



Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

DEPARTMENT OF NATURAL RESOURCES

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AUG 20 2013

Mr. Brian Power
Area Environmental Manager
Republic Services, Inc.
13570 St. Charles Rock Road
Bridgeton, MO 63044

RE: North Quarry Contingency Plan – Part 2, Bridgeton Landfill, LLC, Permit Number 0118912,
St. Louis County

Dear Mr. Power:

This comment letter is in response to Republic Services' submittal entitled "Bridgeton Landfill North Quarry Contingency Plan - Part 2" (Contingency Plan – Part 2) dated July 26, 2013. The document was submitted pursuant to Sections 17.A and 22.B of the First Agreed Order Case No. 13SL-CC01088. The Contingency Plan – Part 2 was prepared by Civil & Environmental Consultants, Inc.; Cornerstone Environmental Group LLC; SCS Engineers; Feezor Engineering, Inc.; and P.J. Carey & Associates, P.C.

The completion of the entire Contingency Plan relies on timely implementation of the isolation barrier investigation in order to identify a suitable location for such barrier between the Bridgeton Sanitary Landfill North Quarry and West Lake Landfill Operable Unit 1, Area 1 (radiologically contaminated area). This information will be used to finalize the Contingency Plan and thus ensure that the subsurface smoldering event does not reach the radiological contamination. Therefore, the Department of Natural Resources (Department) has focused the initial review of the Contingency Plan – Part 2 on Section 4.0 titled "Preliminary Plan for Contingent Isolation Barrier" as well as the Isolation Barrier Schedule and Gamma Cone Penetration Test (GCPT) Work Plan and Gamma Cone Penetration Test (GCPT) Health and Safety Plan (Appendices D and E). The Department discussed the comments contained in this letter at the monthly meeting held August 19, 2013. Comments on the remainder of the Bridgeton Landfill North Quarry Contingency Plan – Part 2 document will be sent in a separate letter.

This comment letter was developed with input from the Department's Hazardous Waste Program, Missouri Department of Health and Senior Services (MDHSS), and the U.S. Environmental Protection Agency (EPA). MDHSS and EPA comments are provided as enclosures to this letter.

General Comments:

1. Definition of Radiological Impact Material (RIM). The document needs to be clear on what is meant by radiologically impacted material. The last sentence of the first paragraph of Section 4.1 of the Contingency Plan – Part 2 states, “It is proposed that the Isolation Barrier be located at the shallowest practical location outside of the radiological materials.” The Appendix D – Isolation Barrier Schedule and Gamma Cone Penetration Test (GCPT) Work Plan (hereafter referred to as the “Work Plan”) goes on to use the term “radiologically impacted material” followed by “above background” and elsewhere references the Supplemental Feasibility Study which calculated radiologically impacted material (RIM) as material greater than five (5) pCi/g above background. The Work Plan should use the term “radiological materials” to be consistent with the Contingency Plan – Part 2 as well as the First Agreed Order, Section 22.B.iii, when discussing suitable locations for the isolation barrier. The Work Plan shall define the term “radiological materials” as any material with radiological readings above a statistically determined background concentration.
2. Calculating Background. The Work Plan shall include methods to collect additional laboratory samples to establish representative radiological background levels at this site. A statistically defensible number of samples shall be collected within known uncontaminated areas to calculate background levels. The Department has previously cautioned on using a limited number of samples to calculate background levels via comments on the Supplemental Feasibility Study (SFS) Work Plan.
3. Core Samples. The subsurface investigation shall include continuous soil core samples from a subset of sampling locations to verify the contents of the subsurface material encountered by the GCPT as well as to collect soil samples for laboratory confirmatory analyses. Since the GCPT will rely solely on sensors built into the cone tip, retrieval of continuous soil cores will be vital to verify the readings received from the GCPT. Core samples shall be collected near GCPT locations along the potential barrier alignments and advanced to native materials which will give the most valuable information on subsurface conditions (e.g. type of solid waste encountered), barrier construction geotechnical data as well as verification of GCPT readings. Please note that if elevated radiological readings are encountered at the first proposed alignment, additional continuous soil cores to the south may be warranted. A sonic drill rig is ideal for obtaining such continuous soil cores in these type geological conditions. The GCPT may be conducted prior to the core samples being completed. The GCPT can be conducted prior to the core sampling.
4. Replacing Well D-14. Section 4.2, first sentence of last paragraph states, “As discussed in the GCPT Work Plan, the investigation will also confirm the depth to native material and provide additional information on the general contents of the subsurface material (i.e.

