GWOU ADMINISTRATIVE RECORD
SECTION TITLE:
GW-300-303-1.13

Department of Energy
Grand Junction Office
Weldon Spring Site
Remedial Action Project Office
7295 Highway 94 South
St. Charles, Missouri 63304

June 26, 2003

Mr. Dan Wall
Project Manager
Superfund Division
U.S. Environmental Protection Agency
Region VII
901 N. 5th Street
Kansas City, KS 66101

Dear Mr. Wall:

DRAFT FINAL PROPOSED PLAN FOR FINAL REMEDIAL ACTION FOR THE GROUNDWATER OPERABLE UNIT AT THE CHEMICAL PLANT AREA OF THE WELDON SPRING SITE

Enclosed are three copies of the above-referenced document, which presents the Department of Energy's plan for addressing groundwater contamination at the area of the former Chemical Plant. No significant comments to the draft were received that would change the proposed remedy selection of Monitored Natural Attenuation (MNA) for the contaminants in the groundwater. Institutional controls are proposed to assure unacceptable risks do not occur during the attenuation period. There are proposed contingency activities in the event MNA does not progress as expected.

This plan has been modified from the draft version issued March 13, 2003, based on comments from the Environmental Protection Agency (EPA), the Missouri Department of Natural Resources (MDNR), the Missouri Department of Conservation (MDC), the Missouri Department of Health and Senior Services (MDHSS) and the Missouri Department of Transportation (MoDOT). Also included are individual responses to the specific comments we received from these agencies. The plan has been reformatted in response to EPA comments. Detailed information previously included in the appendices of the draft Proposed Plan has been expanded upon and placed into a separate companion document. This document is titled "Supporting Evaluation for the Draft Final Proposed Plan for the Final Remedial Action for the Groundwater Operable Unit at the Chemical Plant Area of the Weldon Spring Site."

This document is a primary document under the Federal Facility Agreement (FFA) and is subject to a final agency review prior to public review. Due to

extensive coordination among the agencies, DOE is hopeful that additional informal comments can be worked to make any minor changes needed prior to issuance of the Proposed Plan to the public. DOE plans to finalize the Proposed Plan and make it available for public review within the next 30 days.

We appreciate the commitment of the time and resources of both EPA and MDNR to this matter. If you have any questions regarding the document, contact Tom Pauling at (636)926-7051.

Sincerely,

Pamela Thompson

Pamela Thompson
Project Manager
Weldon Spring Site
Remedial Action Project

Enclosure:
As stated

cc w/enclosure:
Mimi Garstang, MDNR
Peter Price, MDNR
Myrna Rueff, MDNR
Robert Geller, MDNR
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Bill McFarland, USACE
Dave Nelson, USACE
David Geiser, DOE EM-50(2)
Ray Plieness, DOE-GJO (3)
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Nancy Dickens, Weldon Spring Citizens Commission Technical Advisor

cc w/o enclosure:
Mary Picel, ANL
Becky Cato, S.M. Stoller
Terri Uhlmeyer, S.M. Stoller

RESPONSES TO COMMENTS ON THE DRAFT GWOU PROPOSED PLAN, DATED MARCH 2003
June 26, 2003

Missouri Department of Conservation

Specific	Comment	Response
1.	Based on Table A.1, the cost of Alternative 3 will be about $20 million over a 100-year period while the cost of *Alternative 8: In-situ Treatment of TCE Using In-Well Vapor Stripping* is about $43 million over a 100-year period, and the cost of *Alternative 9: In-situ Chemical Oxidation (ICO) of TCE Using Fenton-Like Reagents* is estimated to exceed $9 million (there was no indication of whether this was over a 100-year period or just capital costs). Why was natural attenuation selected over the treatment alternatives when their costs don't appear to be out of line in relation to the non-treatment alternatives? (It was not clear from Table A.1 what the costs of Alternatives 4 or 7 would be.)	The preferred alternative of MNA was selected not based on cost, but rather, it was selected because an effective treatment alternative could not be identified. This table has been revised to clarify the evaluation of alternatives.
2.	If a treatment alternative were used, how much sooner would be TCE and other chemicals of concern be reduced in the groundwater and would this reduce the costs of the treatment alternatives to be comparable or more favorable than the non-treatment alternatives?	An effective treatment alternative has not been identified. The pilot scale TCE treatment was temporarily effective in a localized area, but the concentrations have since rebounded. The pump & treat field study confirmed the low yield of the aquifer and demonstrated no advantages to accelerate clean-up timeframes from artificial recharge or extraction from an angled well.
3.	In addition, if the period of exposure to recreationists, workers, and so on, were reduced, would this reduce the risk?	Yes, the estimated risk for the recreationists and workers is directly proportional to the amount of exposure (how many times and the amount of groundwater ingested in this case). However, again, no treatment alternative has been identified which would reduce the time period that the contaminants would pose this potential risk.
4.	In the future, these chemicals may be determined to be more toxic to humans and/or ecosystems than presently believed. If so, will the level of risk need to be reevaluated and treatment then implemented? Will it not be more costly to do this at some future date than at the present?	The toxicity of chemicals may be reevaluated by EPA and health authorities in the future. Potential risk could go up or down depending on the revision made. DOE would consider such changes during the 5-Year Review process to determine if the selected remedy is still protective. It is not cost effective to attempt to anticipate these potential changes in advance.

Environmental Protection Agency

General	Comment	Response
1.	The purpose of the proposed plan is to facilitate public involvement in the remedy selection process primarily by summarizing information that is presented in greater detail in other documents. However, the types of information presented in the draft proposed plan and the manner of presentation are more appropriate to an FS than to a proposed plan. This additional FS information needs to be made available and is an important part of the record; however, we think there would be a great benefit to preparing both another supplement to the FS, which could include some of the more detailed information, and a more traditional proposed plan, which would summarize in concise form relevant information from the supplemental FS and other documents. This approach would be more consistent with the CERCLA remedy selection process in the NCP and EPA guidance.	A separate report to provide the supporting information that was currently included in the draft Proposed Plan has been prepared as a companion document to the Proposed Plan. While we agree that some of this information directly effects the feasibility of certain alternatives, it generally confirms what was already known about the site hydrogeology. The information regarding the implementation of the MNA monitoring program belongs in a post-ROD RD/RA Work Plan.
2.	We recommend that the supplemental FS focus on new information and analysis developed since the interim record of decision (IROD) was issued in September 2000. This would include an evaluation of the results of the in-situ oxidation (ICO) response action, an evaluation of the results of the enhanced pump and treat field tests, the reevaluation of the feasibility of monitored natural attenuation (MNA) the reevaluation of remediation time frames, the detailed MNA monitoring strategy, and the progress made in the evaluation and determination of institutional controls (ICs). We don't recommend re-including or reiterating information or conclusions from the original FS or FS Supplement except to the extent it helps explain the current state of the decision-making process.	The companion document is titled *Supporting Evaluation for the Proposed Plan for the Final Remedial Action for the Groundwater Operable Unit at the Chemical Plant Area of the Weldon Spring Site.* This document summarizes information previously provided in numerous reports culminating in the May 2002 *New Estimates of Groundwater Cleanup Times at the Weldon Spring Chemical Plant Area*, the June 2002 *Pilot Scale Test Report – In-Situ Chemical Oxidation of TCE in Groundwater* and the July 2002 *Completion Report for the Additional Groundwater Field Studies in Support of the Groundwater Operable Unit.* The progress on institutional controls has been discussed within the context of the site's stewardship planning documents.
3.	The proposed plan should be a readily understandable document on the order of 10 to 15 pages focusing on summary presentation of site contaminants, risks, the remedy selection process, the preferred alternative, and the public participation process. See the example plan in Appendix A of "A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Documents" OSWER 9200.1-23P. In this case, the proposed plan will also need to address the proposed change to the IROD if it is intended that this change will be documented in the groundwater record of decision (ROD).	A shorter version of the Proposed Plan has been prepared as suggested. Additional language has been added to specifically address the intention to close out the IROD.

