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Date: June 27, 2023
Refer To: N3B-2023-0192

Ricardo Maestas, Acting Bureau Chief
 Hazardous Waste Bureau
 New Mexico Environment Department
 2905 Rodeo Park Drive East, Building 1
 Santa Fe, NM 87505-6313

Subject: Request to Reduce Frequency of Monitoring for the Los Alamos County Airport Landfill Cover System, Solid Waste Management Units 73-001(a,d) in Technical Area 73

- References:
1. U.S. Department of Energy 2017. "Long-Term Monitoring Plan, Los Alamos County Airport Landfill Cover Replacement, Solid Waste Management Units 73-001(a,d), Technical Area 73," report prepared by Dwyer Engineering, LLC, for DOE Environmental Management Los Alamos Field Office, Los Alamos, New Mexico (March 2017)
 2. New Mexico Environment Department 2017. "Approval, Long-Term Monitoring Plan for the Los Alamos County Airport Landfill Cover Replacement, Solid Waste Management Units 73 001(a,d) Technical Area 73, Los Alamos National Laboratory," New Mexico Environment Department letter to D. Hintze (EM-LA) from J.E. Kieling (NMED-HWB) (March 30, 2017)
 3. U.S. Department of Energy and Los Alamos County 2008. "Parcel A-4 Quitclaim Deed," Los Alamos, New Mexico (October 20, 2008)

Dear Mr. Maestas:

Newport News Nuclear BWXT-Los Alamos, LLC (N3B) and the U.S. Department of Energy (DOE) Environmental Management Field Office (EM-LA) are submitting this letter to request a reduction in the frequency of monitoring at the Los Alamos County (LAC) Airport Landfill cover system, Solid Waste Management Units 73-001(a,d) at Technical Area 73. This request is being submitted pursuant to the approved "Long-Term Monitoring Plan for Los Alamos County Landfill Cover Replacement Solid Waste Management Units 73-001(a,d) Technical Area 73" (hereafter referred to as the Long-Term Monitoring Plan"; References 1 and 2). Specifically, N3B and EM-LA request approval to transition from quarterly inspections to semiannual inspections. In addition, N3B and EM-LA is providing a summary of the monitoring requirements, the cover performance criteria, and the performance success of the landfill cover system below.

Introduction

The LAC Airport Landfill operated from 1943 to 1973 for the disposal of solid waste consisting of household trash from the Los Alamos townsite and office trash from Los Alamos Scientific Laboratory. From 1984 to 1986, wastes were excavated from the western portion of the LAC Airport Landfill and placed in the debris disposal area (DDA), located east of the landfill. The land inclusive of the landfill was transferred by DOE to LAC in 2002 (Reference 3). However, maintenance of the landfill remains the responsibility of DOE.

Installation of an engineered soil cover system was completed in 2016. The soil cover was designed as a source migration control system to isolate the waste from meteoric water and minimize the potential for contamination of groundwater or surface water. The design minimizes net percolation of water into the waste by storing precipitation within the upper portion of the cover for a period sufficient to allow evaporation and transpiration to remove the water. These cover systems are called store and release, or evapotranspiration (ET) cover systems and have been shown to be highly effective in the semiarid climate of New Mexico.

The ET cover at the LAC Airport Landfill consists of a three-layer soil system with a total thickness of 3 ft. The top layer of the cover consists of a 6-in.-thick, non-compacted mixture of 25% gravel and 75% sandy loam soil. The top layer allows for rapid surface infiltration of incident precipitation while minimizing runoff and any associated erosion. The middle layer is a 1.5-ft-thick layer of compacted native soil with a high water storage capacity. The function of this layer is to store water and to promote vegetative growth. The basal layer consists of a 1-ft-thick compacted soil/clay material. Any water that infiltrates to this depth is retarded by the lower hydraulic conductivity of the soil and, subsequently, through evaporation and transpiration, returns to the atmosphere. The cover system is instrumented with soil moisture probes that monitor the soil and are used to calculate flux. Methane monitoring stations are incorporated into the cover in order to determine whether the quantity of moisture penetrating the cover can induce biodegradation of the underlying organic waste.

