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April 21, 2017

Mr. Don Dicks, Project Manager
Permits Section
Hazardous Waste Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102-0176

SUBJECT: Response to Department of Health and Senior Services review of the document *Technical Memorandum: Proposed Cleanup Levels for On-Site Areas of the Bannister Federal Complex, March 2017*

Dear Mr. Dicks:

In the attached table, ToxStrategies provides responses to the comments regarding the Technical Memorandum referenced above and transmitted by Jonathan Garoutte in a letter to you dated April 13, 2017. The Technical Memorandum will be updated as indicated by the responses in the attached table.

We appreciate the time and effort that has gone into reviewing this document. As indicated in an e-mail from Rich Nussbaum dated April 18, 2017, with incorporation of these responses into the Technical Memorandum, the document will be ready to be issued as a Draft Final for public comment.

Please let us know if you have any questions.

Sincerely,

Ann H. Verwiel
Managing Health Scientist

Attachment

cc: Mr. Bob Aston, Project Manager, U.S. EPA Region 7 (via e-mail)
Mr. Harvey Cohen, Ph.D., P.G., S.S. Papadopulos & Associates, Incorporated (via e-mail)
Mr. Kevin Breslin, Richmond Breslin, LLP
Ms. Sybil Chandler, National Nuclear Security Administration (via e-mail)
Mr. Rich Nussbaum, Permits Section, Missouri Department of Natural Resources (via e-mail)
Mr. James Cross, CenterPoint Development (via e-mail)

Bannister Federal Complex —ToxStrategies Technical Memorandum, Proposed Cleanup Levels for On-Site Areas of the Bannister Federal Complex
Bannister Federal Complex (March 2017)

CenterPoint's Response to Comments from
The Missouri Department of Health and Senior Services
(Received in letter from Jonathon Garoutte, MDHSS, to MDNR, April 13, 2017)

Comment	Response
General Comments	
The revised TM states that "although quantitatively included as part of the risk evaluation, metals, except for hexavalent chromium, are not considered chemicals of concern (COCs) for the purpose of developing cleanup goals…". The TM further states that "no metals identified as chemicals of potential concern (COPCs), other than hexavalent chromium, have been demonstrated to be potentially associated with historical site operations" (Section 8, Final Proposed Cleanup Goals). During an April 10 conference call, DNR assured DHSS that they concur with the conclusion reached by ToxStrategies. Given this assurance by DNR, DHSS no longer considers metals as part of our assessment of additive neurological toxicological endpoint concerns for purposes of deriving remediation goals (RGs).	Comment noted.

Comment	Response
Therefore, according to the list of contaminants we provided to DNR during a meeting on March 28, that contribute to neurological risk, tetrachloroethylene (PCE) and Aroclor 1254 are the only remaining contaminants that we have identified to be release-related. Of these, PCE contributes significant risk in groundwater for the central area (identified as the Central Plume in the BRA), but no soil samples identified non-cancer risk above 0.1. Aroclor-1254 was not identified in groundwater, and the hazard index's (HI's) in soil appear to be below an HI of 0.1. According to the TM, both Aroclor 1254 and PCE remediation goals for soil, protective of groundwater, are being reduced to a HI of 0.5 (per Table 19, Final Proposed Cleanup Goals for Chemicals of Concern in Soil and Groundwater). This should address any issues for potential soil additivity of risk for these two chemicals. As for PCE in groundwater, the RG is being reduced to a HI of 0.1 for liver effects. Consequently, this also addresses neurological endpoint concerns.	Table 18 of the technical memorandum (TM) indicates that proposed cleanup goals for PCE and Aroclor 1254 will be based on a default hazard index of 0.1 for potential exposure by construction workers and trench/utility workers. Table 18 provides site-specific cleanup goals as alternatives, but the default cleanup goals are used in the Corrective Measures Report (CMR).
Specific Comments	
1. The Executive Summary, page 9, second paragraph, first bullet point infers that the baseline risk assessment (BRA) screened contaminants at a hazard index (HI) of 1.0. For clarification, the BRA utilized an HI of 0.1 for screening COPC.	The reference in the text to the HI will be changed to 0.1. The TM and BRA used the same criterion of 0.1 when screening chemicals of potential concern (COPCs).
2. Section 2.3, Cleanup Level Development, page 18, paragraph 2 states that the utility worker was assessed using a "Hot Spot Assessment," limiting the evaluation to carcinogenic risk. For clarification, both carcinogenic and non-carcinogenic risks were evaluated.	The sentence in Section 2.3 is not intended to limit the evaluation to cancer risk evaluations. The second part of the sentence references both cancer risk and noncancer thresholds. To make the text clearer, the word "risk" will be removed from the phrase "sample-by-sample ~~risk~~ estimates."

