn Field -- the Northeast Open Area, which is the pistol range. We see that up in here (Indicating). The Disposal Area, which is pretty much the northwest side of Dunn Field, and then the Stockpile Area, which is the southern portion of Dunn Field. The fourth area is the groundwater beneath Dunn Field, and this is a figure from a previous presentation used in the RI. And the four of these make up the 70 areas, all the sampling that went in during the Remedial Investigation. They come out and find out what the risks were.

If you remember back, this slide is familiar. (Indicating) It gives us basically conclusions from the Risk Assessment from the Remedial Investigation and all the sampling that was done on those four study areas. And these conclusions are based on the area and looking at the land use scenarios. This particular table was broken out by the risk -- "Was it safe? Yes or no?" And then the "no's" in this particular table, if you remember back, these are the things that carry us forward into the Remedial Action. (Indicating)

So, I do want to point out here that for the Northeast Open Area we have all yeses across there, and at the time, the exception was the lead levels at the former pistol range, and those are gone now. The soil removal is in progress and near completion. There's some site restoration left.

MR. OFFNER: The reason you saw "no" on some of these tables were because we had constituents of concern. We also call them COCs. They're the substances identified in the Risk Assessment that require Remedial Action -- cleanup criteria.

In the Northeast Open Area we have lead in the surface soil. In the Disposal Area we had a number of chlorinated volatile organic compounds. You'll hear us refer to those as CVOCs, and then we had polycyclic aromatic hydrocarbons, antimony and arsenic.

Then in the Stockpile Area we had some arsenic in the surface soil. However, these arsenic concentrations were within the background levels that we saw during the background study that was conducted during the Remedial Investigation.

For groundwater I'm going to say the shallow aquifer. Remember back during some of the RI groundwater presentations we had the shallow fluvial

aquifer beneath Dunn Field, below that an intermediate aquifer, and then we have the Memphis Aquifer in the Memphis Sand formation.
In the shallow aquifer we have some CVOCs. Those are the primary COCs that require remedial action. And groundwater from the shallow aquifer or fluvial aquifer under Dunn Field is not used for drinking or any other residential uses.

MR. OFFNER: Now, that's the information that was brought in through the Remedial Investigation. All that information comes in now, and we start looking at identifying Remedial Technologies or processes that we can use to clean up the site. So we start zapping up our alternatives, our technologies that ultimately will build up to our cleanup alternatives. One of the first things we have to do is develop the Applicable or Relevant and Appropriate Requirements, and that's a mouth full, but that is something in the CERCLA world that we call ARARs. You may hear that term. Basically, those are the federal and state standards to which any Remedial Actions must meet. They are chemical specific.

There are three types of ARARs. There are chemical specific ARARs, action specific ARARs and location specific ARARs, and we gave some examples of each one of those. Chemical specific would be like our drinking water standards for groundwater. An action specific would be an action such as Remedial Action, and the environmental laws that would require gas or vapor treatment. And then there are location specific ARARs that we have in Memphis and Shelby County that prohibit water wells within a half mile radius of a CERCLA site. So, those are the kinds of environmental regulations that any Remedial Action that we look at has to comply with.

The second thing is to establish Remedial Action Objectives. These are called RAOs. These are the goals the remedial actions must meet to protect

the human health and the environment, and they are many times based on the intended future use of the property.

For Dunn Field, the surface soil, a lot of these things are based on media or media specific for the RAOs. Surface soil in the Northeast Open Area was lead. The Remedial Action Objective there was the removal of surface soil containing lead on the former pistol range.

MR. OFFNER: In the Disposal Area we're looking at the land use controls, excavation or containment to prevent exposure to the constituents of concern of that location. The subsurface soil below -- down to the water table, which is 78 feet on Dunn Field, our Remedial Action Objectives are to prevent exposure of the COCs detected in this top and feeder soil and to prevent subsurface disturbance of buried waste at Dunn Field by workers.

Other areas are the disposal sites, and we have two RAOs there. The first one is to eliminate the potential of groundwater impacts to the buried materials at these sites, and the second one is to eliminate future unacceptable risks of exposure through intrusive activities at any of these sites.

The next one is the soil-to-indoor air for Dunn Field. And that is to prevent direct inhalation of VOCs, volatile organic compounds, in indoor air vapors from affected subsurface soil. I just wanted to add a note that there are no structures on Dunn Field where that receptor is actually occurring, but that is something we need to plan for.

