Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

September 23, 2019

Mr. Justin Barker, Project Manager
Superfund Division
United States Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

RE: Review of Remedial Investigation / Feasibility Study Work Plan Site Wide Groundwater and Associated Documents, West Lake Landfill Operable Unit 3, Bridgeton Missouri, dated June 5, 2019

Dear Mr. Barker:

The Missouri Department of Natural Resources' (Department) Federal Facilities Section in coordination with the Department's Waste Management Program, and Missouri Geological Survey has reviewed the above referenced document and associated materials. Associated materials reviewed include the Responsible Parties' draft Field Sampling Plan, dated June 5, 2019, and Quality Assurance Project Plan, dated June 5, 2019.

Overall, the work plan documents are vague and do not clearly tie information together for adequate comparison to the requirements of Consent Order CERCLA-07-2018-0259. General comments have been provided for comprehensive improvement of the document. In addition, an attempt was made to provide specific comments in order to support general comments and expedite development of an approvable work plan.

It is understood that one of the goals of OU-3 is to create efficiencies between this investigation and groundwater monitoring requirements and actions related to OU-1 and OU-2 records of decision. There is no clear pathway described in this work plan for how this goal will be attained.

Thank you for giving us the opportunity to review and provide feedback on this material. If you have any questions or need further clarification, please contact me by phone at (573) 751-8628, or by written correspondence at P.O. Box 176, Jefferson City, MO 65102.

Sincerely,

ENVIRONMENTAL REMEDIATION PROGRAM

Ryan Seabaugh, P.E.
Federal Facilities Section

RS:rl

c: Ms. Christine Jump, Remedial Project Manager, EPA Region 7 (Email)
Mr. Tom Mahler, Remedial Project Manager, EPA Region 7 (Email)
Mr. Chris Nagel, Director, Waste Management Program (Email)

DRAFT COMMENTS ON VOLUME 1 REMEDIAL INVESTIGATION / FEASIBILITY STUDY WORK PLAN SITE WIDE GROUNDWATER (OPERABLE UNIT 03) West Lake Landfill Site, Bridgeton Missouri, June 5, 2019.

General

1. Overall, the Work Plan document is vague and does not clearly tie into data needs or the accompanying FSP/QAPP. Earlier sections of the work plan do not provide a clear basis or direction for later sections of the plan or accompanying documents, and later sections of the work plan do not have sufficient detail to evaluate whether the FSP and QAPP can provide sufficient data quality and investigative information to proceed past "Phase 1".

   Comment: Tie the sections and information together to develop a cohesive plan that can clearly show compliance with scope of work requirements and meet data objectives.

Introduction

2. Introduction, page 1-1: "*Operable Unit 2 (OU-2) has no known areas identified as having been impacted with RIM and includes the closed construction and demolition (C&D) cell, inactive sanitary landfill, and the North and South Quarry portions of the Bridgeton Landfill.*"

   Comment: Here and throughout the document when describing Operable Units in Superfund terms, use and capitalize the designated area names. For OU-2, according to the 2008 Record of Decision, the names are "Inactive Sanitary Landfill", "Closed Demolition Landfill", and "Former Active Sanitary Landfill". This should reduce confusion when discussing areas in solid waste permit terms. For example, the "Closed Demolition Landfill" Superfund term is not reflective of Department permit actions as this landfill has not received official closure. The Department recognizes that a closure inspection has been conducted; however, the closure process was placed on hold during further development of the OU-2 Remedial Design.

Section 1

3. Section 1.2. Required Contents of the Report, page 1-3: "*The following items were prepared, or will be prepared, as part of this effort: Develop understanding and presentation of current and future risk posed by contaminants to human health;*"

   Comment: Indicate why the risk assessment doesn't include the environment.

Section 2:

4. General Section 2: There is significant narrative in this section and there is no clear or consistent pattern to what details are included/excluded and why. Additionally, it is not clear in some places whether conclusionary statements are simply being referenced or if Trihydro is

separately validating previous conclusions. Some examples are provided in subsequent comments below.

Comment: Please provide clear, concise, and consistent information that can be related to OU3 and subsequent work plan activities.

5. Section 2.2. Site History, page 2-3: "*The landfill was not officially permitted for use as a sanitary landfill until 1952.*"

   Comment: There is a potential to confuse this as state permitting, replace "permitted" with "authorized by the county" consistent with a similar statement in the first paragraph of section 2.2.1.

6. Section 2.2.1. Landfill Permit History, page 2-4: *"In 1974, MDNR identified six waste disposal areas, four of which were subsequently permitted for waste disposal and two of which (the majority of Area 1 and the majority of Area 2) were not so permitted and were therefore closed in 1974 (H&A 2005). The areas subsequently permitted by MDNR for waste disposal are referred to as the 'regulated landfill.' These areas are discussed further below."* It is uncertain if the paragraph is referring to CERCLA OU-1 radiological Areas 1 and 2, or referring to areas 1 and 2 of Solid Waste Permit No. 218903. If referring to Permit Number 218903, areas 2 and 4 were denied a permit and areas 1, 3, 5, and 6 were permitted.

