



Missouri Department of dnr.mo.gov

NATURAL RESOURCES

Michael L. Parson, Governor

Carol S. Comer, Director

July 22, 2020

Ms. Christine Jump, Project Manager
Superfund Division
United States Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

RE: Emergency review of the second draft OU-1 Design Investigation Work Plan and associated documents, West Lake Landfill Operable Unit 1, Bridgeton Missouri, dated June 2020

Dear Christine Jump:

The Missouri Department of Natural Resources' (Department) Federal Facilities Section has performed the requested review of the above referenced documents. EPA requested an expedited review of the second draft quality assurance project plan (QAPP) and field sampling plan (FSP) with focus on topics that are specific to drilling and sampling. The expedited review was requested in order to meet the responsible parties' ultimatum to approve all documents by June 19, 2020.

Based on the concise review of the above referenced QAPP and FSP, we continue to have the same or similar questions that were identified in the previous submittal due to the lack of transparency and lack of defensible decision criteria. The attached comments should be considered supplemental to the Department's comments on the first draft documents.

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: Mr. Tom Mahler, Remedial Project Manager, EPA Region 7 (email)

Comments on draft design investigation Quality Assurance Project Plan (QAPP) and Field Sampling Plan (FSP) dated June 2020

Geostatistical Model Comments:

General Comment:

1. Many of the proposed borings in the DIWP rely on a geostatistical model that is not understood, reproducible, or approved. Because the DIWP does not effectively address the comments provided on the PEP or Draft DIWP and has not further developed the model for use in a Remedial Design, we are unable to confirm if the proposed boring locations or proposed monitoring and sampling will accomplish the objectives of the investigation. There is little doubt that collection and analysis of the proposed samples and monitoring information will help any geostatistical model. There does appear to be good spatial distribution (horizontal and vertical) of sampling locations located within Area 1 and Area 2. Therefore, we see the value in mobilizing as soon as possible to allow time for additional field investigations, as needed, to strengthen the model once it is understood and the modeling methodology is approved.

Specific Comments:

2. Appendix E, Section 1.3.1, page E-4: *“Existing hard data has high data density at concentrations below 7.9 pCi/g, but between 7.9 and 10,000 pCi/g there is insufficient data density because laboratory analytical samples were typically sampled from the highest core gamma scan intervals in previous investigations. This reduced the quantity of samples in this range because higher activity samples were typically selected. These ranges will be targeted for sample collection in the field using related gamma counts to improve quantified relationships of radium and thorium.”*

and

Appendix E, Section 1.3.3, Page E-4 and E-5: “Areas in the mid-range of the regression, where data gaps or insufficient line fit is observed, will be targeted during the DI data collection process. Specific areas targeted for increased data collection include thorium-specific data collection in the gamma count target range of 40,000 to 300,000 counts per minute (cpm) (approximately 250 to 10,000 pCi/g combined thorium), and radium-specific data collection in the gamma count target range of 40,000 to 500,000 cpm (approximately 100 – 1000 pCi/g combined radium) (Figure E-1). These regions have insufficient data to support the estimated relationship between combined thorium, combined radium, and gamma. Additionally, it is recognized that additional data generally above 40,000 cpm will potentially decrease the standard error of the slope estimate of the regression. Given the large number of samples for comparison (greater than 1,400), the population density in many areas of greater than 40,000 cpm will be available for further development of these regressions.”

Comment: Describe how the proposed gamma count target ranges for both Thorium and Radium were determined. Using Figure E-1, it appears the lower end of the gamma count target range corresponding to 7.9 pCi/g is much less than the proposed CPM of 40,000.

3. Appendix E, Section 4.1, Page E-19: *“Based on these correlations and analyses (thorium to radium regression [Figure E-12], gamma to thorium [Figure e (sic), and gamma radium E-14] it appears the thorium concentrations estimated from gamma above 52.9 pCi/g are reasonably approximated for the multiple indicator kriging process, although they may be biased high in some cases.”*

and

Quality Assurance Project Plan Table 11-3, Page 26 of 156: *“When radium is between 2.8 and 10-13 pCi/g, as detected by a sodium iodide 2-inch meter, site empirical data suggest that thorium is either below 52.9 pCi/g or can be estimated from the gamma radium relationship. Therefore, when gamma detect Ra between 2.8 and 10-13 pCi/g thorium soft data will be assigned an indicator based on multiple indicator kriging (MIK) process, which includes standard error (from gamma radium and gamma to thorium regressions).”*

Comment: The revised workplan proposes a new tool for making decisions near the range of 2.8-10 (or 13) pCi/g Ra-226. Please provide an analysis of the data that concludes if an appropriate amount and quality of data exists or include a description in an existing or new GSMO to collect data specifically from this range.