- rock, municipal solid waste, construction and demolition waste, etc.)” Furthermore, the GCPT Work Plan, Section 3.1, fourth sentence of the first paragraph states, “In addition, information is to be collected at each location regarding the stratigraphy, nature, and geotechnical properties of the materials as well as liquid levels, as relates to the design of the barrier system.” In order to obtain all necessary information regarding hydrogeology and groundwater characteristics for the design of the barrier system, the existing monitoring well D-14 shall be repaired or replaced during this investigation since it is the only well in the vicinity of the proposed barrier alignments. During recent sampling events it has been verified that monitoring well D-14 is damaged at a depth of approximately 30 feet below ground surface. This well no longer meets Missouri Well Construction Rules and therefore any data collected such as potentiometric surface is questionable. Information regarding the groundwater level, flow rates, and potential contaminants is crucial to the design of the barrier. This information will be used to determine the ideal barrier alignment, plans for dewatering of trenches, and final disposition of any water encountered during construction. Additional wells along the proposed barrier alignments may also be necessary to obtain this information.
5. Alpha and Beta Emitters. The Work Plan states that the GCPT will only detect gamma radiation. West Lake Landfill Operable Unit 1, Area 1 also contains alpha and beta emitters such as Thorium-230. In order to measure for alpha and beta emitting radionuclides, continuous soil core samples shall be collected from a subset of sample locations to obtain laboratory samples for radionuclide analyses, such as Thorium-230, as well as verification of gamma readings from the GCPT. See General Comment #3 for locations of continuous soil cores.
 6. Other Hazardous Substances. In addition to radiological contaminants, West Lake Landfill Operable Unit 1, Area 1 has the potential for containing chemical contaminants such as volatile organic compounds, semi-volatile organic compounds, heavy metals, and hazardous substances such as asbestos. The Work Plan shall also include provisions for sampling for hazardous chemicals and substances which may pose health risks to isolation barrier workers. Such samples can be collected from the continuous soil cores as discussed in the previous comments.
 7. Data Comparability. The Department notes that previous investigations conducted during the Remedial Investigation for Operable Unit 1 utilized other analytical methods besides gamma radiation detection to identify radiological materials. Additional analytical methods shall be included that are comparable to the historical data collection such as laboratory soil samples for Uranium-238, Uranium-235, and Thorium-232 decay chain radionuclides (see Remedial Investigation Report dated April 10, 2000). These additional analytical methods can be obtained by collecting continuous soil core samples as described in the previous comments.

8. Sampling Locations. The array of proposed GCPT sampling locations shall be extended to the newly installed perimeter fence to the south of Operable Unit 1, Area 1 in the vicinity of WL-120 to ensure that no radiological material is present on the Bridgeton Landfill side of the barrier (see Figure 3). The distance between sampling locations should be similar to those at the potential barrier alignment (i.e. same spacing as GCPT 12-1 through 16-1). If elevated radiological readings are encountered at the fence line, the sampling locations shall be continued outside the fence toward the North Quarry until the perimeter of elevated radiological readings is found.
9. Screening and Decontamination Procedures. In general the screening and decontamination procedures are poorly presented and widely distributed throughout the Work Plan. A new section dedicated to screening and decontamination procedures should be created (such as 3.4 Screening and Decontamination Procedures) and compile the relevant discussions from Section 3.2.1.3 GCPT Rig Decontamination, Section 3.3.4 GCPT Logging, Section 3.3.5 Decontamination, and Section 3.3.6 Radiological Contamination Screening and Exit Procedures. Under no circumstances shall wash water be discharged onto the ground without prior characterization.
10. Regardless of the Work Plan results (i.e. although unlikely, if the entire testing zone has RIM, etc.), an Isolation Break plan must be submitted that separates the subsurface smoldering event from OU 1 Area 1.