   Comment: Clarify the statement so "area" designations can be clearly understood. See also Comment #2

7. Section 2.2.2. West Lake Landfill Radiological Area 1, page 2-5: "*Pursuant to a Materials Management Plan (EMSI, 2006) approved by MDNR, inert fill material (e.g., clean materials as defined in 10 CSR 80-2.010(11), such as uncontaminated soil, concrete, asphaltic concrete, brick, or inert solids) was placed over portions of Area 1 between 2006 and 2008.*"

   Comment 7-1: Clarify statement to indicate if this statement is a citation from a report or a conclusion by Trihydro.

   Comment 7-2: This statement has been found and commented on in prior remedial documents submitted by the responsible parties, however I was unable to confirm that placement of inert materials was executed pursuant to the Materials Management Plan. I did however find evidence that the state communicated serious concerns with the work being executed relative to the final plan. Work in OU-1 also needs approval from EPA, and evidence has not yet been provided indicating that approval had been granted. Please replace the statement throughout the work plan with one that appears less misleading, or delete since the relevance of the statement to OU3 is not apparent or stated.

8. Section 2.2.4. Inactive and Closed Demolition Landfill Operations in OU-2, page 2-7: *"Some industrial wastes may also have been disposed in this area, but based on the visual inspection and geologic logging of drill cuttings and core samples, industrial wastes do not appear to have been a major portion of the wastes disposed in the Inactive Sanitary Landfill."*

Comment 8-1: Describe how many core and cutting samples from the Inactive Landfill were available for inspection, how many boreholes from the Inactive landfill were inspected, and where they are located.

Comment 8-2: Describe how many core and cutting samples from the Closed Demolition were available for inspection, how many boreholes from the Demo landfill were inspected, and where they are located.

Comment 8-3: Describe or cite activities that were conducted to confirm "appearances."

9. Section 2.2.4. Inactive and Closed Demolition Landfill Operations, page 2-7: *"Based on prior reports and the results of drilling and sampling, only C&D debris and wastes are expected to have been disposed of in the Closed Demolition Landfill."*

   Comment: Cite the reports confirming only C&D debris and wastes are present in the Closed Demolition Landfill.

10. Section 2.2.4. Inactive and Closed Demolition Landfill Operations in OU-2, page 2-7: *"However, review of the permit history indicates that sanitary wastes may have been placed in this area pursuant to Permit No. 218903 prior to placement of overlying C&D debris and wastes authorized under permit 218912 issued on January 27, 1976."*

    Comments: Areas 1 and 5 of Permit No. 218903 were permitted for demolition waste. Please correct the statement.

11. Section 2.2.4. Inactive and Closed Demolition Landfill, page 2-8: The third paragraph describes review of aerial photographic analysis, but does not provide a reference.

    Comment: When providing interpretations based on aerial photographs, refer to Appendix A, October 1989 and 1991 Aerial Photographic Analysis or other appropriate reference.

12. Section 2.2.5. Bridgeton Landfill, page 2-8: *"A subsurface reaction (SSR) began in 2010..."*

    Comment: If evidence is not available definitively supporting the timing of the start of the reaction, replace "began" with "discovered" or similar.

13. Section 2.2.6. Buffer Zone and Lot 2A2, page 2-10: *"The presence of radionuclides on these properties has been interpreted to be the result of historical erosion of impacted soil from Area 2."*

    Comment: Clarify who made this interpretation.

14. Section 2.3. Land Use Restrictions, page 2-11: *"In particular, the proximity of the airport to the landfill presents a risk of bird strikes. Certain types of scavenging birds (e.g., gulls, crows) are attracted to exposed putrescible wastes at landfills, and accordingly can present a bird strike risk to passing aircraft. Similarly, bird flocks also pose a serious risk to aircraft from the potential of being sucked into the jet engines of commercial aircraft, thereby causing complete engine failure."*

    Comment: Clarify how this statement is relevant to a groundwater investigation or delete.

15. Section 2.4. History of Investigative, Regulatory, and Response Actions, 2-12: *"A summary of the pertinent groundwater-specific OU-1, OU-2, and regional groundwater investigations is presented below. These reports have been used to develop the conceptual Site model (CSM)."* There appears to be detailed narrative provided in Section 2 prior to this subsection that have not been incorporated by this statement.

    Comment: Indicate whether components of previous subsections are being incorporated into the CSM. Any component that does not contribute to the CSM or support investigation planning should be deleted.

