STATE OF MISSOURI
Mel Carnahan, Governor • Stephen M. Mahfood, Director
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF ENVIRONMENTAL QUALITY
P.O. Box 176 Jefferson City, MO 65102-0176

April 6, 1998

Stephen H. McCracken
Project Manager
U.S. Department of Energy
Weldon Spring Site Remedial Action Project
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Certified Mail / Return Receipt Requested
Receipt No. P 162 259 091

Stephen K. Iverson
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Kansas City District
Corps of Engineers
Attn: MD-H
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Dear Messrs. McCracken and Iverson:

We have reviewed the draft final *Feasibility Study for Remedial Action for the Groundwater Operable Units at the Chemical Plant Area and Ordnance Works Area, Weldon Spring, Missouri*, ("Feasibility Study" or "FS"). The FS for the Groundwater Operable Units (GWOU) was prepared jointly by the U.S. Department of Energy (DOE), the Responsible Party (RP) for the Weldon Spring Chemical Plant (WSCP), and the U.S. Department of the Army (the Army), the RP for the Weldon Spring Ordnance Works (WSOW).

Major comments on the draft final FS are listed below.

- **The "all or nothing" approach eliminates potentially viable alternatives.** It appears that DOE and the Army screen out any remedial alternative that involves more expense than mere monitoring or which cannot cleanup all contaminants throughout the entire site.

  E.g., Alternative 7, "Removal and Ex-Situ Treatment of TCE-Contaminated Groundwater," would have the following benefits:

  - "The TCE concentration in groundwater at the WSCP and the WSOW would be below the ARAR of 5 μg/L."
  - "TCE migration would be largely halted."

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- "Any potential future large-scale contamination by TCE of the aboveground springs would be effectively prevented."

- "Extraction and treatment of TCE-contaminated groundwater would also reduce the concentrations of other contaminants (e.g., nitrates and nitroaromatic compounds) that also exist in the TCE-contaminated groundwater at the WSCP near the raffinate pits."

- The alternative "would satisfy the statutory preference for treatment as a principal element of remediation and provides reduction in toxicity, mobility, or volume of the contaminated groundwater through treatment."

Nevertheless DOE and the Army declare this alternative has the highest cost. This is based on highly uncertain estimates of the number of wells required to remediate *all* TCE-contaminated groundwater above cleanup standards. For the WSOW, the estimates vary from 12 to 5,380 wells; for the WSCP, the estimates vary from 258 to 1,080 wells. It should also be noted that of the 258 wells estimated for the WSCP 111 are estimated for a single cluster of wells; another estimate of 299 wells for the WSCP 200 are estimated for "zone 1." For the WSOW, as well, for one estimate of 28 wells, 20 wells are for a single contaminated zone.

In addition to the well clusters and contamination zones identified in Appendix C of the FS, other possible candidates include nitrate-contaminated groundwater north and south of the raffinate pits, uranium-contaminated groundwater north of the raffinate pits, and 2,4-DNT-contaminated groundwater in the northeast corner of the WSCP.

We repeat our suggestion that DOE and the Army identify localized areas of high contamination ("hot spots") and evaluate the feasibility of remediating individual hot spots. DOE and the Army should not limit their evaluation to alternatives which remediate all hot spots.

- **Migration of TCE contamination south of the Chemical Plant across the groundwater divide remains a significant risk.** "The areal extent of TCE contamination at the site extends from east of Raffinate Pit 3 to the south and southeast of Raffinate Pit 4." FS, p. 1-18. Assuming, as suggested by DOE, that the raffinate pits are the source of the TCE, contamination has apparently flowed south, *toward* the groundwater divide (See FS, Figure 3.7, p. 3-34.). This behavior is not completely inexplicable since TCE, which is denser than water, could migrate against the flow of groundwater. We reiterate our comment made during our review of the GWOU *Remedial Investigation*: What investigation has been made of TCE migration south across the groundwater divide?

- **The justification for waiver of groundwater cleanup standards is incomplete.** The need for a Technical Impracticability (TI) waiver is suggested, but no details on the scope of the waiver are given, and the technical justification is flawed and incomplete. DOE and the Army have not yet clearly identified the ARARs or cleanup standards for which the TI waiver is sought and the areas over which the TI waiver will apply. A TI waiver is not a blanket waiver, i.e., groundwater cleanup standards are not necessarily waived for all contaminants throughout the affected areas and for all time.

