

## CHAPTER 9

**CLOSURE AND POST-CLOSURE PLANS****9-1. Introduction**

a. Subpart G of 40 CFR 264 establishes performance standards that must be met by individual hazardous waste treatment, storage or disposal facilities to extend protection of human health and the environment beyond the active life of the facility. These closure and post-closure standards are the basis for written plans that the facility owner or operator must prepare, amend as necessary, and submit with the permit application. Approval of the designated closure procedures and, where applicable, post-closure plans is a condition of facility operation.

b. The plan must identify the steps necessary to close or partially close the facility at any point during its intended operating life, and to completely close it at the end of its intended life. Copies of the closure and post-closure plans must be kept at the facility and revised whenever changes in the operating plans or facility design affect the closure or post-closure procedures, or whenever the anticipated year of closure changes.

**9-2. Closure Procedures**

a. Each hazardous waste management unit must be closed in a manner that minimizes the need for further maintenance, particularly with respect to escape of hazardous waste, leachate, contaminated rainfall or waste constituents to ground water, surface water, soil or the atmosphere. The owner or operator and a certified engineer should certify that the land disposal/land treatment facility has been closed in accordance with the approved closure plan. Closure procedures for each disposal mode are summarized below.

b. Landfill closure is achieved by installing a final cover which has a permeability less than or equal to that of the bottom liner. The cover should be capable of (1) minimizing infiltration of liquids, (2) functioning with minimum maintenance, (3) promoting drainage and minimizing erosion of cover, and (4) accommodating settling and subsidence.

c. Surface impoundments can be closed in one of two ways:

(1) Removing or decontaminating all wastes, waste residues, system components (such as liners), subsoils and structures or equipment. No post-closure care is required as long as removal or decontamination is complete.

(2) Removing liquid waste or solidifying the remaining waste. A final cover must be placed over the impoundments closed by solidification. Post-closure care of such impoundments will consist of monitoring ground water and conducting corrective action if it is

warranted (see para 8-5), and maintaining the effectiveness of the final cover. For double-lined disposal units, the leak detection system must be monitored as part of post-closure care.

d. Closure of a land treatment unit may be accomplished by either (1) establishing a permanent vegetative cover capable of maintaining growth without extensive maintenance, (2) removing and landfilling the zone of incorporation, or (3) capping the land treatment area to control wind and water erosion. General closure practices called for include minimizing run off from the treatment zone, continuing ground-water monitoring, and continuing restrictions on food-chain crops. In addition, the unsaturated zone should be monitored as part of the closure procedures; however, soil-pore liquid monitoring may be suspended 90 days after the last application of waste at the unit. Each of these practices is described in chapter 12 of EPA SW-874.

e. Closure requirements for waste piles are less stringent than those for facilities such as landfills since waste piles cannot be used for permanent disposal. The principal closure requirement for a waste pile that has achieved adequate waste containment during its active life is removal or decontamination of all waste and waste residue, and all system components (e.g., liners), subsoils, structures and equipment which have been contaminated by contact with the waste. However, if contamination of the subsoils is so extensive as to preclude complete removal or decontamination, the closure and post-closure requirements applying to landfills must be observed. Ensuring adequate containment of waste should therefore be an important consideration in initial design of a waste pile.

**9-3. Components of closure plan**

a. The components of the closure plan summarized below apply to all hazardous waste disposal facilities, as well as to storage facilities, i.e., those from which the wastes will be removed at closure. In addition to the general requirements, there are special provisions for the different types of hazardous waste land treatment and disposal facilities. Specific procedures to be followed in closure of hazardous waste landfills, waste piles, surface impoundments and land treatment units are contained in chapter 5.

b. At a minimum, the closure plan for all facilities must include the following elements:

(1) Procedures for partial and final closure: partial closure may involve closing part of a unit, such as a landfill cell, while other parts of the same facility continue to operate.

- (2) Estimated date(s) of partial closure.
- (3) The maximum extent of the operation that will remain open during the life of the facility.
- (4) Estimates of the maximum waste inventory in storage and in treatment at any time during the life of the facility.
- (5) Procedures to decontaminate equipment during closure.
- (6) Estimated year of final closure.
- (7) Schedule to close facility allowing 90 days after final volume of wastes is received for treatment, removal or onsite disposal. Closure must be completed within 180 days of receipt of last volume of wastes.
- (8) Procedure for updating the closure plan.

**9-4. Post-closure plans**

a. Post-closure plans must be prepared for all disposal facilities that will contain hazardous wastes after closure. Surface impoundments permitted for storage, i.e., those from which all wastes are to be removed at closure, must have not only a closure plan for waste removal, but also contingency closure and post-closure plans to close the unit as a landfill, should complete waste removal not be possible. Likewise, if decontamination of a waste pile cannot be completed at closure by removing the waste, waste residues, contaminated subsoils, structures and equipment, landfill closure and post-closure requirements will apply.

b. The post-closure plan for a hazardous waste disposal unit or facility describes the owner or operator’s responsibilities for maintaining the environmental protection and physical security of the site for 30 years after closure. The deed of the property, or other document that would be examined during a title search, must alert any potential purchaser that the land has been used to manage hazardous wastes. The deed must notify the purchaser that post-closure use must not disturb the protective features of the site such as the liner, cap, or monitoring systems. Any variation from this standard requires approval of the

EPA administrator or authorized state department.

c. The 30-year post-closure period may be reduced if the owner or operator demonstrates that a shorter 1 time period will be sufficient to protect human health and the environment. Conversely, the period may be extended if, for example, groundwater monitoring data indicate a potential for harmful migration of wastes.

d. The actual contents of the post-closure plan will vary with each site to reflect the degree and type of maintenance dictated by the facility life, the closure procedures, and the site’s design. For most units, the post-closure plan will include activities in two principal categories: (1) ground-water monitoring, and (2) maintenance activities. Components of these plans are summarized below.

- Ground-Water Monitoring
  - Include a copy of ground-water monitoring and analysis plan
  - Indicate: (a) number, location and depth of wells to be monitored during post closure, (b) frequency of monitoring, and (c) monitoring procedures and analyses
- Maintenance Activities
  - Facility inspection schedule
  - Care of cover and/or vegetation
  - Erosion control activities
  - Maintenance of ground-water monitoring
  - Collection and disposal of leachate
  - Maintenance of gas control system
  - Care of security systems
  - Response to unplanned events such as severe storm erosion, drainage failure, drought or other occurrence that could threaten facility integrity

Within 90 days after closure is completed, a survey plat indicating the location and dimension of landfill cells or other disposal areas, must be submitted to the EPA administrator and the local zoning authority or the authority with jurisdiction over local land use.