EPA Comments (contd)		
General	**Comment**	**Response**
4.	For the public to be able to participate effectively in the remedy decision-making process it's important for them to understand the information being presented for comment. Therefore, we recommend adding a glossary of terms to define some of the specialized terms used in the document, e.g., glacial drift, preglacial deposits, residuum, overburden, weathered, unweathered, vugs, core loss, hydraulic conductivity, confined aquifer, unconfined aquifer, alluvial aquifer (all found on pg. 5 in the Site Background), groundwater divide, topographic high point, karst conduit system, physical and chemical degradations, losing stream, hydrogeologically complex groundwater system, fractures, conduits, paleochannels, dissolution/weathering features (on page 6), etc.	A glossary of terms has been included in the revised Proposed Plan.
5.	Since the main purpose of the proposed plan is to facilitate public comment, we recommend including more information about the public participation process, e.g., information about the public comment period, public meeting, location of the administrative record, how DOE will respond to comments, etc., in the introduction of the proposed plan. We also recommend including a brief discussion of the roles of the different agencies involved (i.e., identify the lead and support agencies) and an outline of the remaining steps in the remedy selection process in this introductory section.	The suggested information has been added to the revised Proposed Plan.
Specific	**Comment**	**Response**
1.	Section 1 Introduction, pg.1, line 1 – The proposed plan presents a preferred alternative, not the final remediation strategy, which will come in the ROD.	The intent was to convey that the preferred alternative for the final groundwater remediation strategy was being presented, as opposed to the preferred alternative to yet another interim action on the groundwater. The text has been revised to clarify.
2.	Section 1 Introduction – We recommend including a brief description of what the IROD addressed, e.g., TCE contamination in zones 1 and 2 of the Chemical Plant Area, and how this proposed action fits in with the remedial action decisions made in the IROD.	Text has been added to include the requested information.
3.	Site Background, introductory paragraph, pg. 5 – In connection with mention that the Chemical Plant lies within the boundaries of the Ordnance Works, we suggest including a little more information about the Ordnance Works itself, e.g., what it is, how big it is, who controls it, and that it also is the subject of a CERCLA cleanup by the Army under another 120 FFA.	Text has been added as requested.

EPA Comments (contd.)		
Specific	**Comment**	**Response**
4.	Site Background – The relevancy to remedial action selection of the information presented about geology, hydrogeology, surface water, land use and demography, and groundwater use is not always very clear. Also, this information does not portray a very clear picture of the geologic cross section of the Chemical Plant. At the proposed plan stage, the primary focus of the information ought to be on (1) what contamination has been found where and at what levels and (2) why finding contamination at those locations and levels is significant from the standpoint of remedy selection. The proposed plan as written does not tie together very well general background information with contaminant information to make clear how the two types of information fit together in the remedial action decision.	Text has been revised to clearly convey the information as suggested.
5.	Site Background Section – Two areas where we might want to consider adding more background information are (1) a brief history of the origin of the contamination and (2) a summary of past investigation and response actions. Some of this information, especially about past investigations and response actions, is presented in various parts of the proposed plan, e.g., the introduction to section 3 and section 6. However, it is not clear that the contamination resulted from certain historical activities at the site which no longer happen (so there is no more contamination being released to the environment that could get into the groundwater) and past response actions have largely removed the sources which cause the groundwater contamination being addressed by this decision (so this action is aimed at residual groundwater contamination only).	The information requested has been added.
6.	Section 2.1.2 Hydrogeology, pg. 7, ¶ 2 – Burgermeister Spring is not identified, as such, on Figure 2.2. Is it the same as SP 6301?	Burgermeister Spring is now identified in the figure.
7.	Section 2.1.5 Groundwater Use, pg. 9 – We suggest including more quantitative information about what EPA considers a potentially usable aquifer.	Additional quantitative information has been included in the revised PP.

EPA Comments (contd.)		
Specific	**Comment**	**Response**
8.	Section 2.1.5 Groundwater Use, pg 10, 1st paragraph – This information should be made clearer. The description does not indicate what the private wells are used for and the general statements regarding their location and construction are confusing. We assume the intent is to explain that good construction information on many of these wells is not available, and that most wells are designed to intercept that deeper, higher yielding groundwater units rather than the shallow low yielding units impacted by the site; however, some of these wells may be constructed in a fashion that leaves them open to contribution from the shallow units. The discussion should briefly describe any efforts by DOE or others to identify and/or sample private wells and where to look for more information. This discussion may raise questions as to whether any of these private wells down gradient of the site are within range to be affected by contamination from the chemical plant and potentially provide an exposure point or provide a vertical pathway for contaminant migration. We suggest that the discussion address these questions directly.	The text has been revised to provide a discussion regarding groundwater usage between the Chemical Plant site and the discharge point for groundwater (Burgermeister Spring) for impacted groundwater from the site. A general discussion regarding groundwater usage in the area near the Chemical Plant is also included. As suggested, a summary of the sampling performed by the Missouri Department of Health (now Missouri Department of Health and Human Services) has also been included.
9.	Section 2.2 Nature and Extent of Contamination, pg. 10 – The discussion on nature and extent of nitroaromatic compounds should include a description of the relationship to the Weldon Spring Ordnance Works site.	Text has been added to provide the information requested.
10.	Section 2.2.1 Groundwater, pg. 10, bottom ¶ – Why is the historical maximum value considered to be a "suspect value" in the last line on the page? Does this conclusion in any way affect the recommended remedial action, and, if so, how?	The value was considered analytically suspect because it was not confirmed in subsequent sampling. The elimination of this particular data point does not alter the conclusions that have been made to date regarding the impacts of TCE at the site.
11.	Section 2.2.1 Groundwater, pg. 12 – Wouldn't it be appropriate to discuss how TCE concentrations were affected by the pilot-scale ICO of TCE conducted in 2002? How significant is the decline in TCE concentrations and to what extent is it related to the ICO response action versus natural attenuation?	Text has been added to the revised Proposed Plan to provide the discussion requested. TCE concentrations within the area of influence of the pilot ICO were reduced significantly to below detection limit levels. The decrease is a direct result of the ICO process implemented although a small portion could be attributed to MNA or the introduction of large amounts of potable water during the artificial recharge stages of the pump & treat field study.

EPA Comments (contd.)		
Specific	**Comment**	**Response**
12.	Section 2.2.2 Springwater, pg. 16, 1st paragraph – This suggests that low levels of TCE are routinely detected in SP 6303. We thought this was an historic, isolated occurrence. We suggest this section refer to Figure 2.2 showing the springs and drainage areas. We also suggest that Burgermeister Spring be identified on the figure.	TCE has been reported 5 times at levels barely above the reported detection level of 1 μg/l in samples collected in 1997 and 1998. In 75 other samples taken from 1997 to 2002 TCE has been reported below the detection limit. This data has been shared with EPA and MDNR and has been among the data extensively discussed as part of the development of the MNA monitoring program. References to the figure showing the locations of the springs has been added to text and Burgermeister Spring is now identified on the figure.
13.	Section 4.1 Human Health Risk Assessment – The only COC discussed in any detail in this section is uranium. We recommend adding more quantitative information about the calculated risks, rather than just including conclusory statements about what risks are acceptable and which are not. We recommend clearly stating revised risk calculations if any revision have been made to reflect the additional sampling data gathered or any other new risk information developed since the BRA was completed. We suggest including some discussion of the rationale for using MCLs as cleanup criteria, including whether they are considered to be ARARs, TBCs, etc.	Additional information regarding risks and COCs has been added as requested. Discussion regarding MCLs as cleanup criteria or ARARs has been added to the Section on Remedial Objectives. A more detailed ARAR analysis will be provided in the Record of Decision.
14.	Section 4.2 Ecological Assessment – We suggest including a reference to the reports of the biotic surveys, toxicity testing and uptake modeling referenced in this section and be sure to include those reports in the administrative record.	A reference has been added to the revised PP.
15.	Section 5 Remedial Action Objectives – At the proposed plan stage we should be identifying *the* remedial action objectives for this action, not *preliminary* remedial action objectives as referenced in paragraph 3, so this section needs to be revised to make clear what the remedial action objectives are for this action. Also, use restrictions are a part of the response strategy for which objectives need to be outlined.	Text has been revised to clarify.