Specific Comments:

11. Section 4.2 of the Contingency Plan – Part 2 does not give a clear schedule for the GCPT investigation. Include verbiage that clearly indicates the GCPT investigation will begin immediately following approval of the Work Plan.
12. Appendix D, Section 1.3, Goals of the Investigation. Please add additional primary goals to be consistent with language in Section 4 of the Contingency Plan – Part 2:
 - Determine depth to native material
 - Determine type of waste/subsurface material (i.e. rock, municipal solid waste, construction and demolition waste, etc.)
13. Appendix D, Section 2.1, Prior Investigation Methods. The fourth sentence states that eight radionuclides were identified as contaminants of concern but only seven are listed.
14. Appendix D, Section 2.3, SFS Estimate of RIM Boundary. For the purposes of this investigation, any radiological readings above background will define radiological materials (See General Comment #1). Therefore, this section needs to be revised to

- explain what is defined by radiologically impacted material (RIM). If the definition of RIM from the Supplemental Feasibility Study (SFS) will still be used to depict boundaries of areas to be excavated under a cleanup scenario, a distinction between the SFS RIM and radiological materials above background will need to be made.
15. Appendix D, Section 3.2, Gamma Cone Penetration Testing (GCPT). The last sentence of the second paragraph of this section states, "The advance rate is approximately one inch (1") per minute." Is this advance rate correct?
 16. Appendix D, Section 3.2.1.2.1, CPT Device (Lithology Calibration). This section describes the use of previous boring locations WL-108, WL-111, and WL-119 to "calibrate" the GCPT sensor to various zonation conditions. Review of these bore logs included in the Appendix reveals that there is no "zonation" identified in the majority of the boring strata. The purpose of the GCPT is to fill in the data gaps from the previous investigation such as the lack of zonation detail in these bore logs (i.e. soil, rock, municipal solid waste, construction and demolition waste, etc.). Therefore, the Department does not understand how these bore logs can be used to "calibrate" the device. Other means to calibrate and/or verify the sensor readings shall be used such as collecting continuous soil core samples from a subset of locations as described in previous comments.
 17. Appendix D, Section 3.2.1.2.2, Gamma Sensor (Radiologically Impacted Material Calibration). Due to the heterogeneity of radiological contamination, the use of previous borings (PVC-38) to calibrate the gamma sensor is not advisable. Background measurements shall be established within a known uncontaminated area, preferably outside of Operable Unit 1, Area 1. If calibration to a radiological reading is required, discreet soil samples can be collected directly from the contaminated interval. A range of gamma readings from the GCPT should be verified with discreet soil samples to determine if the sensor can accurately measure impacted radiological materials slightly above background and not just highly contaminated materials versus non-detect. This section should also describe a method to perform a response check of the GCPT instrument at the beginning and end of each day to verify the detector's response.
 18. Appendix D, Section 3.2.1.3, GCPT Rig Decontamination. The first sentence states, "Contamination will be evaluated per the CPT rig operator's decontamination procedure, and will at a minimum consist of scanning all rods which were advanced below the ground surface." More detail on the decontamination procedures of the drill rods is needed including what equipment is being used to scan the drill rods. See General Comment #9 regarding compilation of decontamination procedures.

19. Appendix D, Section 3.2.1.3, GCPT Rig Decontamination. The fifth sentence of this section states, "The wash water will be discharged onto the ground within the Area 1 decontamination pad and allowed to infiltrate into the gravel surface." Due to the potential to encounter radiological and other contaminants, the wash water shall be containerized and characterized prior to disposal. If acceptable, the wash water can be disposed into the leachate collection system. Any solids generated during drilling activities should also be containerized and characterized for proper disposal. See General Comment #9 regarding compilation of decontamination procedures.
20. Appendix D, Section 3.3.1 Land Clearing. The fourth sentence of the first paragraph states, "The vegetation will be cleared by selective woody vegetation removal techniques which allow small track mounted machines to cut and grind the vegetation in place." This activity should be kept to a minimum. Extra effort shall be given to find suitable paths that do not require grubbing. Additional provisions should be included in the Work Plan to minimize/eliminate the use of machines that will grind vegetation and instead use handheld equipment to clear/prune vegetation where practicable.
21. Appendix D, Section 3.3.1 Land Clearing. The third sentence of the second paragraph states, "The paths will be guided by an onsite health physicist who will conduct an overland gamma scan." Please include more detail on the overland gamma survey including the procedure and methodology.
22. Appendix D, Section 3.3.1 Land Clearing. The last paragraph contains a couple typographical errors. The word "about" in the third sentence should be replaced with "above". The word "truck" in the fifth sentence should be replaced with "trunk".
23. Appendix D, Section 3.3.2 Near-Surface Preparation. The second paragraph of this section describes removal of surficial layers of concrete and other inert rubble with a track hoe prior to the GCPT investigation. This activity should be kept to a minimum. The text should be revised to state this and also include provisions to survey and log the depth of any such material that is relocated, if necessary.
24. Appendix D, Section 3.3.4, GCPT Logging. The third to last sentence of the first paragraph states, "After the boring is completed, the GCPT rig will be decontaminated within the non-radiological decontamination area if no RIM was encountered." Please clarify why the GCPT rig will be decontaminated if no RIM is encountered, such as decontamination for non-radiological contaminants. Also please consolidate screening and decontamination procedures (see General Comment #9).

