STATE OF MISSOURI
Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

APR 23 2015

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

RE: Expansion of Heat Extraction Pilot Study Submittal, Bridgeton Landfill, Permit Number 0118912, St. Louis County

Dear Mr. Power:

This letter is in response to a March 27, 2015, submittal received via e-mail by the Department of Natural Resources' Solid Waste Management Program (SWMP) requesting a second expansion of Republic Services' Heat Extraction Pilot Study at the Bridgeton Landfill. The submittal included a cover letter and a five (5) sheet drawing set. The documents contained construction details for retrofitting five (5) additional gas interceptor wells (GIW-8, -9, -11, -12 and -13) with modified heat removal technology.

The submittal did not include a technical narrative detailing the reasons for the expansion including the modifications being made to the cooling point system. Specifically, no explanation was given of the evaluation that resulted in the decision to modify the cooling point design from the original design used and what operational improvements are expected to result from the modification. Additionally, the cover letter states Bridgeton Landfill is retrofitting the 5 additional GIWs with heat removal technology to "provide further understanding of the effects of heat removal at Bridgeton Landfill" and to "provide a greater level of heat removal over a larger area and additional information concerning waste variability, heat gradient and overall influence distances"; however, no explanation is provided of how this information will be gathered or when it will be reported to the SWMP. The inclusion of 5 additional GIWs infers increased heat removal will occur over a larger area, but no details are provided as to how a greater level of heat removal will occur or the additional information/data to be collected related to waste variability, heat gradient and overall influence distances or when this data will be reported to the SWMP.

The original July 22, 2014, Heat Extraction Pilot Study submission included additional temperature monitoring probes (TMPs) at 5 and 9 foot distances for this purpose and the SWMP in response to the submittal required summarization and submittal of quarterly pilot study project reports. (See Pilot Study – Plan View 003 including TMP-10-9N, -10-5N, -10-5S, -10-9S, -5-

WLLFOIA4312 - 001 - 0043694

9N, -5-5N, -5-5S and -5-9S and SWMP response letter dated September 4, 2014.) From a brief telephone discussion on April 2, 2015, our understanding is that Bridgeton Landfill determined use of TMPs -19 and -20 for analysis of the effectiveness of the heat removal technology is appropriate. From as-built drawings, it appears TMPs -19 and -20 are approximately 24 ft. and 35 ft. from the modified GIWs. Information was not provided in the submittal as to the method or assumptions used to determine that the existing TMPs are sufficient for evaluating the effectiveness of the new cooling point design being used in these 5 GIWs.

We understood this pilot study was designed and implemented to prove the technology would effectively halt progression of the subsurface smoldering fire northward. We are concerned that this second expansion request eliminates in-waste TMPs at consistent distances from the newly modified GIWs which may prevent Republic Services from presenting a defendable conclusion at the expiration of the pilot study. Without identification of additional data collection in this submittal, can you provide the details of how the results of the pilot study related to these newly modified GIWs will be validated?

Given the ongoing subsurface smoldering fire at Bridgeton Landfill, the Expansion of the Heat Removal Pilot Study permit modification request is hereby approved and incorporated into Permit Number 0118912 with the following conditions:

CONDITIONS:

1. Bridgeton Landfill will need to provide the following within 30 days of receipt of this letter:

    a. A technical narrative including, a discussion of why the proposed additional GIWs are using a different design, i.e., dual pipe system, from the original heat extraction technology, why TMPs are no longer needed at consistent distances from the newly modified GIWs to document effective heat removal using the pilot system and absent new consistently spaced TMPs what other method will be used to document the effectiveness of the system.

    b. Within the technical narrative, a discussion of how it was determined the heat extraction technology is viable given more GIWs are being retrofitted. Also, are additional heat removal points planned for installation at Bridgeton Landfill?

    c. Data collection methodology and analysis methods/protocols for the expanded system including any assumptions used and, at a minimum,

        i. Calculations used to determine thermal conductivity and heat storage properties of the landfill waste mass and the results of those calculations.

ii. Calculations used to predict the amount of heat that could be extracted under steady state conditions and the results of those calculations.

iii. An assessment of the heat front's progress to the north and the rate of energy flux to the north.

d. Provide in the technical narrative the reason the in-casing thermocouples installed at various depths in the first 7 GIWs were eliminated from this expansion of the pilot study.

e. A drawing showing all TMPs from which information will be gathered in support of this project expansion. Specifically, information related to the 5 newly modified GIWs.

i. The drawing must also identify the number and depth of all working thermocouples on each TMP used to report on these 5 GIWs.

ii. The drawing must contain a table disclosing the distance from each operating TMP to the closest GIW.

2. With submittal of the as-built drawings, a drawing that shows the liquid level in all the GIWs at the time of installation of the heat removal unit.

3. Bridgeton Landfill must continue submission of quarterly pilot study status reports as required by the SWMP's August 25, 2014, response letter.

4. The SWMP's September 4, 2014, Conditional Approval of the July 24, 2014, Expanded Heat Removal Pilot Study notified Bridgeton Landfill of the SWMP's requirement that beneficial use pilot projects are granted for a period not to exceed one year. Reports are received to evaluate the effectiveness of the project. The initial pilot project report must be submitted one month prior to the first anniversary of the project which is August 4, 2015. The pilot project will be allowed to continue while the report is being reviewed.

5. All conditions set forth in the letter of September 4, 2014, remain in effect and must be met.

The SWMP has reviewed the submittal in concurrence with the Saint Louis County Department of Health's Solid Waste Management Program.

This approval is not to be construed as compliance with any existing federal or state environmental laws; nor should this be construed as a waiver for any other regulatory requirements. This approval is not to be construed as compliance with any existing local permitting or zoning ordinances; nor does it supersede any local permitting and/or zoning requirements.

The department reserves the right to revoke, suspend, or modify this approval and/or Permit Number 0118912 after due notice for failure to maintain compliance with the Missouri Solid Waste Management Law and regulations, the terms and conditions of the permit and approved engineering plans and specifications.

If you have any questions or comments, please feel free to contact J.P. Boessen, of my staff at (573) 526-3940 or at P.O. Box 176, Jefferson City, MO 65102-0176.

Sincerely,

SOLID WASTE MANAGEMENT PROGRAM

Charlene S. Fitch

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

CSF:jbl

c: Mr. James Getting, Bridgeton Landfill LLC
Ms. Laura Yates, St Louis County Department of Health
Mr. Larry Lehman, Compliance/Enforcement Section, SWMP
Ms. Brenda Ardrey, Operations Section Chief, SWMP
Mr. Joe Trunko, St. Louis Regional Office via Electronic Shared File
Mr. Tom Phillips, Attorney General's Office
Ms. Ally Cunningham, Lathrop and Gage