16. Section 2.4.2. 1989 Site Characterization and remedial Action Concepts, 2-14: *"The investigation also concluded that radioactive material, as it then existed, did not pose an immediate health hazard. However, it also identified that there was a long-term potential for the radioactive material to pose a health problem without the proper construction of a soil cap."*

    This statement appears out of context and misleading. The text of Section 5 of the 1989 UMC report states: *"The radioactive material as it presently exists does not pose an immediate health hazard for individuals living or working in the area of the landfill. However, there is a long-term potential for the radioactive material to pose a health problems. Therefore, this section discusses six possible courses of action, of which all but A [no action] and D [excavation and relocation] are considered temporary. Option A, in which no remedial action is proposed, is unacceptable because the concentrations of radionuclides in the landfill will become too high; Option A is described for comparison purposes only."*

    Comment: Delete "without the proper construction of a soil cap"

17. Section 2.4.6. 1997 West Lake Landfill OU-2 RI/FS Site Characterization Summary Report, page 2-16: *"Groundwater quality data also confirmed the inward gradient created by the leachate collection system in the Bridgeton Landfill. Surface water and sediment quality was deemed free of impacts from OU-2."*

    Comment: Clarify in the statement whether this is a citation or the author of this work plan, Trihydro, is confirming and deeming.

18. Section 2.4.9. 2006 OU-2 Feasibility Study, page 2-18: *"The presumptive remedy of containment for CERCLA municipal landfill sites was outlined and approved in the OU-2 AOC and discussed in the EPA approved Remedial Action Objectives Report. An MDNR prescribed landfill cover with long-term monitoring and institutional controls was proposed as the final remedy for OU-2, but design was postponed until a decision was made for OU-1 so the final remedies could be coordinated."* It is not clear how this is relevant to a groundwater investigation. In addition, the OU-2 ROD was signed in 2008 which provides the actual decision.

    Comment: Delete.

19. Section 2.4.10. 2006 OU-1 Feasibility Study, page 2-18: Extraneous

    Comment: Delete the paragraph after the first sentence.

20. Section 2.4.11. 2008 OU-1 Record of Decision, page 2-19: *"The public comment period was open for over six months in 2006 and reopened for approximately 2 weeks in 2008."* Extraneous.

    Comment: Delete the sentence.

21. Section 2.4.12. 2008 OU-2 Record of Decision, page 2-19: *"The Bridgeton Landfill has been pumping approximately 300 million gallons of leachate/groundwater per year since approximately1993 and will continue with said pumping through at least 2036. Groundwater and surface water analytical results from the OU-1 and OU-2 RI/FS projects combined indicated the constituents detected at the Site in excess of MCLs were chlorobenzene, benzene, dissolved and total lead, dissolved and total arsenic, and dissolved and total radium. The results generally showed sporadic and isolated detections of a small number of contaminants at relatively low concentration levels. These results were not necessarily indicative of on-Site contaminant plumes, radial migration, or other forms of contiguous groundwater contamination attributable to the landfill units."* It is not clear whether the author is making this statement or quoting from the 2008 OU-2 Record of Decision.

    Comment: Clarify or delete.

22. Section 2.4.14. 2012 to 2014 Groundwater Monitoring Reports, page 2-20: Entire paragraph. This description contains a number of conclusions and provides no clarity as to who is making the conclusion. For example, *"The results of the July 2012 sampling event support the EPAs May 2008 ROD conclusion: namely, isolated and sporadic detections of a small number of radiological and conventional contaminants exist in Site groundwater, but no contiguous plumes of radiological or conventional groundwater contaminants are present underneath the Site or migrating from the Site."*

    Comment: Clarify or delete.

23. Section 2.4.18. 2018 Updated Baseline Risk Assessment, page 2-24:

    Comment: Add "OU-1" to the section description.

24. Section 2.4.18 2018 Updated Baseline Risk Assessment: Extraneous information –*"Further evaluation of the COCs in the BRA indicated: There are no unacceptable LCRs or non-cancer effects to on-property or off-property human receptors under current conditions; For scenarios 1,000 years in the future, LCRs and non-cancer effects to landfill workers that access the surface of the landfill and some off-property receptors exceed regulatory thresholds. The future risks were determined by assuming that the landfill will not have a cover and no remediation will occur."*

    Comment: Delete

25. Section 2.4.19. 2018 OU-1 Final Feasibility Study, page 2-24: Nearly the entire paragraph is extraneous

    Comment: Delete the paragraph after the first sentence.

26. Section 2.4.20. 2018 OU-1 Record of Decision Amendment, page 2-25: Nearly the entire section is extraneous.

Comment: Delete all that is not relevant to the OU-3 work plan.

27. Section 2.4.20 2018. OU-1 Record of Decision Amendment, page 2-25: *"The EPAs Amended Remedy includes: Groundwater monitoring"*

    Comment: Add "performance" after Groundwater.

