

Bridgeton Landfill, LLC

May 28, 2014

Larry Lehman
Solid Waste Management Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

RE: NOV #SLR11434218

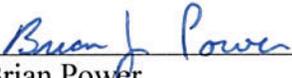
Dear Mr. Lehman:

On April 29, 2014, we received NOV #SLR11434218 dated April 21, 2014, following from MDNR's February 11, 2014, inspection of the Bridgeton Landfill. The NOV included a 10 page narrative report and more than 120 pages of attachments. Bridgeton Landfill continues to meet the directed required corrective actions, implementation of the Agreed Order and assessment and corrective actions related to odor sources. In addition we are also in the process of preparing a full response to the allegations of the NOV.

The NOV requested submission by May 31, 2014, of information regarding Items 1 and 2 of the Areas of Concern noted in the NOV. Responses to each of those items are enclosed with this letter.

If you have any questions or need additional information, please feel free to contact me at 314-744-8165.

Best regards,



Brian Power
Environmental Manager
Bridgeton Landfill, LLC

Enclosures

cc Dorothy Franklin, MDNR St. Louis Office
Aaron Schmidt
Chris Nagel

13570 St. Charles Rock Road, Bridgeton, Missouri 63044

Larry Lehman
Missouri Department of Natural Resources
May 28, 2014
Page 2

Jim Teter
Jessica Merrigan

Response to Area of Concern 1

MDNR's Area of Concern 1 addresses six areas of increased subsidence observed during the February 2014 Site Inspection. The areas of concern indicated on Photos 1-6 and on Attachment 6 are all relatively small voids that appear to have been formed by pressurized gas flowing up along a current or abandoned gas well, causing erosion of material adjacent to the well casing near the surface. This can create a circular void around or above the casing, and can create a "trampoline" hazard for operation and maintenance of the gas well. MDNR's Notice of Violation directed Bridgeton Landfill to develop and submit a plan to the Department that explains how these areas will be remediated. All of these areas have been remediated since the time of the February site inspection. However, new local settled areas have occurred, and a couple of the previously-repaired areas may need additional attention (SEW-31R and SC-5).

When localized settlement and subsidence occurs, site personnel erect caution tape around the area for safety purposes. The areas of subsidence are monitored in order to ensure safety hazards are prevented; and the cover and localized collection is maintained to prevent release of gas or leachate in order to avoid any increase in odors related to the settlement. Settlement areas that are resulting in a gas or leachate release are repaired as promptly as possible in order to prevent any increase in odors.

Previously, Bridgeton Landfill has repaired such areas using compacted soil backfill; this will be called "Alternative 1." As further described later in this response, Alternative 1 requires exposing the void and surrounding soil, resulting in a potential odor-causing event.

Another repair method developed by Bridgeton Landfill would allow surgical incision of the cap and placement of "flowable fill" to remediate the condition. This will be referred to as "Alternative 2."

Alternative 1 – Compacted Soil Backfill

1. Construct road and pad(s) on cap to provide dump truck and equipment access to the repair area;
2. Turn off subcap gas collectors in the vicinity of the repair area;
3. Cut cap flexible membrane liner (FML) at least five feet beyond limit of void in a manner what will allow material to be re-folded when complete;
4. If necessary, install a portable odor control unit near the repair site, and install a 1,500 gallon water tank on a suitable pad;
5. Conduct necessary backfilling. A rigid plate may be used with backfill to bridge soft areas;
6. Use odor control neutralizers at a suitable concentration during the backfilling process. The concentration can be adjusted as necessary to achieve acceptable neutralization and to more fully neutralize aggressive odors;
7. Adjust concentrations and nozzle spacing as necessary during the activities to neutralize the odors;

8. During the backfill process, the neutralization process can be discontinued once more permanent landfill gas extraction methods are employed in this area; otherwise maintain neutralization until backfill is completed;
9. Re-fold the FML material to cover the backfilled area; and
10. Using cap strips as necessary, fuse FML together to restore complete cap in the work area.

Alternative 2 – Placement of Flowable Fill Material

The objectives for flowable fill repairs are as follows:

- Fill the cracks/voids so that the synthetic cap is supported at all places;
- Result in a fill that is malleable so that it provides seal during future deformations with a low- to medium-strength clay consistency and an expected permeability in the range of 1×10^{-5} cm/s;
- Allow re-excavation and removal of material if needed in future,
- Create a subcap surface that supports foot and vehicle traffic
- Minimize damage to the FML; and
- Minimize odors during the performance of the repair.

The dry fill component will consist of granular materials suitable for filling applications consistent with the requirements of MDNR regulations, such as soil, cement, bentonite, or industrial residues. The material would be very fine with a maximum of medium sand-sized particles, minimizing potential for abrasion damage to the FML.