- **Reliance on institutional controls shifts responsibility for protecting the public to innocent landowners.** Institutional controls should not substitute for active response measures as the sole remedy unless such measures that actually reduce, minimize, or eliminate contamination are not practicable. Treatment and permanent remedies are preferred over simply preventing exposures

through legal controls. Institutional controls are a necessary supplement when waste is left in place, when there is no practicable way to actively remediate a site, or when they are the only means available to protect human health.

DOE and the Army have not yet demonstrated that active remediation is impracticable or that institutional controls are the only means available to protect human health. The institutional controls anticipated by DOE and the Army include deed restrictions prohibiting residential or agricultural use of groundwater. Drilling for mineral, water, or other purposes would also be prohibited. Without first exhausting all practicable active measures, it is inappropriate for the DOE and the Army to attempt to shift to innocent parties (including private landowners) the burden of preventing exposures to contamination and the cost of damaged natural resources.

- **Point of compliance**. EPA guidance states, for groundwater, remediation levels should be attained throughout the contaminated plume, or at and beyond the edge of the waste management area. DOE and the Army instead propose that Burgermeister Spring (approximately 1 mile north of the WSCP and WSTA) be the point of compliance for the demonstrating attainment of groundwater cleanup standards.

- **The risk from multiple contaminants is ignored.** CERCLA requires that "where the aggregate risk of [multiple] contaminants based on existing ARARs exceeds 10^{-4} or where remediation goals are not determined by ARARs, EPA uses 10^{-6} as a point of departure for establishing preliminary remediation goals." DOE and the Army have calculated Preliminary Remediation Goals (PRGs) based on risk from individual contaminants. They have not yet demonstrated that the aggregate risk of multiple contaminants based on existing ARARs does not exceed 10^{-4}. If the aggregate risk exceeds 10^{-4}, the PRGs should be recalculated to comply with 10^{-6} point of departure.

- **Reasonable maximum exposure scenario**. The risk-based Preliminary Remediation Goals (PRGs) are correctly based on 10^{-6} risk of excess cancers as the point of departure. However, the reasonable maximum exposure (RME) scenario is incorrectly determined to be recreational instead of residential. The proposed PRGs based on the *recreational visitor* exposure scenario are approximately 100 times the values for the residential scenario. DOE and the Army justify their "belief" in the recreational visitor scenario by ignoring the surrounding properties ("It is unlikely that the shallow aquifer *beneath the WSCP and the WSOW* would be used by a future resident." FS, p. 1-20, emphasis added.) or by appealing to unspecified "county zoning requirements for future housing developments" and a limited sample of municipal building permits and new well construction.

  Well logs provided to DOE and the Army show that several domestic wells in the area are open to the upper, weathered portion of the Burlington-Keokuk Limestone. Domestic use of the groundwater at this level has existed, does currently exist, and can be expected to continue. While DOE and the Army state they are aware of only one off-site private drinking water well shown to contain elevated levels of site-related contaminants and that the problem was resolved by installing municipal water lines to Twin Island lakes, the possibility of contamination of groundwater that could potentially be used for domestic drinking water is not as remote as the reader is led to believe.

- **DOE and the Army continue to misrepresent the position of the State of Missouri.** The FS (at p. 1-8) contains the following quote of Mimi Garstang, Deputy Director, Division of Geology and Land Survey: "Although some voids occur in the uppermost bedrock, they are generally

isolated and display limited vertical or lateral continuity." We have repeatedly stated that Ms. Garstang made this statement in regard to collapse potential for the disposal cell. She did not, as the FS implies, suggest that voiding could not provide a significant pathway for contaminant migration. DOE and the Army response to our comments is "Comment noted," but they have as yet failed to put Ms. Garstang's statement in the proper context. This along with DOE's and the Army's taking credit for natural attenuation without adhering to the applicable technical protocols casts doubt on the entire analysis in the FS.

The evaluation of remedial alternatives described in the Feasibility Study does not contain enough information to select one alternative as the preferred alternative. Remedial alternatives that are protective of human health do not survive even preliminary screening, but alternatives that are not protective are analyzed in detail. The minor revisions to the FS do not change our opinion that the evaluation contained in the draft final FS is superficial and seems merely an attempt to justify an alternative preferred by DOE and the Army without regard for the merits.

We look forward to working with you to resolve these issues. Please me at the MDNR Weldon Spring Field Office (314-441-8030) if you have any questions about our comments.

Sincerely,

HAZARDOUS WASTE PROGRAM

Glenn A. Carlson, P.E.
Program Manager

Attachment

cc: Weldon Spring Citizens Commission
Joe R. Nichols, St. Charles County Water Department
Dan Wall, EPA Region VII
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