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THE MEMPHIS DEPOT
TENNESSEE

ADMINISTRATIVE RECORD
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AR # 807

Final

Memphis Depot

BRAC Cleanup Team

Meeting Minutes

September 20 - 21, 2004

BRAC Cleanup Team	Organization	Phone/email
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Turpin Ballard	Environmental Protection Agency, Region IV (EPA)	404.562.8553
James Morrison	Tennessee Department of Environment and Conservation, Division of Superfund (TDEC)	615.532.0910
Project Team	**Organization**	**Phone**
David Buxbaum	U.S. Army SREO	404.524.5061 x.287
Tom Holmes	MACTEC Engineering	770.421.3373
Denise Cooper	MACTEC Engineering	901.767.1249
Bruce Railey	Corps of Engineers – Huntsville	256.895.1463
David Nelson	CH2M Hill	770.604.9182 x645
Kinzie Gordon	Mitretek Systems	303.779.2664
John K. Miller	Mitretek Systems	703.610.2560

Previous Meeting Minute Approval

The BCT provided additional comments, then approved and signed the minutes from the August 25 – 26, 2004 meeting.

Early Implementation at Dunn Field Technical Memorandum (TM)

The team discussed comments to the draft Early Implementation TM distributed by CH2M Hill. Ms. Gordon and Mr. Ballard commented on the ARAR information indicating that the ROD covered the ARARs and that the TM info was confusing. Mr. Buxbaum provided document revisions to Mr. Nelson paring down the subject language to reflect the NCP requirements and to address their comments.

Ms. Gordon questioned the statement regarding a window to the Memphis aquifer at MW40. Mr. Nelson responded that U.S. Geological Survey hydrograph measurements indicated a connection between the intermediate aquifer and the Memphis aquifer. Ms. Gordon and Mr. Holmes opined that the statement was specific to MW40 where the nature of the connection had not been investigated and suggested toning the statement down. Mr. Ballard indicated the TM needed to establish the hydrologic connection between the fluvial aquifer and the Memphis aquifer through

the intermediate aquifer and to establish that contamination in the fluvial aquifer could move into intermediate aquifer.

Ms. Gordon commented that the distance from Dunn Field to the Allen Well Field should be confirmed, as the TM stated it was ½ mile, and she thought it was about 1 mile. The team raised the need to identify whether the distance referred to the actual wells or to a zone of influence. She also indicated that the language should reflect that the injection points along MW144 (Area 2) did not have the same urgency as along the leading edge of the plume. Mr. Ballard interjected that Area 1 was the primary area for early action, and that if additional monitoring wells or injection points were needed there, then they could be pulled from Area 2.

Mr. Miller asked if Mr. Nelson was designing to a radius of influence (ROI) of 25 or 40 feet? Mr. Morrison suggested deleting the ROI of 40 feet on the figures and within the text. Mr. Nelson indicated that the ZVI treatability study (TS) showed an ROI of 40, so he wanted to include that in the TM. Mr. Miller suggested the language reflect that CH2M Hill would design to 25 feet and note that the TS indicated an ROI of 40 feet at other locations.

Mr. Nelson said that the ZVI subcontractor, ARS, based the mass of iron injected on a ratio of pounds of contaminants to pounds of iron as well as pounds of soil to pounds of iron. Mr. Nelson used a ratio 0.5 % within an injection area of 25 feet. Mr. Holmes interjected that review of the TS indicated an iron to soil ratio of 0.3% was used; therefore, a ratio of 0.5% in the early implementation would be conservative.

Mr. Nelson stated that the team designed the injection mass with an 18-foot average aquifer thickness in Area 1. ARS injected up to the capillary fringe of the aquifer. The amount of iron will be different in each injection boring depending upon the aquifer thickness. Mr. Holmes added that the team will survey all the injection locations and measure water levels before injecting so the ZVI contractor will have a good fix on how high in the aquifer they need to inject. Mr. Ballard brought up Mr. Morrison's comment from last month about contamination stratification within the saturated thickness and said that it would be nice to know if there was stratification because the contractor might not have to inject the full thickness of the aquifer.