Flowable fill would be used only for small “spot-treatment” applications. A typical crack, as observed during soil filling of previous cracks, may be about 50 feet long and two feet deep requiring about 8 cubic yards (CY) of flowable fill. A typical void around a well casing, like those observed during the February 2014 inspection and documented in Area of Concern 1, would be about six feet diameter and five feet deep requiring about 2 CY of fill.

The contractor’s proposed approach is as follows:

1. Position small pneumatic tanker with dry fill component on suitable perimeter access road or main corridor landfill access road;
2. Add potable water to the dry fill material to create slurry of desired consistency in the tanker (no air will be deliberately entrained);
3. Position grout pump between the tanker and the target crack/void;
4. Cut a small incision in the FML to allow insertion of grout hose;
5. Position grout hose through incision and as far into crack/void as possible;
6. Pump flowable fill in while retracting grout hose until void is full; and
7. Repair the incision in the FML with extrusion welding techniques, applying patches as necessary.

It may be necessary to create bulkheads to prevent fill from flowing downhill or into undercap drains or other areas where it is not desired. Sand bags or tubes, plywood barriers, and other

means will be employed as necessary for this purpose. Locations of use will have to exclude those areas where there is potential to enter collection systems, clog, or negatively impact leachate removal. In addition, voids around well casings will likely require addition of bentonite pellets in the bottom of the void to create seal prior to application of flowable fill. Prior to filling we will identify the screen location of a well so that the repairs will not compromise well operation.

Alternative 2 has many advantages over Alternative 1 including preservation of cap integrity, reduction of the amount of road building, which can be damaging to the FML, and greatly reducing the potential for odors generated during the work due to the ability to avoid exposing the void.

If, at any time, a subsidence feature results in noticeable release of gas or odor, it will be repaired as quickly as practicable. Typically, however, these settlement features and cracks are well-contained by the EVOH cap, so Bridgeton Landfill will allow several of these voids to occur, and then schedule a repair contractor so that they can be accomplished together. This works well for smaller voids for which safety hazards can be avoided and which can be controlled to prevent release of gas or liquid, or any potential increase in odor. These bundled repair events allow efficient mobilization of necessary resources and minimization of duration of invasive work. In advance of completing repairs of identified subsidence features, the site team will review the landfill surface generally to identify any additional features that may require repair.

Response to Area of Concern 2

MDNR's Area of Concern 2 addresses a February 9, 2014, incident in which a limited amount of leachate was released due to a failed seal on a gas extraction well pump and a malfunction of a leachate extraction pump. The leachate was fully contained within the lined ditches and stopped by gates that prevented the leachate from leaving the lined area. MDNR requested an incident report for the February 9, 2014, event summarizing the cause of the release and the actions taken to remediate the issue.

The release was caused by a failed seal on a gas extraction well and a malfunctioning leachate extraction pump. These equipment failures allowed the release of a limited amount of leachate from the collection system. As soon as the release was identified, the area was isolated through gate closure to prevent further release and allow necessary repairs. As noted in MDNR's Area of Concern, the leachate was contained within the lined ditch system. A spill contractor was mobilized to vacuum the leachate and any storm water that had contacted the leachate from the lined ditch. The ditch was then flushed and vacuumed to ensure all leachate was captured. The leachate and washwater was collected and placed into the onsite leachate treatment process for handling and disposal in accordance with approved leachate treatment protocols.

The leachate was able to be contained and promptly remediated due to the extensive containment and stormwater management system upgrades that have been implemented during the last year. In order to ensure proper collection and detention of the increased storm water flow from the impermeable cap, Bridgeton Landfill constructed a new sedimentation basin. Consistent with the directives of the MDNR Letter of Warning, Bridgeton Landfill has submitted an application to move the Outfall 003 to the outfall of that basin. Utilization of the sedimentation basin will help ensure that the increased surface water flow from the impermeable cap does not result in exceedences of storm water discharge limits.

In order to prevent leachate or leachate contaminated stormwater from reaching that unlined sedimentation basin, Bridgeton Landfill has installed gates to control flow into the basin. Those gates were successful in containing the February 9th release on site. To allow for prompt and thorough containment and cleanup of any leachate releases, Bridgeton Landfill has lined the onsite drainage system. This allows leachate and leachate contaminated stormwater to be efficiently removed and impacted drainage basins thoroughly flushed in order to ensure that spills are fully remediated and stormwater is not impacted.

Bridgeton Landfill will also continue its ongoing operations and maintenance work in order to monitor and maintain the substantial amount of collection infrastructure within the landfill. Recent upgrades, including the new leachate forcemain, have helped to alleviate pressure on a number of collection points and should help avoid some of the malfunctions like those that caused the February 9th release. However with the extensive amount of infrastructure currently in operation at Bridgeton Landfill, prompt and effective response and containment practices like those developed and implemented over the last year will continue to be critical to compliant operation.