EPA Comments (contd.)		
Specific	**Comment**	**Response**
16.	Section 6 Analysis of Alternatives – It may be more appropriate to call this section a summary of the alternatives than an analysis of the alternatives. In theory, a more detailed analysis of the alternatives would be included in an FS (or a supplemental FS) so this section would more of a brief reporting of the results of that analysis than the actual analysis. While it is important to make available the results of the 2002 in situ chemical oxidation pilot scale tests (section 6.1), the 2001 field studies (section 6.2), and MNA analysis (Table 6.1), MNA Time frames analysis (Appendix B), MNA Performance Monitoring Strategy (Appendix C), Comparative Analysis of Alternatives (Table A.1), etc., the level of detail in which this information is presented is more appropriate for an FS than a proposed plan. Since a discussion of the alternatives considered is one of the key parts of the proposed plan, it should be in the body of the proposed plan, not in tables in an appendix. This brief narrative description of the alternatives should include relevant information about each alternative's ability to meet RAOs, cost, time to implement, key ARARs and the ability of the alternative to comply with those ARARs, etc. Perhaps a slightly briefer version of Section A.1 in Appendix A, with more quantitative information as identified above, would be OK. This brief summary of the alternatives should be the logical basis for a discussion of the recommended alternative. Note that this analysis should be updated to incorporate alternatives and information being reexamined as part of this supplemental process and not be limited to a presentation of alternatives as they were presented in the original FS.	A summary of the alternatives as described has been included in the revised PP.
17.	Section 6.1 In-Situ Chemical Oxidation of TCE Implemented in 2002, pg. 31 – Reference the ICO supporting documentation. The description tends to refer to the pilot-scale treatment as a "study". From a Superfund process standpoint, it would more accurately be described as a phase 1 remedial action. Also, explain what is meant in the last paragraph on this page which seems to indicate that "other areas" could have or should have been targeted.	The reference has been included in the revised PP. Text has also been revised to reflect suggested changes.
18.	Section 6.2 Additional Field Studies Conducted in 2001, pg. 32 – Reference the supporting documentation.	The reference has been included in the revised PP.
19.	Section 6.3 Approach for Identifying a Final Groundwater Decision, pg. 33-34 – Discussion on the potential efficacy of MNA should touch on the lines of evidence identified in EO\PS's Guidance "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites" (OSWER Directive Number 9200.4-17P), i.e., explain how historical groundwater data shows a clear decreasing trend supported by statistical analysis, and explain how hydrogeologic and geochemical data were used to identify the types of attenuation processes and the rates at which such processes are expected to occur.	Suggested information has been included.

EPA Comments (contd.)		
Specific	**Comment**	**Response**
20.	Section 6.3 Approach for Identifying a Final Groundwater Decision, pg. 33-34 – Here or anywhere the case is made, the judgment that remediation time frames are "reasonable" should be more directly supported by the expectations outlines in regulation and guidance. For example, the National Contingency Plan (NCP) sets out the expectation that groundwater be restored to its beneficial use within a timeframe that is reasonable given the particular circumstances of the site. In this case, the particular circumstances of the site include the low likelihood that the groundwater will be used for drinking water purposes, and the expectation that use restrictions are readily assured through governmental control. Also, the NCP preamble suggests that a "reasonable" timeframe for a remedy relying on natural attenuation is generally a "...timeframe comparable to that which could be achieved through active restoration." These concepts are reinforced in the guidance. If true, information supporting these judgments should be presented.	The reasonableness of the MNA timeframes is discussed within the site-specific context, as suggested.
21.	Section 6.3 Approach for Identifying a Final Groundwater Decision, pg. 34, last paragraph – With respect to item 5, we suggest that meeting ARARs and avoiding the need to waive ARARs is a redundancy, and that the second part of the statement should be omitted.	Text has been revised as suggested.
22.	Table 6.1 Site Characteristics Suitable for Selecting MNA, pg. 35 – The first column contains the phrase "Some TCE reduction achieved by ICO process.", which is a site-specific characteristic and probably intended to be in the second column. In the last paragraph of the second column, the meaning of the first sentence is not clear.	Text has been revised to clarify.
23.	Table 6.1 Site Characteristics Suitable for Selecting MNA, pg. 35 – The table indicates that it lists site characteristics suitable for MNA as identified in EPA guidance. While we don't disagree that these are desirable characteristics for an MNA candidate and that these factors are addressed in various forms in EPA guidance, we don't find that particular list in EPA's guidance. The guidance does contain a different list of factors that should be considered in determining whether MNA is appropriate. We are not suggesting that guidelines in the proposed plan must have a one-to-one correspondence with what is contained in the guidance, but we found it difficult to compare and contrast the lists and determine whether all factors have been addressed.	This discussion has been revamped and is now in the Supporting Evaluation document.
24.	Table 6.1 Site Characteristics Suitable for Selecting MNA, pg. 35 – The thread of logic contained in the last characteristic in the second column should be made more clear. This probably refers to the expectation in the guidance that contingency remedies generally be included as part of a MNA remedy which has been based primarily on predictive analysis as opposed to documented trends of decreasing contaminant concentrations.	Text has been revised to clarify.

EPA Comments (contd.)		
Specific	**Comment**	**Response**
25.	Section 7 Proposed Action, pg. 37 – We suggest including the full name "monitored natural attenuation" preceding the acronym MNA at this point, since many readers will likely jump directly to the description of the proposed action.	Although the Proposed Plan has been significantly shortened, we also made the change suggested, using the name rather than the acronym at the beginning of the Preferred Alternative section.
26.	Section 7.1 Description of Proposed Action – It might be more appropriate to call this the preferred alternative than the proposed action. The proposed plan should include a sufficiently detailed description of the preferred alternative so that the public can comment meaningfully on it, which the draft proposed plan does not do. Is the preferred alternative the same as alternative 3 or is it a modified alternative 3? If it's a modified alternative 3, explain how it is modified and what effects the modifications have with respect to the evaluation criteria. Alternatively, modify the description of alternatives and the comparative analysis to reflect the current position. Are possible institutional controls, which are briefly touched on in ¶ 2, discussed in greater detail in some other document that could be referenced and included in the AR, especially information pertaining to the implementability and long-term enforceability of Ics.	Changes have been made consistent with this comment. Institutional controls are discussed in more detail in the draft *Long Term Surveillance and Maintenance Plan*, May 2003, which is referenced in the revised Proposed Plan.
27.	Section 7.1 Description of Proposed Action – While the goals are listed, the monitoring strategy and the performance objectives are not very clear. The monitoring strategy detailed in Appendix C is too difficult for the average reader to interpret. We think it would improve understanding of the plan to include a simple conceptual description of the performance objectives and the monitoring strategy. The performance objectives could be summed up in a description of how DOE anticipates that the plumes will behave over time as indicated by monitoring data and consistent with the expectations in the guidance that plumes are stable and concentrations are decreasing with time. Generally, the monitoring strategy is to set observation points within a plume, at the perimeter of a plume, and downstream of a plume. Trigger concentrations indicative of unexpected or unacceptable trends are established at these monitoring points. Based upon the nature of the identified trend, contingency measures will include (1) reevaluation of contaminant data; (2) re-sampling, etc - as currently presented. The monitoring concept could be illustrated through schematic representation showing a plume, a property line, and a midway monitoring point with assigned trigger values.	Text that describes the concept involved in the performance monitoring strategy has been provided in the revised PP and the Supporting Evaluation report. The details of the draft monitoring strategy is retained in the Supporting Evaluation report, which indicates that finalization of this design will occur in the RD/RA Work Plan. We did not include a schematic or figure of the monitoring concept in the revised reports because we think the text description that has been added provides a simple enough explanation and should serve the same purpose.
28.	Section 7.1 Description of the Proposed Action, pg. 37, 1st paragraph – The wording of goal number 3 is somewhat confusing. We suggest that the goal for TCE and the goal for the other COCs be articulated separately. We also suggest eliminating the double negative. In the last sentence, we suggest that the goal for TCE is to "refine" and/or "confirm" existing information with respect to vertical extent, rather than "delineate" vertical extent which suggests an initial characterization effort.	Changes have been made consistent with this comment.

EPA Comments (contd.)		
Specific	**Comment**	**Response**
29.	Section 7.1, pg. 37, 2nd paragraph – The discussion on institutional controls should describe the affected landowners and the status of any discussions with third party landowners regarding the acceptability of the proposed restrictions and any roles they are expected to perform.	Text has been added to discussions of ICs to indicate the affected surrounding landowners and briefly describes the general acceptance of the required restrictions. This text appears in both the revised PP and the Supporting Evaluation report. Again the draft LTS&MP provides additional detail in this regard. Since negotiations are sensitive and ongoing, a detailed status has not been provided in the revised PP.
30.	Section 7.1, pg. 37, 3rd paragraph – Contingency measures are part of this proposed action, as opposed to something that "would also be developed" as part of this proposed action. We suggest following this information directly with the explanation of Appendix C so the reader immediately understands that details are provided elsewhere. With respect to activity number 6, the active contingency for TCE should be better described. It should be explained that ICO is identified as a specific active contingency remedy for TCE because it is a treatment option shown to have some effectiveness at reducing TCE concentrations at the site. No such option has been identified for the other contaminants. Where is the basis for the conclusion that the active response action for TCE would be similar in scope to the IROD ICO process? Some discussion should be provided on the CERCLA process (RD/RA) that would be undertaken to implement the contingency action.	The revised PP indicates that the ICO contingency remedy will be further developed in the RD/RA Work Plan. The "hot spot" scope agreed upon among the agencies describes the conceptual design as being similar to the pilot-phase action, i.e. two wells and at least two injections.
31.	Section 7.2 Comparison to NCP Criteria, pg. 38 – A number of the identified remedial alternatives, and in fact, all viable remedial alternatives must be protective, meet ARARs, and be cost-effective. The objective of the process is to identify the alternative that provides the best balance of trade-offs among the alternatives when evaluated against the balancing criteria. The discussion should explain why the proposed alternative falls out of the comparative analysis as the best choice.	Text has been revised as suggested. Alternatives that are not implementable have been eliminated from the comparative analysis.
32.	Table 7.1 Analysis of DOE's Proposed Action Using the Nine Criteria, pg. 41 – The description of costs should include a present worth value. The state acceptance modifying criterion does not appear on the table. Presumably, the plan is to add this after receiving further input from the state.	Present worth cost estimates are included in the revised PP.
33.	Section 8 Community Participation, pg. 43 – This section should explain that a responsiveness summary will be prepared that addresses how the comments were accommodated or considered in the remedy selection process. See also, general comment 5 above.	Information has been provided in the revised PP as suggested.