Section 3

28. Section 3 General:

    Comment: There is significant discussion on available data, but there is a lack of specific discussion on data needs. For example the referenced Appendix R in this Section contains some graphs of leachate indicators and radium. Appendix R does not contain information on all leachate indicators or other contaminants of concern, which is not mentioned. None of the later sections provide any specific discussion on the limitations/gaps in previous studies either. After these limitations / gaps are identified, later sections of the work plan should describe how these gaps in knowledge will be filled.

29. Section 3.1.3.1. Bedrock, page 3-6: *"Bedrock surface elevations are included in Appendix F."*

    Comment: Add "of the Former Active Sanitary Landfill" after "elevations"

30. Section 3.1.3.1.5. Structural Features, page 3-10: Available information appears to suggest the possibility of vertical joints extending into the Warsaw formation.

    Comment: Provide more detail on features that might affect the CSM and warrant investigation, such as vertical jointing.

31. Section 3.1.3.1.5. Structural Features, page 3-10:

    Comment: Describe the number, size, and location of cavities in more detail.

32. Section 3.1.3.2. Unconsolidated Sediments and Materials, page 3-10: The referenced isopach map excludes Area 2 and does not analyze borings newer than 2005. It would be helpful if the work plan described these kinds of limitations to get a better understanding of what is missing in the CSM and what will be updated in the Remedial Investigation.

    Comment: While writing on what has been done, include details on what has not been done or what needs to be updated so it can be tied to work in the work plan.

33. Section 3.1.3.2.1. Alluvium, page 3-10: The location map for the Burns and McDonnel Cross Section A-A' in the referenced Appendices is missing.

    Comment: Include the location map and any additional cross sections from the referenced B&M report.

34. Section 3.1.3.2.1. Alluvium, page 3-10: Some cross sections in the referenced appendix E are cut off and unrecognizable

Comment: Provide the complete diagrams and cross sections.

35. 3.1.3.2.1. Alluvium, page 3-10: *"Alluvial cross sections and interpretations were updated during preparation of this Work Plan based on EPA guidance on environmental sequence stratigraphy to identify preferential flow and flux pathways."*

    Comment: In order to get a more complete picture of the perimeter profiles, include a cross sectional diagram for the eastern and southern boundaries of the site. If insufficient information is available to produce the profiles, indicate data needs in the work plan.

36. Section 3.1.3.2.1. Alluvium, page 3-10: *"Alluvial cross sections and interpretations were updated during preparation of this Work Plan based on EPA guidance on environmental sequence stratigraphy to identify preferential flow and flux pathways."*

    Comment: Reference the wells being used to generate the cross sections on the location map so distance between the cut and the well can be easily interpreted.

37. Section 3.1.3.2.4. Solid Waste and Landfill Liner, page 3-12: *"Solid waste is present above the alluvium west of the alluvial divide and in the North and South Quarry Pits of the Bridgeton Landfill. Solid waste was well characterized in the OU-1 RIA and primarily..."*

    Comment: Explain how OU2 BSLF was well characterized in the OU1 Remedial Investigation.

38. Section 3.1.3.2.4. Solid Waste and Landfill Liner, page 3-12: *"A layer of compacted clay was placed beneath the Inactive Sanitary Landfill as a liner to prevent downward movement of leachate."*

    Comment: The Inactive Sanitary Landfill has pre-state law portions and post-state law portions. Indicate whether the entire landfill is lined or limited to specific sections/permits.

39. Section 3.1.4. Local Hydrology and Climate, page 3-13: *"Beyond the covered Bridgeton Landfill, the only water available to leach through refuse is precipitation."* It is unclear what this statement is trying to convey, so accuracy cannot be determined.

    Comment: Clarify the statement.

40. Section 3.1.4. Local Hydrology and Climate, page 3-13: *"Approximately half of the approximately 34 inches of precipitation that falls annually in the level northern portion of the landfill beyond the covered Bridgeton Landfill is estimated to infiltrate."*

    Comment: Explain how this estimate was made. (Note: Other portions of the work plan describe 40 inches average annual precipitation in the area.)

41. Section 3.1.5. Local Hydrogeology, page 3-14: *"(up to 60 feet thick based on logging at nearby private well 005322, located approximately one mile southwest of the site)"*

    Comment: Review this statement for accuracy and revise accordingly.

42. Section 3.1.5.2. Aquifer Testing, page 3-16:

Comment: Explain why pump testing is not being proposed, or provide more information on pump testing in the work plan and procedures in appropriate documents.

43. Section 3.1.5.3.2. Hydraulic Gradients, page 3-19: *"The average Missouri river stage is approximately 430 feet msl (2000 to present), and depending on the year and season, the river stage can fluctuate by as much as 10 vertical feet."*

    Comment: Provide the location or station.

44. Section 3.1.5.3.2. Hydraulic Gradients, page 3-20: *"Monthly measurements appear to have been adequately spaced to detect significant changes in water table elevations. Therefore, monthly water level gauging will be conducted during implementation of this RI/FS. Contour patterns"* This is the only statement found in Section three that describes specific planned work activity for the RI.

