

**Attachment O**

**Closure Plan**



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## **Attachment O**

### **Closure Plan**

#### **1 CLOSURE OF PERMITTED UNIT**

This closure plan describes specific activities required for closure of the landfill. The closure activities are designed to minimize the need for further maintenance and any potential impacts to human health and the environment. Closure activities are described in Section 1.1. Section 3 presents the closure performance standard and Permit Attachment O1, Compliance Schedule for Closure, discusses the closure schedule. Closure certification and modifications are discussed in Section 4 and Section 5, respectively. Closure cost estimates and compliance with financial assurance requirements are discussed in Permit Attachments O2, Financial Assurance for Closure, and P1, Financial Assurance for Post-Closure Care.

##### **1.1 Closure Activities**

At the end of the active life of the Facility, the landfill and all structures of the Facility will be closed and dismantled, respectively, in compliance with 40 CFR § 264, Subpart G. Any solid hazardous waste and debris will be placed in the landfill, and non-hazardous waste will be sent off site for reuse, recycle, or disposal in compliance with 40 CFR § 264, Subpart G. Liquids generated during closure (decontamination solutions and leachates) shall be shipped off site for appropriate treatment and disposal. The landfill shall be capped with a final cover, and post-closure care shall be initiated for the landfill. These closure activities are described in detail in the following sections.

An off-site laboratory shall be used for analysis of hazardous waste and samples of environmental media at closure. The off-site laboratory shall be a U.S. Environmental Protection Agency (EPA) approved laboratory with an internal quality control/quality assurance (QA/QC) program and specific procedures for each analytical method. All laboratory samples will be analyzed for the hazardous constituents specified in 40 CFR § 261, Appendix VIII and all other constituents considered by the New Mexico Environment Department (NMED) to be a threat to human health and the environment.

Prior to the commencement of closure activities, the owner shall notify the NMED in writing at least 60 days prior to the expected start of closure. The schedule for closure is described in more detail in Permit Attachment O1, Compliance Schedule for Closure.

##### **1.1.1 Landfill**

Appropriate closure of the landfill shall be ensured by the development of a sampling and analysis plan (SAP). The plan will be submitted to the NMED for review and approval no less than 360 days prior to implementation. At a minimum, it will specify the following aspects of the sampling and analysis activities:

## 1.0 Sampling Program

- 1.1 Sampling Locations
- 1.2 Sample Matrix
- 1.3 Sample Containers, Type and Size
- 1.4 Sampling Tools
- 1.5 Sample Collection Methods
- 1.6 Sample Management
- 1.7 Field Screening Methods

## 2.0 Analytical Methods

- 2.1 Analytes for Analysis
- 2.2 Analysis Procedures (Specified SW-846 Methods)

## 3.0 Quality Assurance

- 3.1 Organization
- 3.2 Sample Management
- 3.3 Analytical System
  - 3.3.1 Instrument Maintenance
  - 3.3.2 Instrument Calibration
  - 3.3.3 Personnel Training
  - 3.3.4 Reagents and Standards
  - 3.3.5 Corrective Actions
- 3.4 Data Quality Objectives
- 3.5 Performance and System Audits

## 4.0 Data Management

- 4.1 Data Collection
- 4.2 Data Reduction
- 4.3 Data Reporting

The SAP shall specify the use of equipment, methods, and techniques current at the time the plan is prepared. Applicable provisions of the most-current version of SW-846 (or other applicable standard reference then in effect) shall be specified. Applicable reporting requirements also shall be specified, as appropriate.

This Part B Permit Application only includes the Phase 1A portion of the landfill. Therefore, this Closure Plan only addresses Phase 1A. If future expansions are required, the expansions will be addressed in future permit modifications and will include revised closure plans.