EPA Comments (contd.)		
Specific	**Comment**	**Response**
34.	A.1 Description of Final Alternatives, pg. A-3 – Presumably, groundwater use restriction through institutional control is a component of each alternative other than the No Action alternative. The descriptions of the various alternatives should indicate so. Information on restoration timeframes provided under Alternatives 3 and 4 should be updated to reflect the current thinking.	The descriptions of the alternatives have been revised to make it clear to the reader whether IC is a component of the alternative or not.
35.	A.1 Description of Final Alternatives, pg. A-3 – The differences between Alternatives 2 and 3 should be explicitly identified, e.g., MNA differs from long-term monitoring in that performance standards are developed based on predicted rates of attenuation, and contingency measures are identified in the event MNA doesn't perform as predicted. The specific contingencies associated with non-performance should be described.	Information has been provided in the revised PP and in the Supporting Evaluation report, as suggested.
36.	A.2 and/or Table A.1 Comparative Analysis of Alternatives, pg A-6 – A summary analysis should be provided explaining why the preferred alternative provides the best balance of trade-offs among the alternatives when examined against the primary balancing criteria.	Information has been provided in the revised PP and in the Supporting Evaluation report, as suggested.
37.	Table A.1 Overall protection of human health and the environment – It is not clear what the term "adequately protective of human health and environment" means in the context of CERCLA remedy selection criteria. Assuming what DOE means is that the risk ranges and hazard indices calculated in the BRE would all be in the acceptable range, that statement is not true for Alternatives 1 and 2, and possibly the other alternatives relying upon groundwater extraction/chemical injection which probably are not effectively implementable at this location.	The table has been revised to reflect the changes suggested.
38.	Table A.1 Overall Protectiveness of Human Health and the Environment – All of the alternatives are described as adequately protective. The descriptions should indicate that protectiveness is achieved over the long-term (until such time as ARARs are achieved) through groundwater use restrictions in the form of institutional control; and, as such, Alternative 1: No action, which includes no institutional control is not considered to be protective.	The table has been revised to reflect the changes suggested.
39.	Table A.1 Compliance with ARARs – Alternative 1: No Action should not be described as an alternative that meets ARARs since it contains no mechanism for measuring whether or not this is the case.	The table has been revised to reflect the changes suggested.
40.	Table A.1 Compliance with ARARs – We recommend stating what at least the key ARARs for each of the alternatives, rather than just including a summary statement as to compliance or non-compliance with ARARs.	The table has been revised to reflect the changes suggested.

EPA Comments (contd.)		
Specific	**Comment**	**Response**
41.	Table A.1 Long-term effectiveness and permanence – All of the alternatives are described as effective. Since there are unacceptable future risks for the future resident scenario (see pg. 24, ¶ 4) which are not addressed, the alternatives, as they are described here, should not be described as affording long-term effectiveness and permanence. It was our understanding that institutional controls were intended to be a component of each alternative except for the no action alternative and that they would be used to preclude groundwater use for the estimated 100 years it will take for protective levels to be achieved. If so, the descriptions should be modified to indicate that effectiveness is achieved over the long-term (until such time as ARARs are achieved) through groundwater use restrictions in the form of institutional control; and, as such, Alternative 1: No Action, which includes no institutional control is not considered to be effective. It is important to provide some information about the nature of the institutional controls DOE has in mind (a "real state restriction preventing access to groundwater") and how they would be implemented, to evaluate the effectiveness and overall protection of human health during this 100-year period.	The table has been revised to reflect the changes suggested. Institutional controls are described in the draft LTS&M Plan and will be further developed in the RD/RA Work Plan.
42.	Table A.1 Long-term effectiveness and permanence – The statements regarding the active alternatives convey the impression that these options would effectively treat groundwater, to protective levels. These statements need to reflect the judgment that the active remediation options are not expected to be significantly more effective than natural attenuation in restoring the groundwater to protective levels and that effectiveness over the foreseeable future will rely on use restrictions.	The table has been revised to reflect the changes suggested.
43.	Table A.1 Reduction of toxicity, mobility, or volume through treatment – For alternatives 1, 2, and 3, the correct answer would seem to be an unqualified "none".	The table has been revised to state that no reduction of toxicity, mobility, or volume through treatment would be achieved by the alternatives in question.
44.	Table A.1 Implementability Alternatives 4, 7, and 8 – The ability to implement these alternatives effectively seems to be the main basis DOE used not to select one of them as the preferred alternative, but it is difficult to tell that from the information presented here. If DOE doesn't think these alternatives are implementable, they should come out and say so in more affirmative terms.	The table has been revised to include only the alternatives that are implementable.
45.	Table A.1 Implementability Alternative 9 – While this discussion talks about what would be necessary to implement this alternative, it reaches no conclusions about whether this alternative could be implemented.	A conclusion stating that full treatment of TCE is not implementable has been included in the revised PP and the Supporting Evaluation report.
46.	Table A.1 Cost – Present worth values should be provided for each alternative so that adequate comparisons can be made. For Alternative 1, include an estimated even if it is considered to be $0.	Present worth values for viable alternatives have been included in the revised table.

EPA Comments (contd.)		
Specific	**Comment**	**Response**
47.	Appendix C: Proposed MNA Performance Monitoring Strategy for Groundwater Contaminants of Concern at the Chemical Plant Area – It is extremely difficult to use the information here and in the following tables to gain a grasp of the objectives or the strategy. Even a person with a background in hydrogeology, a strong familiarity with the site, and a lot of patience would find it a daunting task. We suggest that a conceptual overview of the steps taken to address each objective would be extremely helpful.	A conceptual overview of the monitoring strategy has been provided in the revised PP.
48.	Appendix C, pg. C-14 – Please clarify what is meant by ICO Rebound Monitoring.	The intent of this objective, suggested by MDNR, is to monitor a selected well that was influenced by the pilot ICO to observe any recurrence of TCE concentrations. Data trending would lead to a greater understanding of the implementability and long-term effectiveness of this alternative.
49.	Tables C.1-C.4 Rather than having to remember what letter refers to each objective, we suggest spelling out the objective across the top of the page. It would be helpful to indicate what zone a given well is monitoring and/or indicate whether it is providing horizontal or vertical control on contaminant migration.	The format for these tables has been revised to indicate the requested information.
50.	Table C.4 – The strategy for nitroaromatic compounds is unclear. What is the rationale for deferring some objectives but not others pending the USACE ROD for the Ordnance Works site? If there is sufficient technical basis, we recommend that the DOE clearly identify the preferred alternative for nitroaromatic compounds, and not defer aspects of the decision pending outcome of the USACE decision process. It may be appropriate to provide a footnote to the effect that USACE is evaluating remedial action for nitroaromatic groundwater contamination at the Weldon Spring Ordnance works site.	The preferred alternative for nitroaromatic compounds has been clearly stated in the revised PP. No deferral to the Army has been included in the revised PP.

Missouri Department of Natural Resources		
General	**Comment**	**Response**
1.	The plan's action levels and monitoring locations are not consistent with technical group's development meetings. The contaminant plumes are not fully characterized, particularly in the vertical direction. The current plan does not adequately provide protective action levels, sufficient monitoring points, or definition of plume extent.	The action levels and monitoring locations are consistent with the technical group's discussions, although they are not exactly what MDNR has suggested. They are considered draft at this time and are discussed in the Supporting Evaluation report to the PP, pending further discussion and finalization in the RD/RA Work Plan.