QAPP comments

4. In the Responsible Parties’ design criteria report, Section 3.0 Air monitoring, page 3-1 it states: *“Depending on the nature and scope of the OU-1 Design Investigation, additional air impact control and mitigation procedures may be necessary during the investigation field activities. It is anticipated that any such procedures, if needed, will be further defined in the DIWP and executed and reported in the subsequent RD deliverables.”* No air monitoring, impact control or mitigation procedures were found in the QAPP or FSP. Due to limited review scope, it is unknown if the work plan addressed a need or lack of need.

Comment: If not addressed in the work plan, it should be included as necessary in the QAPP.

5. In the Responsible Parties’ design criteria report, Section 5.6 Air Quality and Odor, page 5-4 it states: *“A putrescible waste investigation will be included in the DIWP. It is anticipated that this investigation will provide additional information on the odor potential from the excavated waste.”* No details of a putrescible waste investigation QAPP or FSP was found. Related comments from DNR to EPA were provided in a comment (#17) letter dated May 13, 2020.

Comment: Include adequate objectives relevant to the responsible parties’ commitment for a putrescible waste investigation for the DIWP.

6. The draft 30 percent design document introduces a number of new models that may be relevant to geotechnical investigation objectives, however there is no clear question or scope defined in the QAPP related to performance and data needs to ensure appropriate geotechnical investigations are being performed. There is also limited information in the field sampling plan other than typical geotechnical soil parameters and reference to the potential for SPT during

drilling. Related comments from DNR to EPA were provided in a comment (#17) letter dated May 13, 2020.

Comment: Provide adequate QAPP objectives related to data needs for modeling, software, or other type of geotechnical parameters to adequately demonstrate performance of RODA requirements.

7. Neither the QAPP nor FSP reference any type of gas monitoring associated with the RODA requirement for gas monitoring and control as necessary to design infrastructure or cover elements. This comment was provided in DNR's comment letter (#17) to EPA dated May 13, 2020.

Comment: Provide adequate QAPP objectives related to RODA requirements such as gas monitoring and control elements.

8. Worksheet #10: Conceptual Site Model

There is plenty of awareness of the total amount of sampling completed throughout the entire investigation process, and it is noted that each soil sampling event has identified further RIM extent where the responsible parties had previously asserted that no RIM was present. We also note the large number of samples necessary to date could be representative of a lack of efficiency of these dissociated sampling events in responding to repeated questions and comments related to known and communicated data gaps. More efficiency may be realized through fully conceptualizing the site model based on all available information in addition to fully developing a sampling plan to address specific questions with transparent and measurable criteria.

It is also noted that the application of the logic in the responsible parties' current CSM "*RIM has been identified in multiple irregular areas and volumes, and such occurrences are consistent with the use of soil materials containing radionuclides as cover material which would have been placed primarily on inclined, irregular surfaces of the working face of the refuse.*" appears selective to only those areas within the responsible parties' current boundary lines. If the logic were to be carried to a fully developed concept based on the timing of permits and continuing activity at the site, the need for considering locations outside of the current OU-1 box should be apparent. This concept of daily cover material, if developed, could be used specifically to support data gap "*(7) Boundaries of Area 1 and Area 2 related either to the extent of waste (with regard to the purposes of cap design) or in some cases the extent of RIM;*" with the extent of RIM also for the purposes of cap design as required by the ROD amendment.

Based on aerial photographs of 1973, the activities between Area 2 and the Inactive / Demo landfills appear very fluid. If one assumes that RIM material was utilized immediately, the continuous nature of those activities could suggest that an appropriately staggered sampling program may address the bulk of the daily cover site model if that assumption applies. If one assumes longer delays were possible in utilizing staged RIM material, the potential for the daily /intermediate cover model would move south further into both the inactive and demo landfills based on activities noted on subsequent aerial photographs. Since this may have been a

relatively continuous process, an appropriate and unrestricted step-out plan may be sufficient to address the potential for the delayed utilization assumption.

