



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7**

11201 Renner Boulevard
Lenexa, Kansas 66219

Mr. Paul V. Rosasco
Project Coordinator
Engineering Management Support, Inc.
25923 Gateway Drive
Golden, Colorado 80401

Re: West Lake Landfill Superfund Site, Operable Unit 2, Explosive Gas Monitoring Plan

Dear Mr. Rosasco:

The U.S. Environmental Protection Agency (EPA) has reviewed the West Lake Landfill, Operable Unit 2 (OU-2), Explosive Gas Monitoring Plan, submitted on July 10, 2020 by Civil and Environmental Consultants, Inc (CEC), on behalf of the Respondent, Bridgeton Landfill, LLC. This document was developed to support the Remedial Design of the Inactive Sanitary Landfill portion of OU-2.

The EPA has coordinated its review of this document with the Missouri Department of Natural Resources and the U.S. Army Corps of Engineers, Kansas City District. Based upon the comments generated during the review, the EPA is disapproving the document as submitted.

During the EPA's coordinated review of the document, on August 7, 2020, the Respondent informed the EPA of their intent to change contractors for the remaining OU-2 Remedial Design activities. The approved Remedial Design Work Plan (RDWP) and associated planning documents were completed and signed by CEC. A change in contractors will require changes to and resubmittal of the Quality Assurance Project Plan and Sampling and Analysis Plan for approved portions of work under the RDWP.

In accordance with the Third Amendment to the Administrative Settlement Agreement and Order on Consent, VII 94-F-0025, the Respondent shall prepare and submit a revised Explosive Gas Monitoring Plan that incorporates the enclosed comments and requested changes within 30 days of your receipt of this letter. If you have any questions or concerns, please contact me either by phone at (913) 551-7910 or by e-mail at schwartz.jamie@epa.gov.

Sincerely,

Jamie Schwartz
Remedial Project Manager
Site Remediation Branch
Superfund and Emergency Management Division



Enclosure

cc: Mr. Ryan Seabaugh, MDNR

EPA Comments on the West Lake Landfill Superfund Site, Operable Unit 2, Explosive Gas Monitoring Plan, dated July 10, 2020

1. **General.** Details regarding field activities including sampling procedures, equipment to be used, supplies, equipment calibration, and decontamination procedures for non-dedicated equipment are not included in this Explosive Gas Monitoring Plan (EGMP) and there are no references made to the Quality Assurance Project Plan (QAPP), Sampling and Analysis Plan (SAP), or the Health and Safety Plan (HASP) from the approved Remedial Design Work Plan (RDWP). Additionally, the RDWP SAP provides none of these details either. This plan shall be revised to include a QAPP and SAP addendum, along with appropriate Job Safety Analyses (JSAs), or provide appropriate references to the relevant sections of the approved Remedial Design Work Plan should that document provide the appropriate level of detail.
2. **General.** The RDWP refers to the landfill gas monitoring wells as temporary, but throughout this EGMP the wells are referred to as permanent. Review and revise the EGMP for clarity and consistency on the nature of these wells.
3. **Cover Page.** The document is titled ‘Explosive Gas Management Plan’ but all other references within the document state ‘Explosive Gas Monitoring Plan’. Additionally, this plan discusses monitoring gas, rather than managing gas. Modify the title on the cover page to state ‘Explosive Gas Monitoring Plan’.
4. **Section 1.0 Introduction, Pages 1 - 2.**
 - a. The last sentence of the fourth paragraph in this section states “*Each sub-unit is believed to be separated by natural geologic materials...*” This statement is vague and creates uncertainty regarding the actual separation of these units. Revise to more clearly explain the basis for this statement and provide supporting data or delete this statement.
 - b. The first full paragraph on page 2 states “*Historic records indicate that the wastes disposed of in the ISL consist primarily of municipal wastes.*” This statement lacks sufficient detail to understand the relevance to this monitoring plan. Revise to include sufficient details or delete this statement.
5. **Section 2.1 Drill Cores, Page 1.** This section states drill cores will be retrieved for physical observation. Section 2.3.3 of the QAPP states “*Geologic stratigraphy along the western perimeter of the ISL, with an emphasis on identifying zones that may allow gas migration as well as estimated depth of refuse;*” will be observed as part of the landfill gas migration study and QAPP Section 6.3 states that soil will be logged for lithology and visually inspected for waste materials. A discussion of these activities was not included in the EGMP other than “*physical observation*” will be completed. Please review and revise this section to include additional details related to the documentation of the soil core lithology and identification of waste materials.
6. **Section 2.3 Radius of Evaluation, Page 4.** This section states that existing structures within OU-2 are not identified because they are addressed in the Bridgeton Landfill EGMP; however, no details regarding the Bridgeton plan are included as part of this submittal. Revise this section to provide a specific reference for the Bridgeton Landfill EGMP, including the official document title and date. Also, provide a copy of the Bridgeton Landfill EGMP as an appendix to this OU-2 EGMP.