Monitoring Requirements

Section 4.0 of the approved Long-Term Monitoring Plan (References 1 and 2) describes the required monitoring and reporting elements as follows:

- ET cover system
 - ❖ Water balance
 - ❖ Methane
 - ❖ Biological intrusion
 - ❖ Vegetation
- Stormwater control system
- Fencing
- Retaining walls
- Erosion and sedimentation control measures
- Site access

N3B and EM-LA intend to continue semiannual and storm-event-driven inspections for all elements listed above, including water balance monitoring. The Long-Term Monitoring Plan suggests that water balance monitoring be discontinued after the 5-yr monitoring period (Section 2.0, p. 4); however, N3B and EM-LA find value in continuing the data collection. N3B and EM-LA propose that the water balance data be downloaded and evaluated semiannually and reported in the annual report to the New Mexico Environment Department (NMED).

Methane Monitoring: The Long-Term Monitoring Plan also specifies that methane monitoring be performed quarterly for the first 2 yr of long-term monitoring and that the frequency could be reduced to semiannually if the levels of methane recorded have been below 25% of the lower explosive limit (LEL). Quarterly methane measurements were collected for 3 yr, and all were 0% of LEL. The monitoring frequency was reduced to semiannual during the fourth year of monitoring, and levels remained at 0% of LEL. In addition, the Long-Term Monitoring Plan allowed for a further reduction to annual methane monitoring given the methane levels remained below 25% of the LEL. Accordingly, N3B and EM-LA have reduced the frequency of methane monitoring and reporting to annually.

ET Cover Performance Criteria and Success

The criteria for successful performance of the ET cover system at the LAC Airport Landfill are as follows:

1. *ET cover system:*
 - **Vegetation:** inspect vegetation based on type of vegetation, percent of bare area, and size of native vegetation seeded during the cover installation
 - **Water balance:** minimize the potential for meteoric water to enter the waste
 - **Ponding:** minimize differential settlement and maintain positive drainage
2. *Stormwater control system:* Maintain overall integrity of the systems to facilitate effectively routing water off the cover and to ensure minimal percolation through the cover into the waste.
3. *Fencing:* Maintain the integrity of all fencing adjacent to the northern and northeastern perimeters of the landfill. Site access must be available for any required maintenance or repairs that are noted during the scheduled inspections.
4. *Retaining walls:* Maintain the integrity of the eastern retaining walls.
5. *Erosion and sedimentation control measures:* Maintain the integrity of the erosion control structures as well as the overall integrity of the cover on the top slope and side slopes system.
6. *Methane monitoring:* Immediately take all necessary steps to ensure protection of public health, welfare, and the environment and notify NMED. Within 7 days of detection, record the methane gas levels detected and prepare a description of the steps taken to protect public health, welfare, and the environment and report them to NMED.

Results

The general integrity of the ET cover system has been inspected and documented during each quarterly inspection since installation. The top slope and side slopes of the landfill were examined for degradation of the cover system such as erosion (as evidenced by rilling or gullyng), quality and quantity of vegetation established, areas of subsidence, biological intrusion, cracking, slope instability, and wet areas.

- The overall water balance data show that the landfill appears to be drying with an upward trend in matric potential in the cover system.
- The water balance data reveal that moisture infiltrates the cover profile after precipitation events and quickly evaporates to the atmosphere.
- Stormwater controls are effective and show no signs of blowout or degradation.
- The fencing is complete and continuous. Site access is effectively controlled by the airport fencing and locked access.
- With the exception of the development of a tension crack due to settlement on the north-central area of the landfill, the cover system was found to be in excellent condition with no signs of degradation. The tension crack was repaired and has shown no signs of redeveloping.
- No significant erosion or differential settlement resulting in ponding, significant biological intrusion, or other issues were identified.
- The eastern and northern slopes are stable, and erosional rills are healed.
- Vegetation in seeded areas of the cover system was inspected and determined to be successful based on type of vegetation, approximate surface coverage based on visual observation, and size of native vegetation seeded during the cover installation. Healthy vegetation has uniformly and heartily emerged across the entire landfill.
- The DDA cover has not degraded and has healthy vegetation growth.
- Methane was not detected during monitoring.

Based on the performance criteria and results above, the landfill cover and related appurtenances have functioned as planned and in conformance with the objectives stated in the Long-Term Monitoring Plan. Accordingly, N3B and EM-LA respectfully request NMED's concurrence to reduce the inspection frequency of the cover and related appurtenances to a semiannual basis.

If you have any questions, please contact David Diehl at (505) 551-2496 (david.diehl@em-la.doe.gov) or Cheryl Rodriguez at (505) 414-0450 (cheryl.rodriguez@em.doe.gov).

Sincerely,



Troy Thomson
Program Manager
Environmental Remediation
N3B-Los Alamos

Sincerely,

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Arturo Q. Duran
Office of Quality and Regulatory Compliance
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