However, one difficulty in relying solely on the Responsible Parties' geostat-based daily cover model is the preponderance of information supporting the final cover model. The final cover model, when compared with permits and engineering reports referenced in our previous comment letter dated May 13, 2020, describes a number of areas within a small time window between 1973 and 1974 that correlates well with the timing of the arrival of RIM at the site. Some of these permits, specifically #218903 areas 1 and 3, and #118903 do not overlap or have contiguous boundaries with the responsible parties current boundary lines. This presents a significant potential for discontinuous locations of RIM that may not be captured with either staggered boundary borings or step-outs.

Past comments related to the conceptual site model can be found in DNR comment letters to the responsible parties dated April 10, 2015 (#4,10); to EPA dated January 12, 2016 (#4); March 15, 2016 (#2, 10); email to EPA dated March 23, 2016; dated March 13, 2017 (many); dated August 30, 2017 (many); through the proposed plan and still continues through the remedial design.

Comment: To address both site model concepts, an appropriate boundary sampling program that utilizes a staggered boring program along the boundary, an unrestricted step-out program, and a separate discontinuous sampling program should be applied in the demolition and inactive landfills. The decision criteria for screening and sample selection should be clearly demonstrated in the QAPP/FSP and be sensitive enough to identify thorium at 7.9 pCi/g. It is not expected that this exercise will result in appreciably more sampling if some of the current high density sampling locations were reduced to compensate. For example, since the current pragmatically adjusted CDF model illustrating a 0.25 to 0.75-probability 52.9 pCi/g RIM shell will likely change with new data and further model development, the number of initial borings based on the draft model probabilities could potentially be reduced to compensate.

9. Worksheet 11: Project/Data Quality Objectives

Table 11-1, PSQ-1, page 18: *"What is the spatial and depth distribution of activity concentrations within Area 1 and Area 2 as related to the RODA? (Estimate)"* The ROD amendment states: *"Additional samples will be collected, as necessary, during the RD phase to confirm the extent of RIM near the boundaries of Area 1 and 2 to ensure that the engineered cover is properly placed over all areas where RIM will remain on Site."* The responsible parties identified the RODA statement in Section 11.0 of their design criteria report and stated: *"The extent of waste and RIM will be confirmed during the design investigation through additional borings."* Numerous related comments were provided to EPA in a letter dated May 13, 2020.

Comment: In order to ensure that the engineered cover is properly placed over all areas where RIM will remain on Site, delete *"within Area 1 and Area 2"* and utilize all available information to develop an effective OU1/OU2 boundary sampling plan consistent with the RODA and Statement of Work Item 3.6(a)(1)(iii).

10. Table 11-1, PSQ-4, page 18:

Comment: Explain why PSQ-4 appears to have different alternative actions than PSQ 2.

11. Step three, page 22: *“Site data and associated regressions of radium and thorium, gamma and radium, as well as gamma and thorium (provided in Appendix E of the DIWP) suggest that thorium can be predicted at or near 52.9 pCi/g using soft data”* Related comments were provided by DNR to EPA in letters dated March 13, 2020 (25, 26,); dated August 30, 2017 (general, 70, 74, 75, 76); June 21, 2017 (#9,10); October 10, 2017 (#25, 83)...

Comment: Explain the process for soft data thorium prediction at 7.9 pCi/g sufficient to ensure data of adequate quality will be collected for the proposed scanning techniques.

12. Step four, page 23: *“Although the Site boundaries reflecting Areas 1 and 2 are generally understood (EMSI 2018), and further data collection is proposed to improve the accuracy of the RIM greater than 7.9 pCi/g boundary in Areas 1 and 2. Areas 1 and 2 are surrounded by fencing which makes the approximate OU-1 boundary easy to visually distinguish.”* Based on the substantial expansion of the Area 1 and 2 boundaries during the RIA, and based on a CSM that relies on historical information rather than an irreproducible geostatistical model output, it does not appear that the responsible parties understand OU1 boundaries well enough for remedial design.