And then the last one is groundwater, and the three Remedial Objectives there are to prevent the use of the shallow groundwater for drinking, prevent further offsite migration of the volatile organic compounds in the shallow

aquifer and to remediate the shallow aquifer to be protective of the deeper Memphis Aquifer, which is a source of drinking water.

Based on the ARARs, you remember those are the laws that govern us on environmental work and Remedial Action Objectives, we were able to screen out the various Remedial Technologies that are out there, and there are quite a few. But you start making your primary and your secondary role through these various technologies of processes. Some cleanup options are identified as inappropriate. They can't treat the particular compound we have in the soil or groundwater or for other reasons they can't be in the ARARs or can't meet the Remedial Action Objective. Those are screened out during this process.

MR. OFFNER: Remedial options retained after the preliminary screen are then looked at a little differently. They're looked at and then compared for effectiveness, technical efficiency and cost. And then the technology and process options retained after this screening are looked at in common categories: within treatment, within containment, within those types of technologies; which one would be better, which one would work better, and these are done to identify the preferred options for remediation.

Now, the CERCLA process gives guidance of what they want to see. The guidance wants to see a range of alternatives that should include a no-action alternative. They want to see a no-action so they can always compare with what would happen if you did nothing compared to a more active remedy. They want to see one or more alternatives that involve the containment with little or no treatment. If you kept it there, what will that do? And then they want to see a range of alternatives to address the potential risks and eliminate or minimize the need for long-term management. Those are basically treatment type alternatives.

What we have gone through is the basic screening process that happens in the Feasibility Study, and you'll be able to go through and read the document. Next after you screen the alternatives, you come out with a handful of remedial options. You look at all the technologies and processes, and you come out with a short list, to kind of characterize it, of technologies that will work -- Remedial Alternatives.

As part of that, there are a couple of pre-design investigations that are planned to help better identify the Remedial Alternatives -- better defined Remedial Alternatives. The first one is a pre-design investigation that will be conducted at 16 of the disposal sites on the west side of Dunn Field. This is to confirm the contents of the disposal sites in support of the short list of Remedial Alternatives.

MR. OFFNER: A work plan is going to be prepared for review by EPA and TDEC, and the pre-design investigation is scheduled for late spring, early summer. The Depot community will be informed prior to those activities, and results from the pre-design investigation will also be presented to the RAB in the future. What we're going to do is go back out here and use the best science available and look at these sites to hone in on remedial alternatives that are available to us for the disposal sites.

There is a figure here (Indicating), and we have some on the wall over here, too. But if you look here on the screen, it will show you the areas along the western side of Dunn Field. There will be 16 sites. Some of these sites are co-located in some of them, but if you look here, you can see where we are talking about in the very northwest corner. And there is one site on the southwest corner.

There is a second pre-design investigation that is also planned. We're going to be doing some bench-scale and pilot tests of zero valent iron (ZVI). That

is a chemical reducing agent for the CVOCs in groundwater. Again, we're going to be doing work plans for these events and the regulators will review them.

MR. OFFNER: The first one is a bench-scale lab treatability test. We're going to be looking at two of those. What we'll be doing is collecting soil and site groundwater and sending it to a lab where over a period of time various admixtures of zero valent iron are added. And it is determined what reducing effect, basically called reductive dechlorination, happens on the chemicals treated to a point where they are protective. Based on those bench-scale treatability tests, which will be planned for the spring of 2003, we're going to take the findings from those, and the engineering and design elements in those, and we're going to design a field pilot test for use of zero valent iron as a chemical reducing agent on Dunn Field. And the Depot community will be informed prior to field activities and will be informed of the results as they come in. The pre-design investigations are tools we can use to better determine the preferred remedy for Dunn Field.

Now, we've talked about coming through the technology screening, and now we're in the Remedial Alternatives. We've talked about a couple of things we want to do to better help us here, but right now the alternatives that have been retained for the various media that we talked about are as indicated here. One, we talked about the no-action alternative. CERCLA makes us carry that forward. Two is the soil containment and the institutional controls. Three is an ex-situ treatment. Basically, materials are dug up and then treated on site. And four is excavation, transportation and offsite disposal. That's basically the list of alternatives that come through the screening process for the disposal sites and the associated subsurface soils that are around and beneath these disposal sites.

The detailed analysis of the alternatives continues. The alternative that has been retained for subsurface soils and also takes care of the soil-to-air risk is only one alternative: Soil vapor extraction. I don't know if you remember back last year when we gave a presentation about conducting a pilot test in late 2001, 2002 for soil vapor extraction on Dunn Field. The findings from that pilot test supported the presumptive remedy that EPA had already established for this remedial technology. This is basically the Preferred Remedial Technology for remediating the soil with volatile organic compounds. So, this particular presumptive remedy is being carried forward as the best alternative for those contaminants in the soil.