Monitoring Well DQOs

The team discussed the data quality objectives (DQOs) for the monitoring wells included in the early implementation task. Mr. Holmes described how the DQOs considered stratification. Mr. Ballard clarified that he was not necessarily talking about inter-fingering, but that there could be a 5- or 6-foot thickness at the top of the aquifer that could be clean and that there would be cost consideration, if the contractor did not have to inject into the vadose zone. He continued that if the plume had been there a long time, contamination should have stabilized. Mr. Morrison interjected that if sampling to determine contaminant stratification optimizes the injections then he has no problem with additional sampling. He said that past experiences in the area indicate that contamination tends to find a zone and move through it. Past experience also indicates that without identifying if and where stratification occurred, the area was not effectively treated.

Mr. Holmes indicated he was looking at the historic O&M diffusion bag sampling data and that he did not see a lot of stratification. Mr. Ballard remarked that diffusion bag sampling for the areas of greater saturated thickness would identify the density gradient or preferential pathway in order to target the treatment. Mr. Holmes pointed out the schedule indicated the need to decide

quickly to conduct diffusion bag sampling of all the wells in the treatment. Mr. Morrison approved of the approach.

Mr. Holmes voiced concern that the diffusion bags would have to remain in place during the upcoming ZVI injections and that the injections would affect the results. Mr. Morrison suggested placing bags in the first well, so that these bags would equilibrate by completion of the last well. Mr. Ballard agreed that unless allowed to fully equilibrate, the bag samples would not provide the data needed. It was estimated that a week would probably be sufficient time for the diffusion bags to equilibrate. Mr. Ballard also said that significant stratification in MW158 might be an indicator to gain economies if the top of the saturated zone was clean.

AI: Collect low flow samples from the new wells and place diffusion bags in MW158 A and B. Consider collecting additional samples in MW155 and MW54.

Additional TM Discussion

Ms. Gordon suggested changing the heading of Section 4 to "Basis for Decision," as no regulatory determination was made. Mr. Ballard suggested moving Section 4 in front of Section 3. Mr. Buxbaum suggested changing Section 3A to "Summary of ZVI Remedy," as the basis for ZVI was outlined in the ROD. Mr. Morrison and Mr. Ballard suggested changing "of the >500ug/L" to "within the 500 ug/L contour."

Ms. Gordon suggested acknowledging that the areas slated for the early implementation action were not proposed in the Dunn Field ROD in order to link the action to the ROD. The document indicates that the early implementation action does not represent a significant change to the ROD, but it does not clarify what the change is. Mr. Ballard provided suggestions to further clarify the non-significant changes and to document the necessity for early implementation. Mr. Nelson captured these and other changes within the document.

The team agreed to revise the figures to distribute specific injection points so that the 25-foot ROI meets the 500 ug/L contour in places, and to show the injection points on a figure with the 500 ug/L and 100 ug/L contours.

The team discussed the process for finalizing the Early Implementation Technical Memorandum. Mr. Ballard suggested the TM include a cover letter from Mr. Dobbs with concurrence letters from TDEC and EPA. Mr. Ballard and Mr. Morrison will send memos to Mr. Dobbs concurring with the approach presented in the TM and based on the discussions during the July, August and September BCT meeting. Mr. Nelson will make the revisions and distribute the TM. Mr. Dobbs will submit the TM, cover letter and concurrence letters to the file for incorporation into the administrative record.

ZVI Treatability Study and further discussion of the Early Implementation Action

Mr. Nelson provided information from the Treatability Study being completed by CH2M Hill. Results indicated that ZVI was found at multiple depths 17 feet from the injection point. Mr. Holmes indicated that there was more iron seen in the boring located 17 feet from the injection point than in the closer ones, and that this could indicate a need to change the way the ZVI contractor injected the iron or cleaned their tool.

Mr. Ballard said there was a treatment area where reduction extended 40 feet from the injection point. He felt the region of influence was the most important point of the document as the team had never put the overall zone of influence to paper, they just knew that MW131 was reacting.

Mr. Morrison asked if iron had been detected in samples from MW131. Mr. Nelson responded that it had not. Ms. Gordon asked if the ZVI TS information would be used in the early implementation. Mr. Nelson said it would.

Ms. Gordon asked if there were to be monitoring points 40 feet out from injection points in the early implementation. Mr. Holmes said it was not the plan to monitor as in the TS. He noted that wells existed at different distances from the injection points. She then asked whether the team measured injection pressure or water pressure. Mr. Nelson explained that the team monitored injection pressure then measured water levels. Mr. Holmes said that only one well was located in the area showing contaminant reduction extending 40 feet, but the team agreed it made sense to extrapolate this finding to the early implementation. The early implementation action will be based on the data from the TS.