    Comment: Move specific plans to Section 5.

45. Section 3.1.5.7.2. Leachate Collection System, page 3-24: *"The current monthly amount of leachate generated during 2018 ranged from 1.8 to 3.3 million gallons (approximately 60,000 to 110,000 gpd)."*

    Comment: Cite the data source, and explain the origin of the leachate in relation to the leachate collection system (i.e. what portions of the leachate collection system are currently operational.)

Section 4

46. Section 4.1.1.4. Define the Boundaries of the Study, page 4-4: *"The vertical extent of the study includes the Missouri River alluvium, the St. Louis Formation, and the Salem Formation."* Portions of the Site reach the Warsaw Formation and vertical joints reaching the Warsaw have been documented.

    Comment: The study should at minimum, include investigation of the Warsaw for preferential pathways, plume delineation, and modeling accuracy.

47. Section 4.1.2. Develop the Analytic Approach (Decision Rules), page 4-4: *"Groundwater-surface water interactions will be considered complete if horizontal and vertical hydraulic gradients are characterized near surface water bodies."* The meaning of this statement is unclear. Groundwater-Surface interactions should not be considered complete until surface/groundwater communication and area pumping (example leachate pumping) effects are well understood and can be modeled with accuracy.

    Comment: Create decision rules that can meet requirements in the scope of work.

48. Section 4.1.2. Develop the Analytic Approach (Decision Rules), page 4-5: *"The need for vapor intrusion studies will be evaluated once the nature and extent of impacts have been defined and receptors have been identified."* With personnel working and offices on site/property, the need should already be established to perform some level of vapor intrusion studies.

    Comment: Include performance of vapor intrusion studies.

Section 5

49. Section 5.3.1. Preliminary Monitoring Well Inventory, page 5-4: The referenced Appendix X appears to be Appendix W.

    Comment: Review and modify references as needed.

50. Section 5.3.2. Proposed Monitoring Well Designations, page 5-5: *"No Keokuk Formation monitoring wells are proposed during Phase I Site characterization. Four Keokuk Formation monitoring wells surrounding the South Quarry portion of the Bridgeton Landfill are part of the current MDNR groundwater monitoring program and impacts do not appear to have migrated through the Warsaw Formation aquitard."* Part of investigations should include activities that confirm "appearances"

    Comment 50-1: Include preliminary investigations of Keokuk and Warsaw Formations.

51. Section 5.3.3. Proposed On-Site / Near-Site Monitoring Well Locations and Rationale, page 5-6: *"Combined total radium-226 and radium-228 are considered drivers for the OU-3 Site investigation."*

    Comment: Explain why combined total radium is considered the driver, and what parameters were used to base this decision.

52. Section 5.4.4. Well inventory and Well Repair, page 5-12: *"Recommendations for well redevelopment, repair, replacement, or abandonment will be provided in the Well Inventory Summary Report."* What criteria will be used to determine the need for well redevelopment, repair, replacement or abandonment? How will data be handled if samples are found to be taken from damaged wells?

    Comment: Include or reference the appropriate location in other documents that detail how procedures will be done and how it will meet SOW requirements and data gaps identified in previous sections of the work plan.

53. Section 5.4.5. Borehole Advancement, page 5-12: *"The deepest borehole at each location will be continuous cored, logged by a field geologist, field screened, sampled, and logged using geophysical techniques."* The description of "geophysical techniques" is too vague and does not provide adequate detail on how it will be implemented to meet objectives required by the statement of work.

    Comment: Include techniques to be used and how they will help meet SOW requirements and fill data gaps identified in previous section of the work plan. Include specific references to appropriate section of the SAP/QAPP.

54. Section 5.4.6. Continuous Coring and Field Logging, page 5-12: Entire Paragraph.

    Comment: Similar to previous comments, connect the activity to data needs and appropriate SAP/QAPP references.

55. Section 5.4.13. Groundwater Monitoring, page 5-17: *"The groundwater monitoring program will be sufficiently robust to measure for radiological and non-radiological constituents that have historically been detected at the Site"* The groundwater monitoring program as stated appears to be restricted. The statement should be consistent with the SOW and state that all OU1 and OU2 Contaminants of Concern will be monitored to sufficiently characterize all contaminants and assess risk.

    Comment: Expand the statement to include monitoring all Contaminants of Concern to sufficiently characterize contaminants and assess risk.