MR. OFFNER: For groundwater the alternatives that have been retained in the shallow aquifer – there are four of them. One is the no-action alternative. The second one is -- and these are some hybrids of technologies tested as they have gone down through the screening process, but alternative two is the use of zero valent iron. Remember, we were going to do some pilot tests of that material to see how that actually works, very much like we did the SVE when we pilot tested that to see how that would work for the SVE pilot for the subsurface soils.

So, we're looking at zero valent iron for source areas in the groundwater. Alternative two includes enhanced bioremediation, like Mr. DeBack was saying on the Main Installation, enhancing the existing groundwater extraction system, and then using natural attenuation and institutional controls as part of the Remedial Alternative. This alternative number two includes the injection of zero valent iron down into the groundwater, into the aquifer, the shallow aquifer, to reduce the COCs by chemical reduction. Again, enhanced bioremediation for offsite down gradient groundwater plumes, and it also includes the expanding of existing extraction systems. Natural attenuation and institutional controls prohibiting use of the shallow aquifer are also included.

Alternative three uses ZVI injection. This one also includes the installation of a permeable reactive barrier (PRB), which uses granular iron the same way, but it is a barrier wall, you might think of it, that is constructed down gradient where the groundwater passes through and is then treated by the oxidized iron. It basically chemically reduces the volatile organic compounds. ZVI for the source areas, monitored natural attenuation and institutional controls for this alternative are as seen in alternative two.

Alternative four for groundwater includes an air sparging. And for this site it would include the SVE (soil vapor extraction) system that we are already looking at as a preferred presumptive remedy for the soils. It also includes the constructing of a permeable reactive barrier and natural attenuation and institutional controls.

Air sparging combines a method that reduces the volatile organic compounds in water through the injection of air. It sparges. The air comes out and sparges the contamination, volatizes it up, and those vapors are then extracted through the soil vapor extraction system. It includes a permeable reactive barrier that is down gradient. It catches the down gradient portion of the plume and includes nature attenuation and institutional controls, similar to two and three.

MS. ARNST: This is Diane Arnst. Are those volatilized? Are the VOCs captured in (unintelligible)?

MR. OFFNER: Yes, they are, and that's part of the process -- to find the ARARs for this site. Both through the SVE system -- and the SVE system captures the vapor from the air sparging system -- will be brought to the land surface and then treated through a number of different technologies that will be evaluated, including carbon -- there is a number of different types of technologies. But, yes, to answer your question.

If you look at the list of the alternatives, the Feasibility Study takes these alternatives and evaluates them against the nine criteria that have been set forth by EPA. These alternatives basically are broken into three primary evaluating criteria. The first one is a threshold criterion. I would like to say, this one that we have to meet of the threshold criteria. It's required. And that is the overall protection of human health and the environment has to be accomplished by that remedial alternative and has to comply with the ARARs that are set for the site.

MR. OFFNER: Once you can accomplish those two things, then you go into what we call the evaluating criteria, and there are five of those. And those are basically balancing criteria that let you know that it's going to protect the health and the environment and it is in compliance with ARARs. You go through what is the long-term effectiveness and performance, the reduction of toxicity, mobility or volume through treatment, short-term effectiveness, the implementability and cost of the remedial action. All of these criteria tend to balance out and give you the ability to kind of grade or evaluate the alternatives both against the criteria and against each other.

And then there is the third set, which is the modifying criteria, and it's number eight and nine of the nine criteria. This is state acceptance and community acceptance. These modifying criteria are evaluated after the Proposed Plan and the Record of Decision stage and the Responsiveness Summary. I don't know if you remember that from the Record of Decision for the Main Installation.

Now, the next steps at Dunn Field -- The winter or spring of this year we are completing the Dunn Field FS. When we say that, that means Rev. 2. -- Rev. 2 means final. You're getting Rev. 1 next week. It has another short review cycle that the regulators will be reviewing as well and then any revisions are made at that point. And Revision 2 will be prepared -- the final document.

Also during the winter and spring we are completing the Dunn Field Proposed Plan and the Public Comment Period for the Proposed Plan is in April and May. You're going to see much of this presentation again because during the presentation at the Public Comment Period we'll walk through the alternatives again and then give reasons why there has been a preferred alternative chosen and the reasons behind that.

In the summer of 2003 the Record of Decision for Dunn Field will be prepared. Again, Revision 1 will be submitted to the RAB members for their early involvement.