Missouri Department of Natural Resources (contd.)		
General	**Comment**	**Response**
2.	Long-Term Stewardship is not defined in the plan. Institutional controls are not given sufficient enough detail to know what will be used, how it will be used, when it will be used and why its use is effective and cost efficient as compared to other alternatives. The remedy proposed in the plan is predicated on the premise that enforceable Institutional Controls are available to prevent future groundwater use for many decades, yet little information is presented on the specific controls to be employed. As an integral part of the remedy, Institutional Controls must be evaluated and detailed to the same degree as the technical specifications for the proposed monitoring activities. The major components of enforceable institutional controls must be fully addressed in order to consider them a part of a remedy. EPA guidance is clear on this and must be followed.	The draft Long Term Surveillance and Maintenance Plan has been discussed and referenced in the revised PP. Institutional controls are discussed in the revised PP and reference is made to the LTS&MP.
3.	While not directly related to comments on the plan, the issue of having the state as a co-signatory to the revised Federal Facility Agreement is vital to assurance of regulatory enforcement of the ROD and stewardship plan.	Comment noted.
Detailed Comments		
1.	Section 1, Introduction, paragraph 1. Suggest the following revision to the first sentence "The PP presents the final remediation strategy for addressing contaminated groundwater resulting from operations at the Chemical Plant area including off-site areas (i.e. areas from the chemical plant to Burgermeister Spring and in the Southeast drainage from the chemical plant to the Missouri River."	A revision has been made to this introductory sentence to include a reference to springs.
2.	Section 2, Site Background. Suggest adding reference to the on-site waste disposal cell, overlying the contaminated groundwater and the corresponding Disposal Cell Groundwater Monitoring Plan.	The disposal cell has been depicted on the contaminant distribution figures; therefore, the reader can see the relationship of the cell to the contaminant plumes. Reference to the disposal cell plan is not pertinent to the preferred alternative to address groundwater at the Chemical Plant. Reference to the 5 monitoring wells for the disposal cell has been made in the text.
3.	Section 2.1.1 Geology, paragraph one, p. 5. The first sentence of the test states "porous, unconsolidated deposits" overlie bedrock. Not all of the overburden units are correctly characterized as porous. Nor are the unconsolidated deposits uncomformable on bedrock. Deleting the first sentence is recommended.	Text has been revised and sentence has been deleted.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
4.	Section 2.1.1 Geology, paragraph one, p. 5. The term "overburden" includes all of the surficial material units, including loess and residuum, in addition to glacial and pre-glacial units, described in the second sentence. It is unclear if the thickness of the "overburden" only includes the glacial and pre-glacial deposits or if this refers to the thickness of all the surficial materials units. Clarification should be provided.	Text has been revised to a more general discussion of the overburden unit and the thickness provided in the text is inclusive of all the units present at the Chemical Plant site.
5.	Figure 2.2 Springs and Drainage Areas in the Chemical Plant Area, p. 8. Burgermeister Spring and the Southeast Drainage are not specifically identified on this figure. These two locations are mentioned in the text, paragraphs two and three, p. 7 (refers readers to Figure 2.2). The general public would not likely know that Burgermeister Spring is Spring 6301 and the Southeast Drainage is drainage valley 5300. Burgermeister Spring (SP 6301) is only specifically located later in the document, on Figure 7.1. Burgermeister Spring and the Southeast Drainage should be specifically identified on Figure 2.2, or their locations explained in the text, page 7.	The figure and text have been revised to identify Burgermeister Spring and the Southeast Drainage by name.
6.	Section 2.1.5 Groundwater Use, paragraph one, p. 10. Because state law did not require owners of private domestic wells to register them until 1987, there may be more than 23 active private wells within the four-mile radius of the site that are not represented in state archival records. Because state records may be incomplete, a survey of private well use, downgradient from the site, should be conducted to determine the locations of the closest private wells that have the potential to be impacted.	A survey of the area between the Chemical Plant and the discharge point (Burgermeister Spring and Dardenne Creek) was performed by the landowner (MDC). No private wells were identified. The remainder of the wells discussed is a compilation of all possible databases to identify groundwater usage in the area. None of the wells are along the flow path from the Chemical Plant; however, they were discussed to illustrate the limited usage of groundwater in the area and to show that groundwater has not been impacted in these areas. A survey of wells outside the MDC property is not warranted.
7.	Section 2.1.5 Groundwater Use, paragraph one, p. 10. According to the text, three private wells (within a four-mile radius of the site) identified in archived state files are open to the deeper bedrock aquifers (i.e., Kimmswick and St. Peter). These were established in order to obtain sufficient well yields and are greater than 1,000 ft. deep. The department conducted a search of two in-house databases and determined that the only wells within the four-mile radius and greater than 1,000 feet deep are irrigation and public water supply wells, not private domestic water wells, which require greater depths for the higher yields. The existence of deeper wells for high yield is not unusual and it is not clear why these wells are specifically mentioned.	The text regarding groundwater usage has been modified and this discussion has been deleted.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
8.	Section 2.1.5 Groundwater Use, paragraph one, p. 10. This paragraph implies that all current residents in the area of the plant are on municipal water. This contradicts paragraph 2 on page 10, which identifies 23 active private wells in the area. It must be clear that domestic use of the aquifer exists in the vicinity of the site. Is the public well serving the Weldon Spring heights included in this well inventory? It should be noted and included in the inventory.	The text regarding groundwater usage has been modified and this discussion has been deleted.
9.	Section 2.2.1 Groundwater, paragraph two, p. 10. It is stated in this paragraph that TCE contamination "is limited to the weathered portion of the shallow aquifer." This statement is supported by only one well (MW-4007), which monitors the unweathered-zone Burlington-Keokuk wells within the outline of the TCE plume. There are no unweathered-zone Burlington-Keokuk wells that monitor those areas of the plume with the highest TCE concentrations in the weathered portion of the aquifer. Therefore, the vertical extent of TCE contamination remains uncertain.	DOE has agreed to install an unweathered well with MW-4037 to monitor for possible movement into the unweathered unit along the leading edge of the plume, similar to the monitoring proposed in MW-4007.
10.	Section 2.2.1 Groundwater, paragraph five, p. 12. The range of uranium concentrations from data collected in 2002 presented in this paragraph is not correct, based on data provided to the department by DOE. According to the uranium data table for 2002, the range of concentrations was from 0.1 to 59.9 pCi/l. The maximum uranium concentrations for MW-3030 and MW-3024 are also incorrect. The maximum uranium concentration for MW-3030 was 56.6 pCi/l and for MW-3024 the concentration was 59.9 pCi/l. The text should be corrected to reflect actual sampling results. The recent high concentration for MW-3024 is significant because it monitors the unweathered unit of the aquifer of concern. The presence of uranium at this concentration in the unweathered unit has important implications for the monitoring system discussed later in this Draft Proposed Plan.	The data presented in the draft version of the Proposed Plan was correct and complete as of March 2003. Data from Q402 has not been verified and merged into the database at the time. Data provided to MDNR included Q402 data. The discussions regarding contaminant concentrations has been updated to reflect maximum concentrations accounting for Q402 data. Also, see the Response #12 regarding comment about MW-3024.
11.	Figure 2.4 TCE Contamination Contour for 2002 at the Chemical Plant Area, p. 13. It is not specified on Figure 2.4, nor in the text, if the TCE contours are based on the average, minimum or maximum concentration levels. Nor is the basis of the contoured concentrations identified on the other contaminant of concern figures.	The isoconcentration contours depicted on the figures represent the distribution of the average concentrations for 2002. This will be identified on the figures.
12.	Figure 2.6 Uranium Contamination Contour for 2002 at the Chemical Plant Area. There are no unweathered wells located east or southeast of the uranium plumes illustrated in this figure. It also appears that the plume drawn around MW 3024 incorporates data from weathered zone wells with data from MW 3024, an unweathered zone well. The justification for this is not clear, particularly in light of the fact that the two zones exhibit different characteristics: e.g. the weathered zone well, MW 3025, adjacent to MW 3024 has a higher water level and lower uranium concentration than MW 3024. Additional unweathered wells are required in these locations to further characterize the horizontal and vertical extent of uranium contamination.	The data from MW-3024 was used to depict the distribution of uranium because data from this well likely represents impact from the weathered zone. This conclusion has been made based on hydrologic information for this location and inference from behavior of other unweathered wells at the Chemical Plant.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
13.	Figure 2.6 Uranium Contamination Contour for 2002 at the Chemical Plant Area. Please add units of measure to all the contamination contour maps.	Comment noted. The figure has been revised.
14.	Section 2.2.2 Springwater, paragraph two, p. 16. It should also be mentioned in the document that SP-6303 has had concentrations of nitrate higher than the MCL in the past.	The discussion in the text reflects current groundwater and spring water conditions.
15.	Section 2.2.2 Springwater, paragraph three, p. 16. The presence of uranium at Burgermeister Spring at higher levels than groundwater at the Chemical Plant during high flow conditions is attributed to residuals in the fractured zones. The claim that the source of higher levels of uranium is residuals in fractures has not been proven. The text should be revised to indicate that this source of uranium is an undocumented speculation.	DOE does not agree. This discussion has been presented in numerous documents, including the Remedial Investigations for both the Chemical Plant (1992) and this operable unit (1997). Data collected from the spring during high flow and low flow conditions have supported this theory.
16.	Section 3, Scope and Role of the Proposed Action, paragraph 2, page 21. Suggest the following: replacing the phrase "at the Chemical Plant area" with "resulting from operations at the Chemical Plant area..."	The phrase "at the Chemical Plant area" has been used throughout the CERCLA process. It appears in the title of every document pertaining to this operable unit. While the MDNR suggested phrase is at least as descriptive, for the sake of continuity we will retain "at the Chemical Plant area."
17.	Section 4.2 ECOLOGICAL ASSESSMENT, p. 25. The text states "An evaluation of the aquatic community...does not appear to be adversely affected by contaminant concentrations." This suggests some affect was observed on the aquatic community. The department believes an assessment of the continuing impact to the ecology, due to residual contamination, including routine fish tissue sampling analysis should be developed to study this affect into the future. This would provide a means to evaluate the impacts of leaving contamination in the soils, springs and groundwater. It will also keep the public informed about the health of the local fish populations, and possible risks, if any, of consumption.	The text cited was intended to conclude that the aquatic community is not adversely affected by site contaminant concentrations. However, additional fish sampling has been included in the preferred alternative as part of the contingencies being planned.
18.	Section 7.1 DESCRIPTION OF THE PROPOSED ACTION, p. 37. The plan states additional goals for TCE are to delineate the vertical extent of contamination. This goal pertains to all contaminants of concern in both the vertical and horizontal direction. Please update text to state all COC will be delineated in the vertical and horizontal extents	DOE does not agree with this comment. We agreed that an additional well or two would be appropriate for TCE since that contaminant was discovered later than the others and a case could be made for supplemental information. Fifteen years of monitoring and the Remedial Investigation have fully examined the vertical and horizontal extent of contamination at the Chemical Plant site.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
19.	Section 7.1 DESCRIPTION OF THE PROPOSED ACTION, p. 37. Institutional Controls are proposed as the primary means in which the site remains protective. Currently, this plan includes one paragraph explaining the details of these institutional controls, with no reference to the Long-Term Stewardship Plan. This lack of detail and reference is unacceptable. The department requests DOE provide more details on ICs, including the implementability and costs associated with them. This information should be included in Table 7.1. The Long-Term Stewardship Plan must also be referenced in this plan and in the ROD. The plan relies solely on institutional controls for the prevention of future groundwater use. This type of control will have to be used for many decades, based on current model predictions. With this in mind, a rigorous evaluation of implementability, enforceability, sustainability and cost is required in order to compare with other remedial alternatives. Recent EPA guidance on this issue provides a very clear direction on how this should be considered as a component of a remedy; none of which is utilized in this proposed plan or associated Feasibility Studies. Please proved the necessary comparative evaluation and details for this aspect.	The draft Long Term Surveillance and Maintenance Plan is discussed and referenced in the revised PP. Institutional controls are discussed in the revised PP and reference is made to the LTS&MP.
20.	Figure 7.1 Institutional Controls Location Map for the Chemical Plant Area, p. 39. The dashed-line symbol used to identify the Groundwater Use Restriction Area for the larger scale illustration of the Chemical Plant area, is different from the solid-line symbol used for the smaller scale illustration of the assumed (unlabeled) Groundwater Use Restriction Area which includes Lake 36 and Burgermeister Spring. It is suggested that the symbols used to identify the Groundwater Use Restriction Area be consistent in both illustrations.	The figure has been revised to be consistent regarding the boundary for the institutional control.
21.	Appendix A, Alternative 7: Removal and On-Site Treatment of Groundwater in the Vicinity of the Raffinate Pits, paragraph one, p. A-5. The discussion of the alternative is very brief. No methods on on-site treatment are provided, only the estimated number of vertical extraction wells is included. At a minimum, some of the treatment options which were considered for Alternative 7 should be mentioned in order to be consistent with the description of the other alternatives.	The discussion regarding alternatives has been completely revamped in both reports and includes alternatives determined to be implementable. This alternative was not carried forward due to implementation problems related to groundwater extraction and injection.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
22.	Appendix B, Table B.1 Revised MNA Predictive Clean-up Times Using the Flushing Model, 2,6-DNT, page B-5 and Figure 2.8 2,6-DNT Contamination Contour for 2002 at the Chemical Plant area, page 18. Several questions have been raised concerning the consistency of the contouring of the data for 2,6-DNT. For example, Contour 5 (0.13 contour) could encompass a much larger area than depicted by the three small plumes directly east, north and northwest of the disposal cell. It is unclear why the plume is depicted as three small plumes versus one large plume, considering there are no non-detect data points between them. The north boundary of Contour 5 (0.13 contour), for the large plume located on the east side of the disposal cell, should be extended farther toward MW-4015 because the concentration at MW-4014 is closer to 0.13 µg/l than the concentration at MW-4015. Another example of inconsistency between Table B.1 and the contoured data occurs at MW-2005, which is listed for Contour 3, falls outside the plume in Figure 2.8, but has a concentration of 0.27 µg/l according to the table.	Isoconcentration contours were drawn based on the annual averages of the data from 2002, groundwater flow direction, subsurface geology, and known source areas (TNT production lines and waste lagoons). Sufficient data were not available to connect the plumes as suggested in this comment. The contours used for the flushing models are not those shown in the document. The maximum values for each location measured during 2002 was contoured to establish the maximum area of contamination. This has been noted on the flushing calculation tables. The figures in the Proposed Plan were created using the annual averages for each location. Some peripheral wells may not fall within the outside contours unless they were consistently at or above the standard for each COC.
23.	Appendix C, objective (1), p. C-3. The Objective B trigger concentrations within the plume for nitrate and uranium are unacceptable. The department requires a more protective approach including the following Objective B concentrations for nitrate and uranium. The technical review team has not yet developed appropriate nitroaromatic compound triggers. Nitrate – 1000 mg/l Uranium - 100 pCi/l	These trigger levels require more discussion and finalization in the RD/RA Work Plan. This objective, that MNA is occurring as expected, should only trigger a reevaluation of the MNA time frames if a substantial rise occurs at locations within the plume that could not be attributed to natural downgradient dispersion.