56. Section 5.4.13.1. Water Level Measurements, 5.4.14. Staff Gauge Installation, 5.4.15. Pressure Transducers: *"depth to static groundwater measurement will be collected at each groundwater monitoring well on a monthly basis, as well as prior to purging groundwater during sampling events. The monthly well gauging will be completed for a period of 24 consecutive months", "The newly installed gauges will be measured monthly, concurrent with the monthly water level gauging events so that interconnection of the surface water and groundwater can be evaluated."*, and *"After completing the initial round of water level measurements and groundwater sampling, absolute pressure transducers/data loggers (DLs) will be placed in 32 select wells."*

    Transducers and data loggers are capable of continuously recording water levels and reporting at intervals of up to fractions of a second. There is inadequate explanation and rationale for taking a snapshot of water levels once a month to understand groundwater / surface water interaction, and monthly intervals would not capture short-term events such as localized flooding and pumping activities. Additionally, the plan for monthly water level measurement does not appear to meet the requirements of the SOW or provide means for effective modeling.

    Comment: Include continuous water level monitoring in all wells and staff gauges.

57. Section 5.5. Fate and Transport, page 5-22: *"The mathematical groundwater model could be a simplified analytical solution or multi-dimensional numerical flow and transport model."* This statement does not appear to meet the requirements of the SOW.

    Comment: Include an appropriate modeling program to meet the requirements of the SOW.

58. Section 5.6. Vapor Intrusion Investigation, page 5-22: *"An assessment will be performed to determine the potential for completion of vapor intrusion pathways in on-Site or off-Site occupied structures."*

    Comment: Replace "or" with "and"

Section 7

59. Section 7.2.4. Nature and Extent of Contamination, page 7-3: *"Both natural chemical components and contaminants of some, but not necessarily all, of the following media will be discussed: sources, soil and vadose zone, groundwater, surface water, and air."* It is unclear what this statement is trying to communicate, so adequacy to SOW requirements cannot be assessed.

    Comment: Clarify the statement.

Tables, Figures and Appendices

60. Table 2-1. Site History Summary: It is not clear if groundwater data from DNR reports is being incorporated into development of the work plan. DNR has provided groundwater data to EPA that was obtained during the State's lawsuit with Bridgeton Landfill LLC. We have also communicated availability of the data if the PRPs are unable to provide the sample data and split sample results.

    Comment: Indicate whether state groundwater reports and data were incorporated into the available data set.

61. Table 3-6. Preliminary Identification of Potential Chemical-Specific ARARs: The chemical-specific ARAR table has not been reviewed for completeness. The table appears to be reduced from the original list that the State submitted to EPA from the OU-1 RIA/FFS, for example solid waste regulations (10 CSR 80.) An updated and more comprehensive list developed under an established process may be a more appropriate starting point.

    Comment: Consistent with OLEM Directive 9200.2-187, dated October 20 2017, we are prepared to assist EPA in developing a current preliminary list of chemical-specific ARARs/TBCs upon request.

62. Table 3-6. Preliminary Identification of Potential Chemical-Specific ARARS: The column for "preliminary determination" is speculative and provides limited use for the work plan.

    Comment: Replace the "Preliminary Determination" column with one that summarizes whether the potential ARAR generally contains data quality requirements, detection requirements, screening levels, and/or compliance limits for groundwater or soil vapor.

63. Table 3-6. Preliminary Identification of Potential Chemical-Specific ARARs: The column for "Remarks" and the column for "Discussion/Analysis" contains similar speculative determinations as the "Preliminary Determination" table.

    Comment: Replace the "Remarks" and "Discussion/Analysis" columns with one that points to appropriate WP/QAPP/FSP sections that respond to specific potential ARAR requirements.

64. Table 3-6. Preliminary Identification of Potential Chemical-Specific ARARs: Reference to Missouri Water Quality Standards, 10 C.S.R. 20-7.031(5) "Requirement:" It is not clear how the numbers were attained in this box. The standard refers to several tables. Numerous contaminants from the tables are missing from this list, and values do not represent the most conservative in a number of cases.

    Comment: Refer to the full citation/tables in the "Requirement Section" and justify constituent concentration in the QAPP.

65. Table 3-6. Preliminary Identification of Potential Chemical-Specific ARARs: The citation for the State's Public Drinking Water Contaminant Levels and Monitoring regulations has regulated contaminants that are missing from the "Requirement" column.

Comment: Include all regulated contaminants.

66. Table 3-6. Preliminary Identification of Potential Chemical-Specific ARARs:

    Comment: Include 10 CSR 80.3010 Appendices I, II, III and IV constituents in the list of potential chemical-specific ARARs.

67. Table 3-7. Preliminary Identification of Potential Action-Specific ARARs: The action-specific ARAR table has not been reviewed for completeness or accuracy. Determination of Action-specific ARARs, even if "preliminary" is speculative at the work plan stage.

    Comment: Replace the table or its columns with information useful for developing a remedial investigation work plan.

68. Table 3-7. Preliminary Identification of Potential Action-Specific ARARs:

    Comment: If the table is retained, include 10 CSR 80-3.010(9) Groundwater Monitoring until such time that it is definitively determined how implementation of the OU-2 ROD will coordinate or interact with OU-3 RI/FS.