MS. ARNST: This is Diane Arnst again. On your reductive chlorination initial test, will that be done before the April 16th meeting?

MR. OFFNER: What we're doing -- ZVI is a use of iron as a reductive media. It's pretty well known. Ms. Arnst, we're probably going to run these concurrently, and then as we move toward Dunn Field, if there's something that indicates that ZVI is chosen to be the preferred alternative, some combination there, and the pilot test for the bench-scale test weren't real responsive, we would probably have to adjust and look at it in contingency of the next alternative to go to. But the bench-scale test will probably be occurring during the March and April time frame.

MR. BRAYON: Brayon. Just one -- a couple of questions on the COCs, you know, the tetrachloroethenes and the carbon tests and so forth?

MR. OFFNER: Yes, sir.

MR. BRAYON: Did you ever determine a source? Or where are these things coming from?

MR. OFFNER: They are coming from the soils. The soils are acting as a source for those COCs in groundwater. Now, the source of the CVOCs in the soil, many of them we have been able to characterize through the Remedial Investigation -- find out the limits of where they are present. Most of them are in the Disposal Area, the northwest corner. Now, we're also going to be looking at some of these disposal sites. We'll be doing some pre-investigation to see if some of them are acting as the primary source for some of these compounds.

But for now we do know where the primary source from a whole is on those compounds. We'll know what sites we have to go in and get out and then the rest of the soil is treated through the use of soil vapor extraction. That is a very applicable technology for reducing the tetrachloroethene, the 1,1,2,2 tetrachloroethane, carbon tetrachloride and chloroform.

MR. BRAYON: These seem to be, you know, quite similar to cleaning solutions.

MR. OFFNER: Yes, sir.

MR. BRAYON: Are these coming -- you know, at one time there was some talk about something off the premises.

MR. OFFNER: Yes.

MR. BRAYON: Is this confined?

MR. OFFNER: We do have an area to the northeast of Dunn Field where we do have some compounds that have come down that have an upgradiant position, hydraulically upgradiant. Water flows from areas of high head to low head. This area is an area of high head. There is a source up there. So we are seeing some volatile organic compounds that have migrated from that direction onto Dunn Field and then west of Dunn Field. We are dealing with some of those. We're working with TDEC to get some wells looked at, and then we have some areas lined up that are a source for other VOCs as well.

MR. BRAYON: But until we find the source and the origin, and if it's as you say, then this will be a constant thing?

MR. OFFNER: Well, for Dunn Field we know where we have to go. So we know the Remedial Action Objectives we have for Dunn Field. The offsite source, we're trying to work and see how we can stop the source there. As a contingency item we're looking at is possibly having to look up in that northeast corner to maybe set up some type of permeable reactive barrier to catch these coming on field. That's a contingency right now, to see how we can work out where and who the potential source is, and how they can be treated up in that northeast area.

MR. BRAYON: Until you do this, I would be rather skeptical about the designated recreation as "yes" for this area or for these areas. You know, under the Risk

Assessment conclusions you have "Northeast Open Area for recreation safe—"yes".

MR. OFFNER: Yes.

MR. BRAYON: "Disposal Area, not applicable, and Stockpile Area, yes."

MR. OFFNER: Okay, yes, you have got to look at the cumulative effects, the concentrations of contaminants coming on site, don't pose a problem for recreational use at the surface of the land. It's the drinking water. The receptor there -- the risk is access to the groundwater and drinking it at that location. The other locations on Dunn Field, and then west of Dunn Field we know what the risks are and we know what the Remedial Action Objectives are to make it protective.

MR. TYLER: Stanley Tyler. I have several questions. The first one I want to ask is -- We had Ms. Connie Hess come out with the TAPP (Technical Assistance and Public Participation) grant money. And go over a lot of these documents, and she brought up a point about fissures opening in the clay aquifer. Do you know how many there are and do they go out to the deep aquifer? Because I have never seen a chart or graph of how many fissures we have on Dunn Field.

MR. OFFNER: We call those opening in the basal clay into the fluvial aquifer, and we've identified three areas. And those are areas that we have taken into account as part of our Remedial Action Objectives. We have to be protective of those areas because those are potential routes to the deeper aquifers. Yes, we know we're not drinking the fluvial aquifer water, but three aquifers down we are. So, the Remedial Action Objectives do take that into account, and we do know where they are.

MR. TYLER: Why do they never show them on the chart here?