24.	Appendix C, objective (1), p. C-3. Two additional objectives are identified for TCE. One of these objectives is to delineate the vertical extent of TCE contamination. This goal pertains to all contaminants of concern in both the vertical and horizontal direction. Please update text to state all contaminants of concern (COC) will be delineated in the vertical and horizontal extents.	DOE does not agree with this comment. We agreed that an additional well or two would be appropriate for TCE since that contaminant was discovered later than the others and a case could be made for supplemental information. Fifteen years of monitoring and the Remedial Investigation have fully examined the vertical and horizontal extent of contamination at the Chemical Plant site.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
25.	Appendix C, Table C.1 Proposed MNA Performance Monitoring for TCE. According to the table, a previously proposed unweathered-zone well, UW-2 (to be located near MW-3034) was deleted from this monitoring plan. The identified unweathered-zone well, UW-1 (originally to be located near existing well MW-4031) has now, according to this table, been relocated to the MW-4037 area in the leading edge of the TCE plume. Without these wells in the highest TCE concentration areas, a remedial objective of MNA, to verify that vertical expansion of the TCE plume is not occurring, cannot be accomplished. The previous agreement of the technical review team was to install two new unweathered monitoring wells, one adjacent to MW-4031 and one next to MW-3034. These new wells are necessary to properly delineate the vertical extent of TCE contamination and will help fulfill Objective A. DOE should take the appropriate precaution during installation to minimize migration caused by improper installation techniques.	Further discussion is needed regarding the appropriate location of new wells. See response to comment #18. These details should be finalized during the RD/RA process.
26.	Appendix C, Table C.1 Proposed MNA Performance Monitoring for TCE. The proposed Objective C trigger of 75 µg/l TCE at monitoring well W-1 is unacceptable. This trigger should be 10 µg/l at this location. The In-situ Chemical Oxidation (ICO) hot spot trigger should also be 10 µg/l.	These trigger levels require more discussion and finalization in the RD/RA Work Plan.
27.	Appendix C, Table C.1 Proposed MNA Performance Monitoring for TCE. The contingency of no treatment if the center of the plume has dissipated to <300 µg/l is unacceptable. A concentration of <50 µg/l to limit treatment is acceptable. This criteria appears throughout the document, please update the text throughout.	This trigger level requires more discussion and finalization in the RD/RA Work Plan.
28.	Appendix C, Table C.1 Proposed MNA Performance Monitoring for TCE. The proposed Objective C trigger concentration at MWS-1, 20µg/l is unacceptably high. A more appropriate trigger concentration for MWS-1 located at the federal property boundary would be a more protective concentration level of 5 µg/l (the MCL).	This trigger level requires more discussion and finalization in the RD/RA Work Plan.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
29.	Appendix C, Table C.2 Proposed MNA Performance Monitoring for Nitrate. No characterization (Objective A) wells are included in this table to confirm the extent of the nitrate plume in the vertical direction. Without these wells beneath the highest nitrate concentration areas, a remedial objective of MNA, to verify that the vertical expansion of the nitrate plume is not occurring, cannot be accomplished. The department recommends installation of three wells in the unweathered portion at location of MW-3024, MW-3026, and MW-4011. These, in addition to new monitoring wells nested at MW-4031 and MW-3034, will be used to help delineate the nitrate contamination in the unweathered zone. DOE should take the appropriate precaution during installation to minimize migration caused by improper installation techniques.	The nitrate data for the 3 mentioned wells likely represents impact from the weathered zone. This conclusion is based on hydrologic information and present and historical contaminant data from unweathered wells at the chemical plant. The vertical and horizontal extent of contamination for the groundwater COCs at the Chemical Plant site was fully examined in the Remedial Investigation. Other unweathered wells, MW-3006, MW-4007, MW-2021, and MW-2022 are located beneath areas of high nitrate contamination in the weathered zone. Further discussion is needed regarding the appropriate location of new wells. The details should be finalized during the RD/RA process.
30.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Nitrate, Rationale for Selection column, page C-15. Two wells, MW-3026 and MW-4011 are listed as wells that monitor the unweathered bedrock unit. These unweathered unit wells show nitrate concentrations ranging from approximately 100 to 200 mg/l. If contaminants exist in the unweathered unit, appropriate monitoring locations within the unweathered unit should be included in the plan to monitor for potential spreading of these plumes.	The number and location of new wells requires more discussion and finalization in the RD/RA Work Plan. DOE's position is that, except for 2 additional wells for TCE, the monitoring network is adequate. Data from these two wells likely represent impact for the weathered zone. This conclusion has been made based on hydrologic information for this location and inference from behavior of other unweathered wells at the Chemical Plant.
31.	Appendix C, Table C.2 Proposed MNA Performance Monitoring for Nitrate, Trigger Concentration or Event column, second bullet, page C-15. The proposed trigger concentration of 1,500 mg/l is too high. A more appropriate concentration would be 1,000 mg/l. If the concentration exceeds 1,000 mg/l the probability that natural attenuation MNA standard Objective B is being accomplished would be in doubt.	This trigger level requires more discussion and finalization in the RD/RA Work Plan.
32.	Appendix C, Table C.2 Proposed Performance Monitoring for Nitrate, Trigger Concentrations or Event column, third bullet, page C-15. The proposed trigger of 1,000 mg/l (average of the high three concentrations) in this plan is too high. The MNA timeframes should be recalculated if the average of the high three consecutive concentrations exceeds 600 mg/l.	This trigger level requires more discussion and finalization in the RD/RA Work Plan.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
33.	Appendix C, Table C.2 Proposed MNA Performance Monitoring for Nitrate. An additional Objective C well is necessary to monitor the leading edge of nitrate contamination as it migrates off-site. This well should be located to the north of the plume and north of MW-4013. Further discussion on the specific location of this well is needed.	The number and location of new wells requires more discussion and finalization in the RD/RA Work Plan. DOE's position is that, except for 2 additional wells for TCE, the monitoring network is adequate.
34.	Appendix C, Table C.2 Proposed MNA Performance Monitoring for Nitrate. The Objective C monitoring well trigger is unacceptable. The trigger should be 10 mg/l instead of the proposed 500 mg/l.	This trigger level requires more discussion and finalization in the RD/RA Work Plan.
35.	Appendix C, Table C.2 Proposed MNA Performance Monitoring for Nitrate. The Objective C, D spring trigger is unacceptable. The trigger should be 10 mg/l instead of the proposed 100 mg/l.	This trigger level requires more discussion and finalization in the RD/RA Work Plan; however, given that this concentration already exists at one of these springs, it seems unnecessary to generate new calculations with unchanged data.
36.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium. The table does not include Objective A characterization monitoring wells. Three new wells in the unweathered portion are required at the location of MW-3024 and MW-3030 southeast of MW-3024. These will be used to help delineate the uranium contamination. The plan must include un-impacted monitoring points in the unweathered zone (one for each of the two plumes) beneath the areas of highest uranium concentration. DOE should take the appropriate precaution during installation to minimize migration caused by improper installation techniques.	The uranium data for MW-3024 likely represents impact from the weathered zone. See response to comment #12. Well MW-4007 does monitor groundwater quality downgradient from this area. Further discussion is needed regarding the appropriate location of new wells. The details should be finalized during the RD/RA process. The vertical and horizontal extent of contamination for the groundwater COCs at the Chemical Plant site was fully examined in the Remedial Investigation.
37.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium. Trigger Concentration or Event column, second bullet, page C-22. The Objective B trigger is unacceptable. The trigger should be 100 pCi/l uranium instead of the proposed 300 pCi/l. No basis for the trigger concentration of 300 pCi/l is provided in this plan and the department does not consider 300 pCi/l a reasonable trigger concentration. Based upon historical records the lower concentration of 100 pCi/l is appropriate. Alternatively, use the same test given in the first tier, to determine trigger concentrations for Objective B wells.	This trigger level requires more discussion and finalization in the RD/RA Work Plan.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
38.	Appendix C, Table C.3 proposed MNA Performance Monitoring for Uranium, Contingency Action column, fourth bullet, page C-22. If the unexpected high concentration of 300 pCi/l occurs for two consecutive quarters with confirmatory sampling a more active response than recalculating MNA timeframes should be required. Some suggestions include: 1) determine why concentrations are increasing up to 300 pCi/l, 2) reevaluate and possibly change the site model, and 3) investigate possible unknown or un-remediated sources of contamination.	These new suggested contingency actions require more discussion and finalization in the RD/RA Work Plan.
39.	Appendix C, Table C.3 proposed MNA Performance Monitoring for Uranium, Contingency Action column, page C-22. Another contingency action should be added to the second tier for Objective B wells. Because the size of the plume directly affects the MNA timeframe calculation, the contingency action of recalculating MNA timeframes should be initiated if the size of the contaminant plume changes significantly.	The objective B locations will not indicate if the size of the plume increases. That is addressed with objective C wells.
40.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium, Monitoring Locations column, page C-22. An unweathered-zone well MW-3024 and a weathered-zone well MW-3030 are both Objective-B wells for uranium monitoring. The two wells are monitoring different bedrock units, unweathered and weathered. This is another reason why additional unweathered-zone wells beneath both uranium plumes are necessary to fully delineate the vertical extent of uranium contamination.	The data from MW-3024 was used to depict the distribution of uranium because data from this well likely represents impact from the weathered zone. This conclusion has been made based on hydrologic information for this location and inference from behavior of other unweathered wells at the Chemical Plant.
41.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium. The Objective C trigger is unacceptable. The trigger should be 20 pCi/l uranium instead of the proposed 100 pCi/l.	This trigger level requires more discussion and finalization in the RD/RA Work Plan.
42.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium, Trigger Concentration or Event column, first bullet, page C-23. For locations consistently below 5 pCi/l, the trigger concentration should be 15 pCi/l instead of 20 pCi/l (the MCL.) Such a significant increase in concentration should be evaluated before the MCL is reached. Setting the trigger concentration below the MCL would be consistent with the MNA monitoring plan for TCE.	This trigger level requires more discussion and finalization in the RD/RA Work Plan.
43.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium, Trigger Concentration or Event, second bullet, page C-23. A concentration of 20 pCi/l with confirmatory sampling should be set as the trigger for recalculation of MNA timeframes.	This trigger level requires more discussion and finalization in the RD/RA Work Plan.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
44.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium, Contingency Actions column, third bullet, page C-23. FFA signatories should be identified as the parties who will jointly determine the appropriate monitoring locations.	The addition of appropriate monitoring locations would constitute a revision of the RD/RA Work Plan and/or the Long Term Surveillance and Maintenance Plan, both primary documents subject to the provisions of CERCLA. This type of administrative process detail seems out of place in a table depicting technical issues.
45.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium, Contingency Actions column, fifth bullet, page C-23. The trigger concentration of 100 pCi/l is too high. 20 pCi/l should be used as the trigger to initiate the recalculation of MNA timeframes contingency action.	This trigger level requires more discussion and finalization in the RD/RA Work Plan.
46.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium, Trigger Concentration or Event column, second bullet, page C-24. The proposed second-tier trigger concentration at 300 pCi/l is fifteen times the MCL at this point of exposure. A trigger concentration of 100 pCi/l, though higher than the MCL, is reasonable, based on recent sampling results and is more protective than the proposed concentration.	This trigger level requires more discussion and finalization in the RD/RA Work Plan; however, given that this concentration already exists at three out of four of these springs, it seems unnecessary to generate new calculations with unchanged data.
47.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium, Contingency Actions, Second bullet, page C-25. One of the contingency actions, as written, is based upon a baseline level for uranium monitoring, however, a description of how the baseline is determined has not been provided for Objective E in the preceding column.	Text will be added regarding the establishment of baseline levels. Again, this draft design information will be included in the Supporting Evaluation as an example of how the MNA monitoring program will be established, but it will be finalized in the RD/RA Work Plan.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
48.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium. The following wells should be monitored: Location / Objective / Rational MW-3036 / C / UW Well downgradient of uranium contamination MW-3031 / C / Monitor uranium contamination near both MW-3030 and MW-3024 MW-3039 / C / Monitor uranium contamination near both MW-3030 and MW-3024 MW-UW?? (new well) / C / Monitor uranium contamination, unweathered well north of MW-3025 MW-UW?? (new well) / E / Upgradient unweathered location MW-2055 / E / Upgradient weathered location MW-W?? (new well) / G / Hydrologic measurements in weathered, 400' north of MW-3025, near disposal cell	The number and location of wells requires more discussion and finalization in the RD/RA Work Plan. See also responses to comments #18 and #33.
49.	Appendix C, Table C.3 proposed MNA Performance Monitoring for Uranium Location column, page C-25. Weathered well Mw-2035 is the only proposed Objective-E well for the uranium monitoring plan. It appears that MW-2035 may by in a cross-gradient location rather than upgradient from the uranium plumes. Also, MW-2035 is located a greater distance from the plumes that other possible monitoring locations. The department suggests that MW-2055 and the new UW-1 be used for Objective-E wells instead of MW-2035.	The number and location of wells requires more discussion and finalization in the RD/RA Work Plan. See also responses to comments #18 and #33.
50.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium, Monitoring Locations column, page C-26. Only established TCE and Nitrate Objective G wells are proposed for uranium Objective G wells. A weathered well should be installed north of MW-3024 for this objective because there is insufficient coverage in the area.	The number and location of wells requires more discussion and finalization in the RD/RA Work Plan. See also responses to comments #18 and #33.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
51.	Appendix C, Table C.3 Proposed MNA Performance Monitoring for Uranium and Figure 2.6 Uranium Contamination Contour for 2002 at the Chemical Plant Area. One uranium plume is supported by only one weather Objective-B well, MW-3030. Apparently, MW-4036 was not sampled in 2002. If MW-4036 had been sampled and remained at the 2001 concentration, the plume represented by 2002 data would be larger and therefore the MNA timeframes would be longer. MW-3037, north of this uranium plume, was not sampled in 2002, and may have had a similar influence on the size of the uranium plume. This potential impact should be evaluated.	Data from surrounding wells were evaluated in order to establish the isoconcentration lines depicted on the figures.
52.	Appendix C, Table C.4, Proposed MNA Performance Monitoring for Nitroaromatic Compounds, Monitoring Locations column, page C-27. No Objective A wells (unweathered-zone wells) are proposed in this plan. One MNA remedial objective, to verify that vertical expansion of the nitroaromatic plume is not occurring, cannot be accomplished unless unweathered Objective A wells are located in the areas of highest nitroaromatic concentrations. A sufficient number of unweathered-zone wells should be installed to meet this objective for nitroaromatics.	The vertical and horizontal extent of contamination for the remaining COCs at the Chemical Plant site was fully examined in the Remedial Investigation. Further discussion is needed regarding the appropriate location of new wells. The details should be finalized during the RD/RA process.
53.	Appendix C, Table C.4 Proposed MNA Performance Monitoring for Nitroaromatic Compounds, Rationale for Selection, third bullet, page C-28. According to Table C.4, 2,4-DNT is present at 0.13μg/l in well MW-2052. However, MW-2052 is not within the 0.11 outer contour interval illustrated in Figure 2.7. The contour should be redrawn to include MW-2052 in the 2,4-DNT plume located east of the disposal cell.	The contaminant distribution figures in the Proposed Plan were created using the annual averages for each location. Some peripheral wells may not fall within the outside contours unless they were consistently at or above the standard for each COC.
54.	Appendix C, Table C.4 Proposed MNA Performance Monitoring for Nitroaromatic Compounds, Trigger Concentration or Event column, first bullet, page C-28. It is assumed that the baseline levels discussed in this bullet are determined from intra-well baseline levels. If this is not a correct assumption, a description of how baseline levels are established should be included.	Commentor is correct regarding establishment of baseline conditions.
55.	Appendix C, Table C.4 Proposed MNA Performance Monitoring for Nitroaromatic Compounds, Contingency Actions, third bullet, page C-30. Because B-2 wells are discussed on this page, it is suspected that "B-1" included in this bullet should be "B-2".	Commentor is correct regarding the typographical error.