At closure of the landfill, a final cover shall be constructed with a permeability that is less than or equal to the permeability of the bottom liner. Drawing 11 (Permit Attachment L1) includes a reference to “vegetative cover” shown just above the original land surface. This depicts final cover in the event that the landfill is closed after Phase 1A. A geosynthetic liner would be placed on top of the waste as it existed at closure, then the remaining “open air space” would be backfilled to grade, and the final cover would be installed as shown. Specifications and a slope stability analysis for this liner shall be provided in a revised closure plan in the event that the Facility is closed during Phase 1A operations. The final cover shall consist of a three-layer cap design consisting of a vegetative cover, a geocomposite drainage layer, and a geomembrane and geosynthetic clay liner (GCL) barrier layer over a prepared subgrade, as described in Permit Attachment L, Engineering Report, Section 3.1.6, Final Cover. The final cover shall meet the following requirements:

- i. The vegetative cover shall have a minimum thickness of 2.5 feet and final upper slopes of between 3 and 5 percent after settlement and subsidence of the waste. Native grasses shall be planted.
- ii. The drainage layer shall have a transmissivity of greater than or equal to  $2.2 \times 10^{-4}$  square meters per second ( $m^2/s$ ) and consist of a high-density polyethylene (HDPE) geonet sandwiched between two geotextile layers (generally referred to as a geocomposite) and shall be designed to allow lateral flow and discharge of liquids.
- iii. The bottom layer shall consist of a 60-mil HDPE geomembrane layer and GCL with permeability of less than or equal to  $5 \times 10^{-9}$  centimeters per second (cm/s) underlain by 6 inches of prepared subgrade and 1.5 feet of protective soil.
- iv. The cover shall be designed to function with minimum maintenance, including minimal erosion. The vegetative cover shall be designed with a surface drainage system capable of conducting runoff across the cap without forming rills and gullies.

In addition, remaining water in the contaminated water basin (as shown in Drawing 10, Filling Plan – Phase 1A) that cannot be eliminated through evaporation shall be removed, tested, and properly disposed. Then, the contaminated water basin shall be filled with soil to mitigate potential post-closure accumulation of water, and the cover shall be constructed across this area. This shall ensure that all lined areas of the landfill are covered. These details shall be included in an updated closure plan in the event that the facility is closed during Phase 1A operations.

Prior to closure of the landfill, an assessment shall be made of the landfill waste gas generating potential. This will be made from the quarterly landfill monitoring data that shall be collected over the life of the landfill. Following closure, if it is concluded that gas generation may result in gas build-up beneath the barrier layer of the cover or releases that exceed regulatory air quality standards, then provisions shall be made to collect and monitor gas generation and release during the post-closure period. If this occurs, the best available technology shall be implemented into

the construction of the cover system. In this case, the NMED shall be informed and shall approve a monitoring plan and any changes in the construction of the cover system.

Any leachate from the landfill shall be pumped from the primary and secondary collection systems and, if detected, from the vadose zone monitoring sump throughout the closure period and shall continue throughout post-closure care. The leachate shall be collected, sampled, and managed as hazardous waste, as appropriate. The leachate shall be collected at a frequency appropriate to the rate at which it collects in the sump. As indicated in Permit Attachment P, Post-Closure Care, the collection sump shall be inspected monthly until the sump remains dry for six months. Thereafter, the sump shall be inspected semi-annually. Details of the leachate sampling and analysis program will be specified in a SAP.

Before the landfill cap is completed, soil samples shall be collected from outside the perimeter of the landfill cap to determine if any soil contamination is present. The sampling locations shall primarily correspond to the transportation corridor used by waste hauling trucks during the active life of the landfill. In addition, samples shall be collected at the landfill stormwater retention basin and within ditches directing flow to the basin.

It is proposed that individual samples be obtained along the haul roads at 100-foot intervals and at locations where visible staining is observed. Because the stormwater detention basin (Drawing 25, Surface Water Control Features) is lined with a geomembrane, individual samples shall be collected from beneath the geomembrane and its associated drainage ditches at a frequency equivalent to one per 10,000 square feet over the entire area (i.e., one sample to be taken at the center of each 10,000-square-foot grid). However, if the liner in the stormwater runoff basin is observed to be damaged, additional sampling shall be required. Sample results shall be compared against the closure performance standards presented in Section 2. If any contaminated materials are identified they shall be excavated and removed to the landfill prior to placement of the final cover.