MR. OFFNER: Well, okay, we have given a groundwater presentation, and they were shown there, and they are in the RI, and they are going to be in the FS you'll look at next week. They are identified as "windows in the clay." We have contoured the clay in that area. If you look on -- well, I will show you up here. I think I've got a slide here. I don't know if you can see this, but here

on MW40 is one of those areas, down here near MW43 and down here on the Main Installation (Indicating). Those are areas that we're looking at and already needs to be protective of those areas.

MR. COVINGTON: Show it again.

MR. OFFNER: Show them again? We're looking at areas that are up in here near MW40, MW43 and down here near MW34. I do want to add the same note that in Dunn Field the clay that forms the aquitard to the fluvial aquifer, in the area, say, MW37 what we saw at MW67, what we see down here at MW36 it's 60 to 70 feet thick. So, we have a good confining unit for Dunn Field. These other areas we speak of, that's part of the Remedial Action Objectives.

MR. TYLER: Okay, you said 60 to 70 feet thick. That extends the length and breadth of Dunn Field?

MR. OFFNER: It extends -- yes. Where you see that footprint or that outline, yes.

MR. TYLER: Okay, now, when you sink your wells, you are protecting the openings you are making as you go down into the aquifer; correct?

MR. OFFNER: Yes, sir.

MR. TYLER: Okay, now, my next question: How deep have you been sinking for these experiments you're doing? How deep are you going to go?

MR. OFFNER: Okay, right now we're looking at treating the fluvial aquifer. The fluvial aquifer on Dunn Field is found at about -- 77, 78 feet. The top of the water and the top of that clay is about 90 feet. We have about a 15-foot saturated thickness on Dunn Field that we need to treat in the fluvial aquifer. Now, that's the area that we're focusing for treatment.

MR. TYLER: A few more questions. Now, this technology you have to remediate Dunn Field, has this been tried before or are there any notes on this? Do you guys have some of this on your Web site that I can download some of these new technologies that you are going to use on Dunn Field?

MR. OFFNER: Good point. We're going to be presenting some fact sheets. There are some EPA fact sheets on permeable reactive barriers and the use of granular iron as an oxidizing agent -- I'm sorry -- as a reducing agent. It causes reductive dechlorination of the compounds. Yes, that is a known technology. So, I

can get the information. I was talking with Alma about getting some fact sheets that are available on that and making them available. And the Feasibility Study will also have that information in there, too.

MR. TYLER: Well, like, where have they been used before?

MR. OFFNER: Okay, I can get that information.

MR. TYLER: Is it on your Web site that I can just download it myself?

MR. OFFNER: I don't know. I can give you some links to a number of vendors that do this material. A lot of the iron work, the granular iron work, is done through the University of Waterloo. They're the experts at using the oxidizing of iron to treat chlorinated -- they have a great Web site. They have some great papers. I'm involved in another project where they solved a trench. The water table was more toward the surface of the land, and we were able to install using track hoe equipment and then put the trench in and using iron there. It's getting quite popular, actually. So I can get that information to you.

MR. TYLER: This is quite a bit of information to download into your mainframe, and sometimes you need a little bit of time to -- for those who are not scientifically, you know, astute.

MR. OFFNER: That's fine. Anything for the next two-month period we can help you -- information, fact sheets, things like that, while you're going through the Feasibility Study for the next couple of months before the Proposed Plan meeting.

MR. TYLER: And my last question -- sorry everyone -- why will there be no public hearing on this Dunn Field remediation? I notice you have a Public Comment Period, but no one has said anything about a public hearing.

MR. OFFNER: There is a public meeting scheduled for I believe late April when we're going to go through the presentation and comments can start then. It's during the Public Comment Period, the 30-day Public Comment Period and we are going to have a public meeting for that. It's not just going to be a RAB. It's going to be a public meeting.

MR. MORRISON: Jim Morrison, Superfund. Stanley, a Web site that you can go to find out these two technologies is, I think, ITRC.org. I believe that they would have

all the different types of technologies and maybe some primers on just exactly where they're coming from, and that may suffice for some quick references.

MR. TYLER: Would you repeat that again?

MR. MORRISON: That would be ITRC.org. They've also got training available on their -- you can have Internet training on these.

MR. OFFNER: I can take action here with Alma to get some Web sites that are good. EPA has some good ones. And there's another remediation round table, which is a consortium of all the agencies and EPA and the state agencies. That's offered as a matrix format of looking at Remedial Technologies, how they work and what they work against or for. Any other questions? (Brief pause.)

MR. OFFNER: Thank you.