Missouri Department of Natural Resources (contd.)		
Detailed	**Comment**	**Response**
56.	Appendix C, Table C.4 Proposed MNA Performance Monitoring for Nitroaromatic Compounds, MW-3003, Rationale for Selection column, second bullet, page C-31. B-2 wells are located in the northwest not the northeast portion of the site as stated in this bullet.	Commentor is correct regarding the typographical error.
57.	Appendix C, Table C.4 Proposed MNA Performance Monitoring for Nitroaromatic Compounds, MW-3003, Rationale for Selection column, third bullet, page C-31. The concentration for 2,4-DNT is given as mg/l. The concentration unit for 2,4-DNT in the rest of Table C.4 is µg/l. The correct units should be provided.	Commentor is correct regarding the typographical error.
58.	Appendix C, Table C.4 Proposed MNA Performance Monitoring for Nitroaromatic Compounds, Monitoring Locations column, page C-33. No springs in the Southeast Drainage are proposed for nitroaromatic monitoring. Monitoring for nitroaromatic compounds at springs in the Southeast Drainage should be included.	The number and location of springs to be sampled requires more discussion and finalization in the RD/RA Work Plan. DOE's position is that since nitroaromatics are not found in the upper SED springs, and since Army operations are known to have had impact to a tributary which contributes to the SED south of these upper springs, then nitroaromatic contamination in the lower springs is entirely attributable to the Army operations and should be the subject of appropriate Army monitoring as part of Army CERCLA activities.
59.	Appendix C, Table C.4 Proposed MNA performance Monitoring for Nitroaromatic Compounds, General Comment. There are no proposed Objective G wells located east of the disposal cell, specifically in the Frog Pond area. Objective G well(s) should be added in this area.	The number and location of wells requires more discussion and finalization in the RD/RA Work Plan.
60.	Appendix C, Table C.4 Proposed MNA Performance Monitoring for Nitroaromatic Compounds. The department reserves further comment on this table until a later date. The technical review team is currently working through this table and expects to have comments soon.	Comment noted.