Comment	Response
3. Section 3.1, Available Environmental Data, page 19, paragraph 3 discusses data used for groundwater assessment. Can the paragraph include a statement on how many and possibly which wells were sampled as part of the due diligence sampling effort? The purpose of this question is to ensure whether most, preferably all, of the monitoring wells will be represented in the data bases.	The groundwater monitoring wells included in the evaluation, and the corresponding data, were provided in Appendix E of the report. Samples from 75 wells sampled between 2012 and 2014 as part of the groundwater monitoring program (used in the BRA) and samples from 30 shallow groundwater wells sampled during due diligence efforts were included in the TM. The specific number of wells and a reference to Appendix E will be included in the text in this section.
4. Section 3.2, COPCs in Soil, page 20, first paragraph states that due diligence data was not available at the time of the screening level risk assessment (SLRA). Is this supposed to be the SLRA or BRA?	The due diligence data were not available for either report. BRA will be added to this statement in the text.
5. Section 7.1.2, Background Metals from Final BRA, page 36, first paragraph references background data from the BRA as Table 13. DHSS could not find that table. Please verify the reference.	Table 13 in the TM provides the background metals concentrations. The statement in the text has been revised to reduce confusion.
6. Section 7.4, Groundwater Evaluation, page 41 provides a summary of risk results using individual monitoring well results, which is not consistent with the BRA.	The TM and BRA were intentionally different on the approach for using data from the site. The TM looked at the data individually to identify areas where remedial activities would be proposed. The BRA looked at large areas of the site collectively, which did not provide the practical information necessary to design a remedial approach.
7. Section 8.2.2, Development of Proposed Site-Specific Cleanup Goals, page 45 pertaining to how the adjusted RGs were devised is confusing. Specifically, when assessing soil RGs at eighty percent (80%) and groundwater RGs at twenty percent (20%) is not included in U.S. Environmental Protection Agency (EPA) guidance. Please clarify how these percentages were calculated.	As described in the text, total risk or hazard index should not exceed the target level (e.g., hazard index of 1 for non-carcinogens). If two media are contributing to the hazard index, those contributions each could account for 50% of the total, or alternatively, 20% and 80% of the total. While 50% may seem more common, it is no less arbitrary than using 20%/80% or any other combination that sums to 100%. In all cases, the end result of the cumulative hazard index across media is the same HI of 1.

Comment	Response
8. Table 18, Proposed Cleanup Goals for chemicals of Concern in Soil and Groundwater Based on Potential Non-Cancer Hazard Index, does not include chlorobenzene in groundwater; a contaminant identified to have additivity for liver toxicological effects. Like the other contaminants having liver endpoint in this table, this contaminant's groundwater RG should be considered for reduction of the HI to 0.1. The well KC87-67-U has detects of 1,070 ug/L in 2013, 2,120 ug/L in 2014, and 2,500 ug/L in 2015. The risks for the construction worker are a HI of 2.2, 4.3, and 5.0, respectively. According to the 2016 annual sampling report, chlorobenzene levels ranged from 1,720 µg/L to 3,360 µg/L. Given these results, and based upon the well-by-well and sample-by-sample remedial assessment approach used for this site, DHSS recommends considering adding chlorobenzene to the list, and reducing the groundwater RGs to a HI of 0.1	Table 18 includes chlorobenzene, and the default cleanup goal is based on an HI of 0.1.
9. Table 18 does not address additivity for vapor intrusion (VI). The inclusion of sub slab depressurization systems (SSDSs) does marginalize the need to account for additivity. Yet not accounting for additivity does not provide groundwater RGs that identify when the need to maintain the SSDSs concludes. It is therefore recommended that the RGs for VI be discussed.	It should be noted that the cleanup goals for soil and groundwater are applicable to outdoor workers who are assumed to spend 100% of their time outdoors and would not be exposed to indoor air. Regardless, a few sentences will be added to discuss VI, the plan for SSDSs, and the considerations when systems may be removed. Therefore, exposure associated with VI would not be additive with exposures for these outdoor receptors.