7. **Section 2.4 Potential Explosive Gas Migration Pathways, Page 5.** Revise the second sentence of the first full paragraph on this page to read “... *within the 1,000 foot radius of the Site.*”
8. **Section 2.5 Other Potential Sources of Explosive Gas, Page 5.**
 - a. This section does not include the below ground natural gas pipeline that exists along the Old St. Charles Rock Road that enters the site at the southwest gate, between the ISL and Bridgeton Landfill. Revise this section to include this pipeline in the discussion.
 - b. The Bridgeton Landfill is briefly mentioned in this section, but there is no discussion of the ongoing landfill gas corrective action or monitoring activities. Revise to provide a statement indicating whether these additional landfill gas reports have been reviewed for information pertinent to the ISL EGMP.
 - c. After the first sentence in this section, insert “*The Missouri Department of Natural Resources’ Waste Management Program (WMP) oversees the gas management activities at Bridgeton Sanitary Landfill (BSLF). Their regulatory role is to ensure that the current gas collection and control system (GCCS) is effectively controlling gas generation and migration at the Bridgeton Sanitary Landfill. The BSLF GCCS is continuously evaluated and upgraded as necessary to ensure it is operating at peak performance. Potential gas migration pathways are routinely investigated, and measures taken to mitigate any migration.*”
 - d. The second sentence states, “*In addition, based on regional geology, the potential for lenses of buried naturally occurring organic materials associated with alluvial events cannot be discounted as potential sources of explosive gas.*” Revise to include additional information regarding this statement, including information supporting substantive layers of naturally occurring organic materials, and how it was determined to be disassociated with historical waste placement.
9. **Section 2.6 Hydrogeologic and Geological Information, Page 5.** The second sentence of the second paragraph states “*Groundwater elevations under the ISL are expected to vary in response to canal water elevation and to a lesser extent, groundwater and leachate withdrawal via pumping well K-128, located at the southeast margin of the ISL (Figure 2).*” Revise this section to include all relevant information regarding leachate pumping well K-128 to support quantification of extent of impact such as well depth, condition, pumping rates and depth of leachate measured.
10. **Section 2.6.1 Natural Site Characteristics that May Act as Natural Impervious Boundaries to Gas Migration or Allow Natural Venting of Gas, Page 6.**
 - a. The site characteristics discussed in this section (flood control canal, leachate pumping, western slope) are all manmade features, and not natural site characteristics as the title describes. Revise the title of this section to accurately describe the site characteristics discussed.
 - b. The last sentence of the first paragraph states, “*In terms of site characteristics that may influence gas migration, this interaction is deemed as the most significant with respect to factors that may influence the unsaturated zones available for gas migration.*” Unsupported statements indicating canal water levels and leachate pumping will influence the unsaturated zones available for gas migration is not sufficiently informative. Revise to include additional information on actual groundwater elevation measurements taken from groundwater

monitoring wells/piezometers located in the vicinity of the proposed gas monitoring network for the ISL to provide actual anticipated depth of the unsaturated zone.

- c. The second sentence in the second paragraph states “*At this time, the composition of this berm is not known, but will be defined through the course of ISL RD investigations (anticipated to be completed the third quarter of 2020).*” Provide a reference to the section within the OU-2 Remedial Design Work Plan which describes the detailed investigation procedures that will be performed on the perimeter berm. Ensure that either this document or the reference clarify if the entire depth of the berm will be investigated for permeability characteristics, and whether the waste boundary, in relation to the berm, will be determined during the investigation.

11. **Section 2.6.2 Potential Explosive Gas Migration Pathways and Their Associated Explosive Gas Hazard, Page 6.** This section and Section 2.4 both discuss explosive gas migration pathways and it is unclear why this is separated into two different sections. Review these sections and revise to consolidate information.

12. **Section 2.6.2 Potential Explosive Gas Migration Pathways and Their Associated Explosive Gas Hazard, Page 7.** The first sentence of the last paragraph states, “*In addition to these alluvial deposits, two utility corridors including fiber optic and a sanitary sewer run parallel to Old St. Charles Rock Road on the western perimeter of the ISL.*” Revise this section to include a discussion of how these utility corridors and other discovered preferential pathways will be investigated for potential gas migration.