69. Table 3-8. Preliminary Identification of Potential Location-Specific ARARs: The location-specific ARAR table has not been reviewed for completeness or accuracy. An updated and more comprehensive list developed under an established process may be a more appropriate starting point.

    Comment: Consistent with OLEM Directive 9200.2-187, dated October 20 2017, we are prepared to assist EPA in developing a current preliminary list of location-specific ARARs/TBCs upon request.

70. Table 3-8. Preliminary Identification of Potential Location-Specific ARARs:

    Comment: If the table is retained, Include 10 CSR 80-3.010(9) Groundwater Monitoring as a potential location-specific ARAR until such time as it is definitively determined how implementation of the OU-2 ROD will coordinate or interact with OU-3 RI/FS. For example, well spacing requirements of this regulation should be considered.

71. Figure 2-4. MDNR Permitted Areas: Final waste limit permit boundaries were surveyed and documented in the Waste Limits Investigation Summary Report, Revised July 2011 prepared by Aquaterra. Some of the waste boundaries provided in this figure appear to deviate from the approved boundary lines. For example, it appears the boundary for Permit No. 118912 presented in Figure 2-4 is the OU-2 ROD boundary and not the actual permit boundary as depicted in that report.

Comment: Compare polygons in this figure with the permit boundaries shown in the Waste Limits Investigation Summary Report, Revised July 2011 prepared by Aquaterra and revise as necessary.

72. Appendix X *"DRAFT Statistical Narrative for Sample Size Requirement Estimation:"* This draft document could not be reviewed due to the absence or erroneous reference to its purpose.

    Comment: Delete or provide adequate discussion and reference in appropriate documents.

COMMENTS ON VOLUME 2B QUALITY ASSURANCE PROJECT PLAN
SITE WIDE GROUNDWATER (OPERABLE UNIT 03)
West Lake Landfill Site, June 5, 2019

General

73. General: There is no detail on Quality Assurance for types of data other than groundwater samples for laboratory analysis.

    Comment: Include detail on Quality Assurance for all data that will be collected.

74. General: The QAPP is not sufficiently detailed to understand what the data quality objectives are, and if objectives are being met.

    Comment: Develop a QAPP sufficient to understand and agree that data quality will be sufficient to determine if objectives are being met and the plan can comply with the AOC and statement of work.

Section 1

75. Section 1.1.1. Roles and Responsibilities, page 1-4: "*Furthermore, the EPA Project Manager has the authority to inspect Trihydro's field methods; therefore, the Trihydro PM and APM will communicate the schedule of field events with the EPA PM. The Trihydro PM and APM will report directly to the EPA Project Manager and are responsible for technical QC and project oversight.*" Sections X, XI, and XII of the order provide the same or similar access for State personnel. As such, designated State personnel should also receive direct communication and reporting for these events in a timely manner.

    Comment: Revise the language to include similar communication and reporting for State oversite.

76. Section 1.2. Problem Definition and Description, page 1-8: "*Is the Site fully characterized in accordance with the work plan?*" Characterization should be in accordance with the AOC, Statement of Work, and the approved work plan.

    Comment: Cite the order, statement of work, and add "approved" prior to "work plan"

77. Section 1.2. Problem Definition and Description, page 1-8: "*Is there potential for workers, the public, or ecological receptors to be exposed to contaminants?*" This problem definition only describes the exposure portion of risk assessment requirements. The other portion, dose, may provide some further insight into sampling needs.

    Comment: Include problem definitions that fully incorporate needs of an adequate risk assessment.

78. Section 1.2. Problem Definition and Description, page 1-8: *"Is there evidence that any potential COCs are migrating outside of the target area?"* This problem definition appears to limit the scope of sampling and modeling to a target area which is undefined in this bullet.

    Comment: The problem definition should be modified or supplemented to address the need for collecting enough data to determine COC extent and accurately modeling contaminant movement.

79. Section 1.2. Problem Definition and Description, page 1-8: *"Is there evidence that any potential COCs are being remediated?"* It is unclear what this problem definition is suggesting. If the Responsible Parties want to determine past natural attenuation, it needs to be clearly detailed in the work plan/QAPP/SAP. If the PRPs want to determine if leachate pumping at the Former Active Landfill is performing site-wide remediation, it needs to be clearly detailed in the work plan/QAPP/SAP. If there is another purpose, it needs to be clearly detailed in the work plan/QAPP/SAP.

    Comment: Clarify or delete.

Section 2

80. Section 2.0. Data Quality Objectives: This section contains no actual Data Quality Objectives.

    Comment: Provide the data quality objectives in this QAPP in sufficient detail to assess the adequacy of the QAPP and Sampling Plan.

81. Section 2.1. Criteria for Measurement Data: In general, topics discussed under this subsection are too broad and do not adequately connect to specific criteria or processes to determine data quality using these measures. Some examples are provided in the comments below.

    Comment: Provide enough detailed information to develop or show actionable data and decision criteria.