Mr. Nelson continued that it would be difficult to install monitoring wells up gradient of Area 1, as there were only a few accessible areas within the MLGW fence. Mr. Holmes indicated Area 2 would have up gradient and down gradient monitoring wells: MW161, about 60 to 70 feet and MW163, about 50 feet.

Mr. Ballard reminded the team that this was an early action, and that the team had discussed the TM earlier agreeing that it did not need to discuss Area 2 in terms of early action. He suggested calling it an opportunity to gather design data. He continued that Area 1 was being installed because of what the team perceived to be a need for early implementation. Area 2 was being accomplished to take advantage of mobilization.

Mr. Ballard questioned the necessity for injection points (12 and 13) in the area of the PRB. Mr. Nelson explained that these locations were based on his understanding that the objective was to reduce concentrations in that area Mr. Ballard agreed the goal was to reduce the 500 ug/L and greater concentrations.

Mr. Holmes said that at the last meeting the team was directed to split RDs for ZVI, so there would be an RD for ZVI and SVE on and adjacent to Dunn Field and another RD for ZVI off DDMT property throughout the plume. He said the team was looking at a much greater use of ZVI than before, and he questioned if PRB was still necessary. Mr. Nelson was not confident that ZVI alone would treat to meet MCLs. He said the discussion included looking at trade off areas and that the thickness of the PRB could be less than what was in the ROD.

Mr. Ballard said that PRB was supposed to treat to MCLs and that the team was discussing treatment within the 500 ug/L contours, so the PRB would be needed. He said that it may be in another location or installed differently than we originally thought. He felt it was premature to say whether PRB will be needed or not.

Ms. Gordon thought 500 ug/L was the cut-off for MNA. Mr. Ballard said that the 500 ug/L was not the end all for MNA. He continued that the team tried to determine what was feasible, but it was not feasible to put a PRB around the entire area and the high concentrations down gradient would be diluted for MNA to reduce it to MCLs. Then the concentrations increased in MW54 as the plume migrated or changed direction. Mr. Ballard said that some sort of treatment would be needed along the planned PRB line to capture concentrations from 50 ug/L to 500 ug/L. He continued that the objective of the early implementation action was to reduce high concentrations, so as not to over design the PRB.

Mr. Buxbaum said to keep in mind the off-site plume coming onto Dunn Field from the east and co-mingling. He said the Depot might have to do something about it even if TDEC identifies the source. Mr. Ballard said that putting in the ZVI and monitoring how long it worked would give the team an idea of what may be needed in the future. Mr. Morrison said that with the new data the team could optimize the PRB and install it where it was needed.

Mr. Holmes said he met with MLGW about access for monitoring wells and injection points. He reported that MLGW said additional access agreements would not be needed for this action. The meeting included all those from MLGW needed to determine the go/no go areas. He said there were power transmission lines MLGW could not de-energize. He felt that if the team needed to get around one of the towers then MLGW would find a way to make it happen. Mr. Nelson said CH2M Hill had survey the area to find the most accessible route for the PRB and that it may not be the location identified in the ROD. Mr. Ballard said that was OK.

Mr. Morrison said he was concerned about not treating out to the 100 ug/L contour and that it would be preferable to optimize the ZVI injection to reduce CVOC concentrations within the 100 ug/L contour. He said that concentrations just below 500 ug/L were outside the treatment area and that he would hate for so much contaminant mass to get past that area, if we had the potential to reduce concentrations close to 100 ug/L. He foresaw having to come back to make additional injections. Mr. Ballard said that the 100 ug/L contour was fairly close to the 500 ug/L contour. Mr. Nelson said that the ZVI treatment would produce a down gradient halo effect that could reach the 100 ug/L contour. Mr. Ballard said that the team settled on 500 ug/L because that was what MW154 showed at the time of the ROD.

Mr. Ballard said that the team probably would not know if any concentrations over 100 ug/L remained, so the team would not be able to conduct an additional injection at this time. He continued that there would be an opportunity when the team mobilized for ZVI injections in the source areas on Dunn Field to come back with additional injections. Mr. Ballard said he was confident the ZVI injection would not target all affected areas within the 500 ug/L because of access constraints.