Missouri Department of Health and Senior Services (DHSS)		
Detailed	**Comment**	**Response**
	Because of the high use and visibility of the Busch Wildlife Area public-fishing lakes, we believe that a routine fish tissue sampling analysis plan needs to be developed. This would be an excellent and highly understandable method to communicate to the public regarding the protectiveness of the groundwater plan.	DOE has modified its proposed MNA monitoring approach to accommodate fish sampling in the event that uranium concentrations at Burgermeister Spring reach the historical highs that occurred during the timeframe of our comprehensive biouptake sampling efforts.
	We would like a commitment from DOE for funding that would ensure that DHSS could continue its' independent off site private drinking water well analysis program surrounding this site.	DHSS (then MDOH) has conducted private water well sampling in the surrounding area since 1982 and to our knowledge has never identified a contamination issue attributed to the DOE site. Given our understanding of the groundwater flow patterns and the locations DHSS monitors, DOE cannot technically and financially support this monitoring program. DOE will continue our monitoring program in the impacted areas and the potentially impacted areas.
Missouri Department of Transportation		
	MHTD is referenced throughout the report. This should be changed to Missouri Department of Transportation (MoDOT) throughout the document – See section 2.1.4 – Land Use and Demography. The Missouri Highway and Transportation Commission (MHTC) usually owns the property and right-of-way managed by MoDOT".	Revised as per comment.