82. Section 2.1. Criteria for Measurement Data: It is unclear why "decision rule" has been included in this list for data quality indicators. The decision rule covers what follow-on actions will be taken when the data quality indicators have or have not been met.

    Comment: Provide an appropriate relationship between data quality indicators and the decision rule or relocate to an appropriate location in the QAPP and FSP documents.

83. Section 2.1. Criteria for Measurement Data: The Data Quality Indicator for Bias was not included in the data criteria.

    Comment: Include the data quality indicator of Bias, and discuss specifically how it will apply to each type of analyses.

84. Section 2.1.4. Representativeness: The discussion on representativeness is too general and does not adequately explain the criteria for determination of representativeness.

Comment: Explain how field personnel will use the various information available to them, what attributes will be used to evaluate representativeness, what "corrective action" will be employed and how the process will be recorded and utilized in the investigation.

85. Section 2.1.6. Comparability: The discussion on comparability is too general and does not adequately explain how comparability will be measured among existing data or collected data. Additionally it does not discuss types of data subject to comparison, comparison criteria.

    Comment: Develop a QAPP that has site/data-specific information on how comparability will be quantified and types of decisions to be made on comparability issues.

86. Section 3.0. Data Quality Assessment: This section should be developed with enough site-specific detail to be able to agree on specific data quality assessment methods.

    Comment: Provide site/data-specific information.

COMMENTS ON VOLUME 2A REMEDIAL INVESTIGATION / FEASIBILITY STUDY
FIELD SAMPLING PLAN
SITE-WIDE GROUNDWATER (OPERABLE UNIT 03)
West Lake Landfill Site, June 5, 2019

Section 3

87. Section 3.2.1. Photoionization Detector, page 3-2: *"An aliquot of soil will be collected directly from the soil core and placed in a small ziploc-style bag. The bag will be filled half-full with soil and sealed."*

    Comment: Explain how and with what decision criteria the interval of the soil sample will be selected.

88. Section 3.2.1. Photoionization Detector, page 3-2: *"The PID results, in parts-per-million, will be recorded on field forms for each sample depth and location."*

    Comment: Explain what the data will be used for.

89. Section 3.2.2. Multi-Gas Meter, page 3-3: *"The instrument sounds an audible alarm when concentrations exceed preset limits."*

    Comment 89-1: Describe what the preset limits will be and for what purpose the Multi-Gas Meter will be used for.

    Comment 89-2: Include provisions for direct reporting of alarm occurrences and the reason for the alarm to regulating entities.

90. Section 3.2.3. MicroR Detector and Dual Phosphor Alpha Beta Scintillator:

    Comment: Explain the purpose of using these tools, and what the data will be used for.

91. Section 3.3. Site Reconnaissance, page 3-5: "*Respondents will request access agreements with AAA Trailers, Earth City, the City of Bridgeton, and Earth City Levee District for off-Site monitoring well locations.*" Access agreement requests should include all adjacent properties.

    Comment: Revise the statement to be less restrictive on access request locations and potential work.

92. Section 3.6.1. Drilling and Sampling Procedures, page 3-8: "*Boreholes will be continuous cored, logged by a field geologist, field screened, sampled, and logged using geophysical techniques.*"

    Comment: Provide specifics or refer to the appropriate document location on what geophysical techniques and instruments will be utilized as well as the purpose that each will be utilized for in this investigation.

93. Section 3.6.1. Drilling and Sampling Procedures, page 3-9: *"A minimum of four (4) soil samples from the alluvial deposits at each boring location will be sent to the laboratory for geotechnical testing."*

    Comment: Describe how the samples will be collected or prepared.

94. Section 3.6.1. Drilling and Sampling Procedures, page 3-9: *"A minimum of four (4) soil samples from the alluvial deposits at each boring location will be sent to the laboratory for geotechnical testing."*

    Comment: If the samples represent discrete borehole intervals, describe how the four sample intervals will be determined.

95. Section 3.6.3. Borehole Geophysical Logging, page 3-12: In addition to describing capabilities of available borehole geophysical techniques, the actual purpose of each technique for this investigation and how it will fit in to the RI report should be included.

    Comment: Include the purpose / expected usage for available borehole geophysical techniques as it applies to this investigation.

96. Section 3.7. Groundwater Sampling, page 3-23, second paragraph: The FSP should contain more than generalities of groundwater a monitoring program.

    Comment: Provide a field sampling plan with enough detail suitable for implementing sampling activities.

97. 3.7.1. Water Level Measurements, page 2-23: *"Depth to static groundwater will be measured monthly, within a 48-hour timeframe, at each groundwater monitoring well in the network for a period of 24 consecutive months, as well as prior to purging for groundwater sampling events, as per the fluid level measurement SOPs included in Appendix A."* Depth to groundwater should be measured continuously. Any additional measurements during sampling activities should be supplemental.

    Comment: Provide detail for continuous groundwater measurement.