Mr. Ballard said that last month the team talked about doing their best to treat all of the 500 ug/L given access. Mr. Morrison said he might want to step out a bit to get those areas. Mr. Holmes said the injection locations were set to overlap and that there were additional injections located more in the center to make sure treatment was focused within the most contaminated area to achieve good reduction throughout the entire part of 500 ug/L plume. He said that the plan was to get more iron and more flow through the central part of the plume so there would be a significant reduction of the contaminant mass.

Mr. Morrison said that it would be interesting to see MW158 and MW159 data and that if MW160 was clean or had low concentrations, then ZVI injections would not be needed there. Or if MW160 was really hot, then the team could come back later.

Mr. Ballard said that the day's goal was to approve the TM. He said that the action would capture some areas less than 500 ug/L and leave some that were over 500 ug/L. He continued that for this action, it was OK because the goal was to reduce concentrations in the central area of the plume. Mr. Nelson said that maybe MACTEC could produce a map showing the injection points after installing the wells.

Ms. Gordon asked if the team had taken a critical look at the cost differential saying she was concerned about this being a non-significant change. Mr. Ballard said that he and Mr. Buxbaum had talked to their attorneys and that there was no hard and fast rule about what makes it non-significant or significant. Mr. Buxbaum said there was some cost trade-off because of moving the locations.

Ms. Gordon said she thought the costs of the early action would be much more than the cost projections in the ROD. Mr. Ballard said that it was not significant if the RD projections indicated a refined cost estimate + 50 %/- 30 % from the ROD cost projections. Ms. Gordon said that the team had not looked at the cost of the early implementation plus the cost to complete the overall ROD remedy. Mr. Buxbaum said that driving the cost up was not a big deal. He said that if there was no change to the remedy then the team should track the costs, and if costs exceeded the + 50 % then the action may need an Explanation of Significant Differences (ESD). Mr. Ballard said no need for an ESD today. He said PRB costs might be on the minus side due to a smaller PRB. He said at this stage the team was treating the action as a non-significant change because groundwater remedy costs were $7 million, so $1 million for the early implementation was not 50% more than the ROD estimates. Mr. Dobbs said he understood that an ESD might become necessary due to increased costs and/or remedy effectiveness.

Mr. Morrison wanted the BCT to discuss the TM before agreeing to it. He said he did not have a problem with the conceptual nature of the TM, but he did not see any safety factor for capturing the 500 ug/L. The BCT then adjourned for a private conversation.

The BCT reconvened. Mr. Ballard said that as currently positioned the injection points did not reach the 500 ug/L contour. The BCT said to either spread the injection points apart so they were a little bit closer to the 500 ug/L area contour or consider shifting injection points located near the planned PRB (12 or 13). The BCT said to install some more monitoring wells to better identify the 100 ug/L contour, subject to access. Mr. Morrison said he was OK with increasing the total CVOC concentration that would be allowed to bypass the PRB from the 50 ug/L noted in the ROD to 100 ug/L. He said that dilution (MNA) would take care of the 100 ug/L CVOC plume down gradient from the treatment zones. Mr. Ballard said it was a trade off in costs at this time for more monitoring. If data indicated the need for more down gradient ZVI then it could happen during mobilization for the Dunn Field ZVI. He said the plan needed more monitoring, in addition to not as a replacement for currently identified points.

Mr. Holmes was concerned about the amount of definition requested by the BCT as some of the monitoring wells were about 125 feet apart and would provide a good idea of contamination levels. Mr. Miller said that the area looked big on the figure, but that the distance from MW158 to MW155 was about 230 feet. Mr. Buxbaum asked how many wells the BCT thought was sufficient

Mr. Holmes said that the team had located most of the contamination and asked why the team should not implement the TM, even if contamination showed at MW158 and MW159. Mr. Dobbs said that the BCT wanted to concur with the concept, but they wanted to make sure it included flexibility during field activities. Mr. Miller said that if the injections were near the leading edge then there would be some pass through.

Mr. Ballard thought there were enough injection points that could be reconfigured within the treatment zone. He was concerned that if the treatment left a core of contamination up gradient of the area intended for a flow through zone and if the flow was really slow moving through the

highly oxygenated aquifer then the treatment would be gone by the time the contamination reached it. Mr. Morrison said it seemed that every time the team discussed additional monitoring, the data indicates the need for more data. He wanted the team to think ahead and to install the wells now that would provide for all the data needs.