MR. DEBACK: Let's move on. The next item on the agenda will be the -- we had a BCT meeting, not today, but we had one last month, and Jim Morrison will give a brief update of that meeting.

MR. MORRISON: Jim Morrison, TDEC. Well, essentially, it's going to be brief because everything that we discussed in the January meeting in Atlanta at CH2M Hill has actually been presented at this RAB. The issues that we talked about were the CERCLA Five-Year Review for the Dunn Field Interim Action. John has covered that.

The enhanced bioremediation treatment study update -- John also talked about that, and Steve did, too. The one thing that we have not talked about that John brought up that's going to facilitate some of the transfers on the Main Installation is they're trying to define the plume boundaries on the Main Installation as to which ones can be coded a different category for transfer.

Stanley, one of these items that were discussed there were the locations of long-term monitoring wells on the Main Installation that would be protective also of the Memphis Sand Aquifer. That's the one thing that we do want to

make certain. that as we go through this time period for investigating the groundwater and when we're determining what is going to be the best Remedial Alternative selected out there, we want to make certain that the Memphis Sand is protected out here. So, we are looking at different locations on the Main Installation and Dunn Field to make certain we have everything captured. You can never have 100 percent certainty, but we're going to try to strive for very high percentages of protectiveness of the Memphis Sand Aquifer from the contaminants at the Depot.

Let's see, on Dunn Field we also talked about the schedule of deliveries that are coming up through the ROD, which is the evidence which Steve presented tonight, which was a very good presentation, moving into the Proposed Plan, which is going to be coming in, I believe he said, late April, and then the Record of Decision.

MR. MORRISON: We also talked about the disposal sites that Steve outlined here on Dunn Field, the ZVI, which is the Zero Valent Iron Treatability Study, that Steve just went over. Again, zero valent iron, it's a way -- these chlorinated solvents, to deal with them right now. What we're finding is we've got to go through the process of reductive dechlorinations. That's how we reduce the chlorinated solvents into their daughter components, which will soon remediate on their own.

And then we also looked at, as Steve touched on a little bit, the offsite access for monitoring wells. Most of you have all seen this contaminant plume extends up to the northeast of Dunn Field. We are currently looking at putting wells offsite and just figure out is this contamination truly related to Dunn Field activities in the past or is this contamination that we're seeing from the northeast coming from an offsite source. Indications are currently; from what data that we have out here, via wells, that groundwater is flowing

onto Dunn Field. And this contamination that we're seeing at the upper most northeast portion of Dunn Field maybe offsite related.

We also had an update on the industrial waste water discharge for the Dunn Field Interim Action, and, as John went over, the pistol range lead that's coming to an end soon -- next week, and that's what was discussed at the January 16th meeting.

MR. DEBACK: Thank you, Jim. Mr. Tyler.

MR. TYLER: When is the next BCT meeting? Because sometimes we were informed. You know, I try to make those if I have prior notification.

MR. DEBACK: We generally have the BCT meetings every month, and the next BCT meeting is scheduled for the third Thursday -- third Wednesday or Thursday. I'll have to get with you on that.

MR. TYLER: You can fax it to me.

MR. DEBACK: We had the meeting. The reason we didn't have the meeting this month is non-availability of one of the members and preparation for this presentation.

MS. MOORE: The RAB meeting was announced.

MR. TYLER: I remember very well. I had a personal problem. One question, Mr. Morrison. You said something about this offsite contamination of contaminants. When you said "offsite," you're talking it had to be located like to a certain area or certain geographic location in the northwest corner or is it just the whole corner -- the corner you're talking about?

MR. DEBACK: Steve?

MR. OFFNER: I'm sorry?

MR. DEBACK: Could you talk to the question of the offsite number eight?

MR. MORRISON: Would you put the map you had up just a minute ago with the plume outline on it? Stanley, you notice the arrows on -- you have the black arrows, and they all represent groundwater flow directions. And one thing that you will see is that they all have different directions to them. But if you look up to the northeast, you will see this arrow is coming down towards Dunn Field, right

up through here (Indicating). This is what we're calling a potential offsite source for the groundwater on Dunn Field.

We know that Dunn Field did not really have activities that extended up in here (Indicating). I wish I had a pointer now. We've had detects offsite of contaminants that we're finding down in here at Monitoring Well 51 there and also PZ02, up there (Indicating). We've had historical detects of contamination that we're seeing down in here (Indicating).
It looks like -- when you see this kind of plume map or this overview of this contamination, you think everything is related. However, plumes don't -- if you had a release at this location down here with groundwater flowing in that direction, to the west, the contamination that we're seeing up here, it is not possible that the contamination is released here because related to that contamination is offsite. So, that's what we're talking about on the offsite contamination. Does that answer your question?