13. **Section 2.7 Identification of Other Sources of Explosive Gases, Page 7.** This section and section 2.5 both discuss other sources of explosive gas and it is unclear why this is separated into different sections. Review these sections and consider consolidation for conciseness.

14. **Section 2.8 Geologic Cross Sections and Potential Natural Pathways, Pages 8 - 9.**

- a. Table 1 represents the estimated elevation of the base of waste identified in historic borings. Boring LR-103 is included and states “*Decayed Vegetation*” in the comments. Upon review of the boring log for LR-104, which is similar to LR-103, indications of decayed plant matter and traces of carbonized wood were identified; however, this information is not included as part of Table 1. Please provide a discussion regarding the decayed vegetation encountered in these borings and their relevance to landfilled materials.
- b. The ground surface elevations are reported in “*fmsl*”; however, this is not defined in the document. Revise to include a definition for “*fmsl*”.
- c. The second sentence of the last paragraph in this section on page 9 states “*Correlating this boring data to normal water surface elevations recorded for the Levee District canal (433.0 per Earth City Levee District datum), the lower 8 to 10 feet of waste within the ISL could potentially be saturated.*” Recorded groundwater elevation measurements from nearby groundwater wells/piezometers should be utilized to determine saturated elevations as the canal water level may not be indicative of actual groundwater levels. Revise this section to include the most recently measured groundwater elevations in the area of investigation.
- d. A figure should be provided that illustrates the locations of these borings.

15. **Section 2.9 Discussion of Site Construction Details Including the Type and Characteristics of the Liner (if any), Type and Characteristics of Final Cover, and an Evaluation of Existing Cover Conditions, Page 9.** The first sentence states, “*No bottom or sidewall liners are known to have been placed within the ISL.*” Site documents indicate clay liners and other infrastructure were required as part of permitting for post-state regulatory units #118903 and 218903 within the Inactive Sanitary Landfill. Revise this sentence by replacing “within” with “at the base of”.
16. **Section 2.10 Description of any Existing and Operating Gas Extraction or Gas Venting System, Page 9.** This section states “*No existing gas collection or venting system is present at the ISL.*” While there may not be record of such a system, an existing conditions investigation is being conducted which will evaluate existing infrastructure. This statement should be revised to reflect that the presence of a gas collection or venting system onsite is under investigation as part of the ongoing remedial design investigation activities.
17. **Section 2.11 Description of Any Existing Explosive Gas Monitoring System and an Evaluation of its Effectiveness, Pages 9 - 10.** This section states, “*To date, this Bridgeton Landfill EGMP has been deemed effective at detecting gas migration from the Bridgeton Landfill, and mitigating off-site impacts to occupied structures or associated properties.*” While the system has been effective at detecting gas migration, this statement does not accurately reflect the ongoing landfill gas migration mitigation project in an area between the ISL and Bridgeton. Revise this section to include a discussion of ongoing landfill gas mitigation activities related to Bridgeton Landfill.
18. **Section 2.13 Review and Summary of Historical Records Pertaining to Explosive Gas Investigations, Pages 10 - 11.** This section includes a single paragraph that states, based upon the Record of Decision (ROD), there is limited gas generation potential in the ISL and refers to “*Sections 5.3, 9.2, 12.2 and 13.2 of the ROD for additional information on these historical investigations.*” Based on review of the referenced sections, Section 5.3 of the ROD is the only section that summarizes investigations that were performed. It is not clear that all historical records were reviewed, and the section lacks a summary of records. Revise this section to provide a detailed review and summary of historical records.
19. **Section 2.14 Discussion of the Latest Explosive Gas Investigation for this Site, Page 11.** The last sentence states, “*During this activity, no observed evidence of surficial gas migration was recorded which is consistent with findings of the RI conducted approximately 15 years prior.*” This section should be revised to include the procedures used to identify surficial gas migration and any equipment that was used to do so, along with all indicators and data that were used to make the determination there was no evidence of migration.
20. **Section 2.15.1, Page 12.**
 - a. This section states wells will be advanced to an estimated depth of base of waste, approximately 25 feet. The QAPP states “*Well* depth will extend to the known lowest base elevation of refuse based on the results of the borings to be drilled for the slope stability evaluation (Section 2.6).*” The EGMP appears to utilize data from previous borings to determine depth to bottom of waste rather than use the information that will be gathered during the slope stability evaluation. Review this section and the QAPP and provide clarification for how the depth to waste will be established.