25. Appendix D, Section 3.3.4, GCPT Logging. The last sentence of this section states, "Each sounding hole will be filled with bentonite-coated pea gravel from the surface." Missouri Well Construction Rules, **10 CSR 23-6.050(A)**, states that test holes with no surface casing must be filled with grout via tremie to within two feet (2') of the ground surface.
26. Appendix D, Section 3.3.5, Decontamination. The discussion in this section should be compiled into a new section titled Screening and Decontamination Procedures (see General Comment #9).
27. Appendix D, Section 3.3.6, Radiological Contamination Screening and Exit Procedures. The discussion in this section should be compiled into a new section titled Screening and Decontamination Procedures (see General Comment #9).
28. Appendix D, Table 1. This table does not include a trigger for commencing with construction of the isolation barrier (i.e. there needs to be a decision point between the last two boxes that coincides with the triggers in Part 1 of the Contingency Plan).
29. Appendix E, Section 5.3, Chemical Hazards. This section does not mention the potential for encountering hazardous waste, putrescible waste, and landfill gases during the GCPT exercise. No action plan has been provided to investigate, characterize, and abate potential exposure to chemicals. Methodology to monitor for encroachment into contaminated soils or detecting vapors emitted from within borings should be provided. The Health and Safety Plan (HSP) should discuss the potential for exposures, and include a contingency plan to protect workers from exposure. Worker protection standards must be met in the event these potential hazards are encountered. Update the HSP accordingly.
30. Appendix E, Section 5.4.2, Radiological Controls. This section should include procedures for use of real-time measurement devices such as dose rate meters and dosimeters to measure worker exposure to radioactivity.
31. Appendix E, Section 6, Training. This section of the Health and Safety Plan does not include specific training requirements of on-site workers. Please include specific training that meets the requirements of 29 CFR 1910.120 and other general training such as General Employee Training (GET) and General Employee Radiological Training (GERT). The Department expects workers to meet these training requirements at similar sites.

Please submit a revised Contingency Plan – Part 2, Section 4.0 along with revised Appendices D & E within 20 days of receipt of this comment letter per Section 11 of the First Agreed Order. Please be aware that the revised Appendix D Work Plan prepared by Feezor Engineering, Inc.

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will need to be signed and sealed by a professional engineer registered in the state of Missouri as was previously. If the any part of the revised Contingency Plan – Part 2 requiring seal is submitted using an FTP site, please also provide an original, sealed document sent to the Department at P.O. Box 176, Jefferson City, MO 65102-0176.

If you have any questions or comments regarding this letter, please contact myself, Branden Doster or our Solid Waste Management Program Director, Chris Nagel at (573)526-3940.

Sincerely,

SOLID WASTE MANAGEMENT PROGRAM



Charlene S. Fitch, P.E.
Chief, Engineering Section

CSF:cfl

In cooperation with,

HAZARDOUS WASTE MANAGEMENT PROGRAM



Branden Doster, P.E.
Chief, Federal Facilities Section

BD:cfl

Enclosures

- c: Peter Carey, P.E., P. J. Carey & Associates, P.C.
Michael Beaudoin, P.E., Civil & Environmental Consultants, Inc.
Mr. Ronald Hammerschmidt, U.S. Environmental Protection Agency, Region VII
Mr. Dan Gravatt, U.S. Environmental Protection Agency, Region VII
Mr. Joseph Binbeutel, Attorney General's Office
Mr. Jonathan Garoutte, Department of Health and Senior Services
Ms. Laura Yates, St. Louis County Department of Health
Ms. Kyra Moore, Air Pollution Control Program

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Mr. Alan Reinkemeyer, Environmental Services Program
Mr. Larry Lehman, Chief, Compliance/Enforcement Section, SWMP
Ms. Brenda Ardrey, Chief, Operations Section, SWMP
St. Louis Regional Office via Electronic Shared File