Comment: Replace statement with “Data collection is proposed to determine the 7.9 pCi/g RIM boundaries for the purpose of determining UMTRCA cover extent and IC / EC needs.”

13. Step four, page 25, sediment: *“Based on this information, the extent of potential Site-derived radiological impacts due to erosion of surficial RIM in Area 1 and from the southeastern portion of Area 2 are topographically constrained to the perimeter drainage ditch conveying runoff to the impoundment, and the North Surface Water Body itself.”*

Comment: Insert “presumed” before topographically.

14. Table 11-3, PSQ 3: *“Missouri 10 CSR 80-3 App I groundwater detection monitoring constituents for solid waste plus radiological constituents: Ra-226, Ra-228, U-234, U-235, U-238, Th- 228, Th-230, Th-232”* This description appears to reduce the full list of groundwater constituents identified in ARARs and as COPCs.

Comment: Revise the description to be inclusive of all ARARs and ensure groundwater sampling objectives and parameters are sufficient to attain ARARs and meet objectives of the RODA.

15. Table 11-3, PSQ 3: *“Not applicable at this stage. Monitoring is to establish baseline concentrations of constituents in groundwater.”* Groundwater ARARs and all COPCs are applicable for monitoring constituents in order to identify what constituents need baseline concentrations established and what potential or future action levels may be.

Comment: Delete “Not applicable at this stage” and ensure groundwater sampling objectives and parameters are sufficient to attain ARARs and meet objectives of the RODA.

16. Worksheet 15

The completeness of worksheet 15 could not be verified. However, some parameters appear to be missing (GW examples COC-zirconium, U as metal, Gross Alpha as MCL). Detection levels were not reviewed for appropriateness.

Comment: Ensure groundwater sampling objectives and parameters are sufficient to attain ARARs and meet objectives of the RODA.

Field Sampling Plan Comments, sonic drilling and soil sampling focus

17. Section 2.2.1.2, page 2-9: *“Sonic drilling has been shown to penetrate...”* As noted in the paragraph, the presence of rubber/wood, plastic trash materials that may absorb sonic may create low recovery in some intervals.

Comment: Consider if there needs to be a minimum material recovery specified from a minimum number of intervals specified, else a particular boring may not yield data of sufficient amount and quality for the study and drilling should be offset to an alternate location.

18. Section 2.3.1.2, Drilling Procedure, page 2-11: *“...ASTM D1586 and/or ASTM D3350...”* ASTM D3350 relates to standard specifications for polyethylene pipe and fittings. Page 4-1 references also discusses D3350/D3550M-17 is Standard Practice for Thick-Walled, Ring-Lined, Split Barrel, Drive Sampling of Soils. https://doi.org/10.1520/D3550_D3550M-17 Going to the provided link, both highlighted mentions should be to ASTM D3550.

Comment: Revise as appropriate

19. Page 2-11, 2.3.2.1, Sampling Strategy, page 2-11: last sentence in section, *“..., if necessary.”*

Comment: Summarize circumstances that would make it necessary to obtain MGS variance in the plan.

20. Figure 1, Proposed Area 1 Borings: A lack of perimeter borings were noted on the southeast side of Area 1 with borings PB-117 and PB-118 SW Area 1 being the two 100' depth borings. This figure raised questions. DIWP page 3-5, Section 3.2.1 was consulted and noted the language *“This spacing was judgmentally determined through professional judgment to be adequate for fulfilling the goal of characterizing the perimeters of Areas 1 and 2, particularly and includes a significant increase in RIM boring density when considering that in areas where historical data indicates the presence of RIM boring density was increased significantly.”*

Comment: We hope this *“judgmentally determined through professional judgment to be adequate”* adequately considered all information available and sufficiently addresses any applicable requirements of the RODA.

21. Figure 2 and Figure 4: No information was found regarding rejection of sampling locations during background sampling. Foreign materials such as brick may be encountered which can be present in urban environment even if the location is currently overgrown. DNR found brick

materials during surface sampling near Lot2A2 in overgrown locations. I did not see this type of discussion either in the FSP or other referenced locations.

Comment: Include information addressing potential rejection of sampling locations.

22. Figure 2:

Comment: Provide more information on the purpose of “perimeter borings” in the middle of the buffer zone.