Mr. Holmes said that MW151 and MW152 data showed relatively low contaminant levels. He said that the needed data would come from MW158, MW159 and MW160. He continued that even if MW160 data indicated high concentrations, the injections could not go much farther north due to the MLGW substation. Ms. Gordon asked if the team felt comfortable with the current wells in terms of characterizing hydrogeologic conditions – particularly near MW140. Mr. Holmes said that he thought he had a pretty good understanding of where groundwater is going.

Mr. Morrison said that if the team believed they had a sufficient well strategy, then OK. Mr. Holmes said the wells would go in within the next few weeks. Mr. Nelson said that he would incorporate the TM comments and would refine the approach at the next BCT. Mr. Holmes said that given the access provided, he was satisfied with the proposed monitoring well placement. Mr. Miller said the spacing between wells was reasonable.

Mr. Nelson asked if the BCT wanted to finalize the TM or to wait until receipt of the data and the updated drawing. Mr. Ballard said not to hold up the TM. He also said that he needed to understand how Mr. Nelson would locate the injection points, unless Mr. Nelson felt the proposed locations in the TM met the objective. Mr. Ballard said the team was getting beyond his objective.

Mr. Dobbs said the BCT wanted to go forward with the TM, but they wanted the team to understand that the objective was to reduce mass within the 500 ug/L CVOC contour. Mr. Holmes said that the TM provided guidance to the field team as to the BCT objective and that the field team would abide by that guidance as much as possible given the access issues. Mr. Ballard said the after action report could note the access issues.

Mr. Morrison requested the addition of a 100 ug/L contour on Figure 7. Mr. Nelson will incorporate the comment into the TM.

Mr. Dobbs said that the TM should say that the BCT and the technical team have agreed that for the feasibility of early implementation without a more extensive design period, the treatment would leave levels less than 500 ug/L. He continued that the team knew about the off-site plume at the time of the ROD, but that the levels weren't so high so as to affect the remedy. He said that the team knew levels were pushing up, but that it was only after the ROD that the team received the data and determined a need to take action.

Ms. Gordon said that the TM indicated the need to take action within the 500 ug/L contour, but it does not state why 500 ug/L. Mr. Ballard suggested the rational indicate that the 500 ug/L contour appeared to be the extent of what was feasible to target for early action within the time limits for early implementation. Mr. Holmes noted the team has said it was necessary to knock down the mass so that MNA could take over.

Mr. Holmes said the general implementation plan was to inject ZVI, collect samples one month then three months out, and write the RA completion report (RACR). Mr. Ballard said that from a regulatory standpoint he did not see the need for a separate RACR, as the early implementation was a phase of the ZVI portion of the remedy. He would like to see a completion report, but

suggested calling it a preliminary completion or phase 1 completion report that would then be rolled into the RACR.

Notice of Land Use Controls

Mr. Buxbaum said to file the Notice of Land Use Controls soon. He said that Mr. Steve Offner was working the necessary maps to include survey bench marks for the affected areas and that the Memphis Depot team was setting a precedent for other bases. He said that his work on the project would probably end once TDEC approved the Notice. He also suggested pulling the ARAR compliance information straight from the RODs for use in the RDs.

BRAC Cleanup Plan Version 8

Mr. Ballard asked if the BCP was coming out for review soon. Mr. Holmes responded that MACTEC was working on the revision and was also working to update the schedule.

Schedule

Mr. Holmes anticipated starting the following projects in FY05: early implementation, disposal sites and Main Installation enhanced bioremediation. Mr. Ballard said he would need notification of mobilization to document the start of the RA.

Mr. Holmes said that monitoring well installation for the early implementation action was scheduled to begin October 4, 2004. Mr. Holmes pushed back the date to ensure resolution of all funding and access issues prior to mobilization.

October Restoration Advisory Board/Public Meeting Presentations

Mr. Holmes and Mr. Nelson confirmed that Mr. Nelson would provide the ZVI injection portion of the public meeting presentation.

Mr. Holmes distributed the agendas for the RAB meeting to be followed by the public meeting for the early implementation action. Mr. Dobbs indicated the need to ensure an adequate explanation of the action's objective – to reduce the contaminant mass within the 500 ug/L contour and leaving levels of 100 ug/L and less.