MR. TYLER: Yes. Mr. Brayon brought up an interesting point, that if you would only try to contain that contamination, this would be an ongoing process until the year 2050. You know, because you say you're going to stop it there. I mean, it's going to go around and move somewhere else.

MR. DEBACK: All right, I don't think that he meant to contain the contamination. The alternative that he was discussing was another permeable reactive barrier that would treat that contamination as it came onto Dunn Field.

MR. MORRISON: That's correct.

MR. DEBACK: Any other questions?

MR. COVINGTON: Jim Covington. How deep would that barrier be, some 60 feet maybe?

MR. OFFNER: Yes. In the FS we discussed about implementations and ability of some of these alternatives. This particular barrier would have to be installed by an injection, borings wells or perhaps vertically cracking, injecting material to form a wall. It's too deep for a long stick excavator or something like that. When we're talking about the implementability here, it's somewhat difficult,

but they are doing it, and they're doing it successfully, even at depths deeper than what we have to do.

MR. COVINGTON: What's it made of?

MR. OFFNER: It would deliver an iron material in a guar gum or some other natural material that carries the material out into the formation and then naturally dissipates and leaves a barrier of reactive iron. And as the groundwater passes through it with the chlorinated volatiles we talked about, it's treated. Now, our tests will show the resonance time, what's needed, how thick the wall has to be to make the treatment work -- it's all part of the design -- or if that would be the chosen remedy of the preferred remedy, but these reductions have been quite fast.

MR. COVINGTON: And the life of the material?

MR. OFFNER: It is now, they're thinking, a couple of decades. They're seeing now that the ones that were done in the early 1990s are still very viable and working. And they're saying that the iron fill can last up to another couple of decades.

MR. DEBACK: Any other questions? (Brief pause.)

MR. DEBACK: If there are no further questions, I would like to make an announcement. It's really with much chagrin that I'm making this announcement, and that is that Clyde Hunt, who has been, literally, my right hand for a few years now, is going to be leaving us at the end of the month. He is going back to the Memphis Corps District, and I am not very happy about that. But I don't have a lot of choice.

I know that we will all miss him. I think Alma has got some other words and a message from our headquarters on that. I had planned my prepared script, if you will, intending to tell you about all of Clyde's accomplishments, and most of you have already heard them several times with different introductions. So I'm not going to bore you with that, but I will tell you that he has been a tremendous aid to me, to this RAB and to the community. And I just wanted to express my appreciation for Clyde's assistance to the RAB. Alma.

MS. MOORE: Clyde is going back to the federal building with the Corp of Engineers in Memphis. And I'm used to him being here to assist me with the technical jargon. I could just run to his office and ask a question. So I'm going to truly miss him. On behalf of DLA, Mike Dobbs and the Defense Distribution Center. Clyde, "This is a certificate of appreciation presented to Mr. Clyde Hunt. Mr. Clyde Hunt is hereby recognized for his significant contribution as the on-site engineer for the former Memphis, Tennessee Depot Environmental Restoration Program. As an enthusiastic partner in this effort, Mr. Hunt displayed the willingness and resoluteness required to ensure safety and efficiency of the restoration activities while supporting the community interest. Mr. Hunt's commitment and support to the Memphis community was relentless. The time spent working with the community to listen and answer their concerns contributed greatly to the improved relationship between the agency and the community. Furthermore, Mr. Hunt was able to successfully collaborate with federal, state and local regulators and leaders, facilitating the forward progress of the program. In summary, Mr. Hunt has distinguished himself through a spirit of cooperation, innovation and a desire for excellence to achieve a clean, safe environment. Given on this the 20th day of February, 2003." And it's signed by Kathleen M. Gain, Brigadier General Commander for DDC.

We also have a plaque for Clyde. "Clyde Hunt, in recognition of outstanding service from March 2001 to March 2003 from DLA."
And Mike Dobbs also has a coin for you -- a nice coin with your name on it. "Mr. Hunt, for support to the Defense Distribution Center." It has his name on it, and we have a cake, and we invite everyone to share. The cake says, "The Memphis Depot Community will miss you, Clyde," and I surely will miss you.

MR. DEBACK: I would just like to let everybody know that this commander's coin is kind of a unique award that's presented within DLA and it's not given out very frequently. Mr. Tyler.