- b. The last sentence of the first paragraph in this section shall be revised to state “...*installation of supplemental wells or screened intervals will be evaluated at that time.*”
21. **Section 2.15.3, Page 13.** For consistency with the rest of the document, revise the second sentence to state “...*located on the western side of the flood control canal operated by the Earth City Levee District, no in-building alarms...*”
22. **Section 2.17.2 Parameters to be Monitored Including Detailed Step-by-Step Instructions of the Proper Procedures to be Utilized in Conducting Monitoring, Page 14.** This section lists the parameters that shall be monitored, but there are no detailed step-by-step instructions of the procedures as the section title describes. Review this section and revise to include these procedures.
23. **Section 2.18 Contingency Procedures, Page 14.** The term “*contingency procedures*” appears to be used synonymously with the waste management ARAR term “*corrective action procedures*” as described in 10 CSR 80-3.010(14)(C)5.D. Landfill Gas Corrective Action Plans. In order to reduce ambiguity, please change instances of the word “*contingency*” to “*corrective action*”, and change “*remediation plan*” to “*corrective action plan*” to be consistent with ARAR terminology.
24. **Section 2.18.2 Contingency Monitoring, Page 16.** This section appears to indicate contingency monitoring will take place until four consecutive monitoring events indicate compliance with applicable gas thresholds, which suggests contingency monitoring may cease prior to installation of a remediation system. Revise this section to clarify how long contingency monitoring will remain in effect after a remediation system is in place that demonstrates its effectiveness at correcting the problem.
25. **Figures.** Section 2.4 of the monitoring plan states that existing infrastructure that may serve as preferential pathways for gas migration is being formally documented in the Existing Conditions Summary Report; however, a figure documenting known infrastructure would be beneficial as part of this submittal. Revise this plan to include a site infrastructure map.
26. **Appendix B, Quarterly Gas Monitoring Report Form.** QAPP Section 9.3 states, “*The additional provisions recommended include recording of “balance gas” concentration (assumed as nitrogen), evaluation of the nitrogen to oxygen ratio, and measurement of well* gas pressure (as needed).*” There does not appear to be a column for nitrogen/nitrogen to oxygen ratio on the field sheet. The field sheet should be modified to include this information to ensure it is collected.
27. **Appendix D Permanent Monitor Installation Specifications.** The title of this appendix indicates installation specifications are included; however, it appears that many sections describe only generic procedures. This appendix needs to be reviewed and revised to include project specific details related to this planned work.
- a. Section 1.2 Drilling Methods, Page 1. This section states “*Borings should be advanced with drilling technology appropriate for the subsurface conditions at the site.*” This description is generic in nature and provides no project specific details.
- b. Section 1.3 Cuttings, Page 1. This section states “*Cuttings will be disposed of in accordance with the applicable site and or local regulatory requirements.*” This description is generic and provides no project specific details.

- c. Section 3.5 Grout, Page 3. This section states “...*each boring will be sealed with a Portland Type I bentonite/cement slurry, using a tremie pipe method or a bentonite slurry grout if required by the project.*” This description does not provide project specific details.
28. **Appendix D, Figure 3.** This figure illustrates construction of a typical gas monitoring well but it does not illustrate the grout layer or the concrete apron at the surface or use call-out notes to identify each of the materials shown. Additionally, there is a note that indicates the use of pre-pack screen but the specifications indicate use of a tremied sand filter pack. Review this figure and revise accordingly.
29. **Appendix D, Specification Section 3.1, Page 2.** The first paragraph specifies a screen length of 10 feet unless otherwise specified by project specifications. Section 2.15.1 of the EGMP states the gas monitoring wells are anticipated to be approximately 25 feet deep and screened continuously from five feet below ground surface. Revise this section to clarify the anticipated screen length of 20 feet.
30. **Appendix D, Section 4 Surveying, Page 4.** The fourth and sixth bullets in this section appear to be duplicative. Revise this list to remove the duplication or provide additional details regarding the differences.
31. **Appendix D, Specification Section 6.1, Page 4.** This section states that “*natural soil materials*” will be included as a well construction material. Remove “*natural soil materials*” from the material required for well construction.
32. **Appendix D, Specification Section 6.2, Page 5.** In the first sentence, replace “...*may be decontaminated...*” with “...*shall be decontaminated...*”
33. **Appendix D, Specification Section 6.3, Page 5.** Revise the first sentence to replace “...*well development water...*” with “...*these fluids...*” because no well development water will be generated as previously stated.