Mr. Ballard suggested keeping the Dunn Field information together, so that it flows better. He also suggested the Disposal Sites RD completion discussion include the RA start date. Ms. Gordon asked about the need to talk about the SVE field tests. Mr. Holmes did not think that necessary as the purpose was to provide information on the early implementation action and the completed RDs.

Mr. Ballard said the presentation needed to make clear that contamination would remain, but that it would be addressed by MNA as described in the ROD. The figure shows 500 ug/L as the bounding contour for this stage of the project and it must be clear that treating inside the contour is technically and economically feasible in a relatively short time. Mr. Morrison suggested discussing why MNA was appropriate for the levels that remain. Mr. Ballard said that if the objective was to reduce the high concentrations, then at some point you have to say when concentrations become suitable for MNA.

Ms. Gordon indicated the ROD identified this area for MNA, but the early implementation action area concentrations were above the levels used in the ROD assumptions for selecting MNA. So, this action was to reduce levels to within the range identified in the ROD for MNA. Mr. Ballard said that at the time of the ROD, contaminant concentrations greater than or equal to 500 ug/L

were targeted for active treatment. With the discovery of contamination greater than 500 ug/L down gradient of the proposed PRB, the BCT determined that engineered treatment is appropriate there as well.

Mr. Ballard suggested that EPA and TDEC be ready at the meeting to support the reasoning behind the use of MNA; the question comes down to professional judgment. He requested to review the slides prior to the meeting.

Mr. Dobbs said that Frontline requested all presentation information by September 30. Mr. Dobbs indicated there would be a presentation walk-through on October 20. When Frontline provides the draft presentation, Mr. Holmes would discuss it with Mr. Dobbs, and would then distribute it to EPA and TDEC. Mr. Holmes would ensure a RAB agenda be forwarded to Ms. Tiki Whitfield of EPA.

Mr. Holmes is to forward to Mr. Nelson fact sheets regarding enhanced bioremediation, MNA, and excavation and transportation prepared by Frontline and asked him to provide comments by COB next Wednesday.

RCRA Permit Update

Mr. Buxbaum said there was pressure from EPA Region 4 to change the nature of the permit application submitted to TDEC, but that TDEC was reluctant to make those changes. Mr. Buxbaum said he contacted EPA about their comments and that, upon further review, EPA Region 4 RCRA Program Branch determined there was no need for the permit. DLA planned to submit a formal letter as part of the RCRA permit public comment period requesting withdrawal of the permit application. He said that he was working with MACTEC to update the list of SWMUs and AOCs to better reflect the latest information from CERCLA design documents, technical memorandum, etc.

He said to make sure the BCP accurately reflected the final status of the SWMUs and to clearly indicate SWMU closure. Mr. Buxbaum will provide Mr. Dobbs the letter that must be submitted to TDEC by September 27.

Next Meeting

The BCT confirmed the next meeting to be held in Memphis, TN, on October 21 to coincide with the RAB meeting scheduled for the evening of October 21.

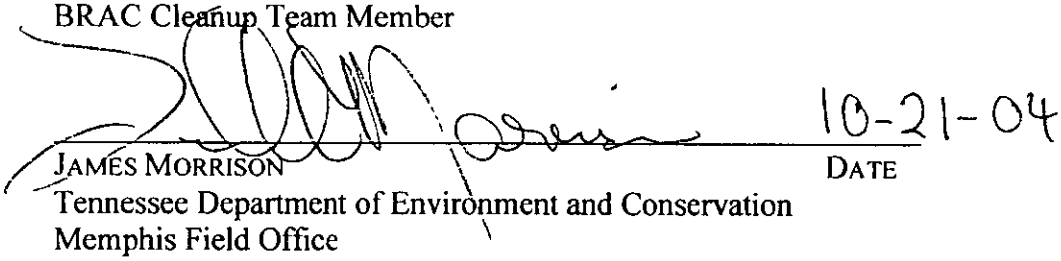
10/21/04

MICHAEL DOBBS — DATE
Defense Distribution Center
BRAC Environmental Coordinator
BRAC Cleanup Team Member

10/21/04

TURPIN BALLARD — DATE
Environmental Protection Agency
Federal Facilities Branch

Remedial Project Manager
BRAC Cleanup Team Member



10-21-04

JAMES MORRISON — DATE

Tennessee Department of Environment and Conservation
Memphis Field Office
Division of Superfund
BRAC Cleanup Team Member

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