No later than the submission of the certification of closure of the landfill in compliance with 40 CFR § 264.115, the Facility shall submit to the local zoning authority and to the NMED a survey plat indicating the location and dimensions of the landfill with respect to permanently surveyed benchmarks in compliance with 40 CFR § 264.116. This plat shall be prepared and certified by a professional land surveyor. The survey plat shall contain a prominent note that asserts the Facility's obligation to restrict disturbance of the hazardous waste disposal unit. The Facility also shall record a notation on the deed to the Facility property in compliance with 40 CFR § 264.119(b)(1) to notify any potential purchasers of the property that (1) the land has been used to manage hazardous wastes; (2) use of the land is restricted to activities that will not disturb integrity of the final cover system or monitoring system during the post-closure care period; and (3) the survey plat and record of waste disposal have been submitted to the local zoning authority and to the NMED.

A record of the type, location, and quantity of hazardous wastes disposed of within the disposal unit shall be submitted to the local zoning authority and to the NMED no later than 60 days after certification of closure of the landfill in compliance with 40 CFR § 264.119(a).

The vadose zone monitoring wells shall be sampled and analyzed in accordance with the procedures that are presented in Permit Attachment I, Vadose Zone Monitoring System Work Plan. The frequency of sampling and parameters to be tested are outlined in Permit Attachment I.

### **1.1.2 Closure of Non-Permitted Units**

Other areas within the Facility boundary, which have the potential to become Solid Waste Management Units during the operational life of the Facility, shall be closed in accordance with the requirements of the closure SAP. Those non-waste management units, such as the maintenance shop and the stormwater detention basin, shall be sampled to verify the absence of contamination prior to closure and removal. Any accumulated stormwater shall be evaporated from these areas. If the non-waste management unit structures or liners display any evidence of contamination, they shall be managed in accordance with the requirements of this closure plan. If contamination is not present they shall be disposed of as solid waste. The stormwater detention basin and stormwater ditches shall remain in place.

After removal of the structures, other appurtenances, and liner materials, the areas shall be contoured and revegetated as necessary.

## **2 CLOSURE PERFORMANCE STANDARD**

The RCRA closure performance standard (40 CFR § 264.111) specifies that hazardous waste facilities are to be closed in such a way as to minimize the need for further maintenance at the Facility and protect human health and the environment by controlling, minimizing, or eliminating potential releases of hazardous waste to the environment. The Facility shall meet a clean-closure performance standard for all non-waste management units except the landfill and shall not impact any environmental media in excess of NMED-approved background levels or pose a threat to human health or the environment. The landfill cannot be clean-closed; therefore, the Facility-specific, clean-closure performance standard is not applicable.

Indicator parameters shall be selected and approved by NMED at closure. These parameters shall be representative of the wastes disposed of during the Facility operating life. The waste information used to make these selections will be based upon the Facility operating record. For soil, analytical results that indicate that concentrations of contaminants of concern are within a statistically significant range relative to clean background soil as determined by NMED will constitute demonstration of clean closure. Clean background samples shall be obtained from the alluvium unit and from the Upper and Lower Dockum units from each of the vadose zone monitoring well borings, for a total of 15 background samples per stratigraphic unit. If the

alluvium is not present at a specific vadose zone monitoring well boring location, a surface sample from the southern portion of the site shall be substituted for the sample. Each sample shall be submitted to an analytical laboratory for chemical analysis of metals listed in 40 CFR § 264, Appendix VIII, using EPA SW-846 analytical methods or equivalent methods approved by NMED.

### **3 CERTIFICATION OF CLOSURE**

Within 60 days of completion of closure, the Facility shall submit to NMED a closure report and a certification that the hazardous waste management unit has been closed in accordance with the approved closure plan in compliance with 40 CFR § 264.115. The closure report and the certification shall be signed by the owner/operator and by an independent New Mexico registered professional engineer.

### **4 MODIFICATIONS TO THE CLOSURE PLAN**

This closure plan shall be amended no less than 60 days prior to implementation of any changes in operating plans or Facility design. While conducting partial or final closure activities, unexpected events may be identified that also require amendment of the approved closure plan. Requests for modification shall be made no less than 30 days after identifying an event that justifies plan modification.