MR. TYLER: On behalf of the RAB members, it's been a pleasure working with you, Mr. Hunt. Though I may have strained a nerve or two, it was always about business. And I will truly miss you because you have an open-door policy, an open-telephone policy, and you've put up with me relentlessly, and I thank you for your kindness, and your hard work and your professionalism. Good luck.

MR. HUNT: Thank you very much, Mr. Tyler, and thanks, John, for your continued support, and Mike Dobbs, and Frontline and to Alma for your support during the time I have been here at the Depot. But I really want to take this opportunity to commend the Restoration Advisory Board for your commitment to the community and to the people who you serve. Your accomplishments and influence have made a significant impact upon the cleanup decisions and community outreach implemented at the site. You have raised awareness of your concerns and we have responded to your concerns to assure that they were addressed.

We have worked with our contractors and our regulators to reach the ultimate goal, and that is the protection of the environment with effective remediation projects in the overall cleanup of the Depot property.
Once again, I commend the RAB for your continued presence and efforts on this Board as we approach the Record of Decision for Dunn Field. The ROD will be a major milestone that will occur later this year. And the Record of Decision will define the selected remedy for Dunn Field. You should feel proud knowing that your input into the CERCLA process has helped or will help reach this milestone. As the RAB approaches the end of your mission, know that I sincerely appreciate -- my thanks to you for allowing me the opportunity to be a part of the great work of restoring, reusing and revitalizing the Memphis Depot Business Park. Thank you again, and God bless each of you on your journey.

MS. PETERS: Ms. Peters. I really hate to see you go because I had so much confidence in everything that you told me with all the questions and everything that I asked

you. You always gave me real good answers, and I trusted you. I know wherever you go you are going to do well; but we will miss you.

MR. HUNT: Thank you very much, Ms. Peters.

MR. DEBACK: I'm sure the RAB will agree that you are welcome to stop back any time, Clyde.

Before we go into the RAB Comment Period, I would just like to remind the RAB that the revision of the Feasibility Study that you're receiving is a draft revision. So, this is part of our commitment to give you advance notification of these documents as they are prepared. I encourage you to research this document and any questions that you might have to bring those questions to us, either through Alma or you can call my office. I will do my best to see that we respond to your questions and concerns as you go through this document. Of course, you will still have the opportunity through the Proposed Plan from the Public Comment Period on the ROD to put in other concerns that you may have. Any other questions? (Brief pause.)

RAB COMMENT PERIOD

MR. DEBACK: With that, are there any RAB comments?
(Brief pause.)

PUBLIC COMMENT PERIOD

MR. DEBACK: Do we have any comments from the public? If you have a comment, please step to the microphone over here. (Brief pause.)

MR. DEBACK: If you have no further comments, I would ask for a motion to adjourn.

MR. BRAYON: I motion that we adjourn.

MR. TRUITT: Second.

MR. DEBACK: It's been motioned and seconded that we adjourn. Thank you for your attendance.

(Whereupon, the meeting was adjourned at approximately 7:15 p.m.)

NEXT RAB MEETING THURSDAY

June 19, 2003

6:00 P.M.

Attendance List

Restoration Advisory Board Members

Mr. John DeBack	Facility Co-Chair
Mr. Clyde Hunt	Remedial Program Manager
Mr. Dave Bond	Citizen Representative
Mr. Jim Morrison	Tennessee Department of Environment and Conservation
Mr. Reginald Eskridge	Citizen Representative
Mr. Ulysses Truitt	Citizen Representative
Ms. Johnnie Mae Peters	Citizen Representative
Mr. Eugene Brayon	Citizen Representative
Mr. Stanley Tyler	Citizen Representative
Mr. Jim Covington	Depot Redevelopment Corporation (DRC)
Ms. Peggy Brooks	Citizen Representative
Ms. Diane Arnst	Memphis/Shelby County Health Department
Ms. Betty Mills	Citizen Representative
Ms. Janet Hooks	Memphis City Council
Mr. Torrence Myers	Memphis Light, Gas & Water

Others in Attendance

Mr. Bruce Railey	USACE, Huntsville
Ms. Kim Bridges	Citizen
Mr. Benjamin Moore	Agency for Toxic Substances and Disease Registry
Ms. Mary Horvath	Defense Logistics Agency

Ms. Jeanne Masters	Defense Logistics Agency
Mr. Michael Dobbs	Defense Distribution Center
Ms. Annie Godfrey	Environmental Protection Agency
Ms. Tiki Whitfield	Environmental Protection Agency
Ms. Alma Black Moore	Frontline Communications
Mr. Trevor S. Diggins	Frontline Communications
Mr. Steve Offner	CH2M Hill

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE