

ATTACHMENT H
POST-CLOSURE PLAN

Waste Isolation Pilot Plant
Hazardous Waste Permit

| January 2016 ~~November 30, 2010~~

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1 **ATTACHMENT H**

2 **POST-CLOSURE PLAN**

3 Introduction

4 This Permit Attachment contains the Post-Closure Plan, which describes activities required to
5 maintain the Waste Isolation Pilot Plant (**WIPP**) after completion of facility closure. Since the
6 current plans for operations extend over several decades, the Permittees will periodically
7 reapply for an operating permit in accordance with 20.4.1.900 NMAC (incorporating 40 CFR
8 §270.10(h)).

9 This plan was submitted to the New Mexico Environment Department (**NMED**) in accordance
10 with 20.4.1.900 NMAC (incorporating 40 CFR §270.14(b)(13)) and the U.S. Environmental
11 Protection Agency (**EPA**). The Post-Closure Plan includes the implementation of institutional
12 controls to limit access and groundwater monitoring to assess disposal system performance.
13 Until final closure is complete and has been certified in accordance with 20.4.1.500 NMAC
14 (incorporating 40 CFR §264.115), a copy of the approved Post-Closure Plan and all approved
15 revisions will be on file at the WIPP facility and will be available to the Secretary of the NMED or
16 the EPA Region VI Administrator upon request.

17 H-1 Post-Closure Plan

18 The post-closure care period begins after completion of closure of the first underground
19 hazardous waste disposal unit (**HWDU**) and continues for 30 years after final closure of the
20 facility. The post-closure care period may be shortened or lengthened by the Secretary of the
21 NMED, based on evidence that human health and the environment are being protected or are at
22 risk. During the post-closure period, the WIPP shall be maintained in a manner that complies
23 with the environmental performance standards applicable to the facility. During this period, the
24 Permittees will employ active institutional controls as necessary.

25 This post-closure plan focuses on activities following final facility closure. However, some
26 discussion of post-closure following panel closure is warranted since some panel closures will
27 occur long before final facility closure. As discussed in Attachment G (Closure Plan), Section G-
28 1e(1), panel closures have been designed to require no post-closure maintenance. The
29 Permittees have defined a post-closure care program for closed panels that has three aspects.
30 These are routine inspection of the openings in the vicinity of the closures, the sampling of
31 ventilation air for harmful constituents, and a Volatile Organic Compound Monitoring Program.
32 The rules of the Mine Safety Health Administration drive the implementation of the first two
33 programs. These rules require that underground mines monitor air quality to assure good
34 breathing air whenever personnel are underground and that mine operators provide safe ground
35 conditions for personnel in areas that require access. Routine monitoring of the openings in the
36 access ways to panels will be continued and these openings will be maintained for as long as
37 access into them is needed. This includes continued reading of installed geomechanical
38 instrumentation, sounding the areas, visual inspection and maintenance activities such as
39 scaling, mining, or bolting as required and as described in Permit Attachment A2. In addition, all
40 areas in the underground that are occupied by personnel are checked prior to each day's work
41 activities for accumulations of harmful gases, including methane. Action levels for increasing

1 ventilation to areas that show high levels of harmful gases are specified as described in Permit
2 Attachment D.

3 These monitoring programs will be carried out during the period between the closure of the first
4 panel and the initiation of final facility closure for the underground facility. The Permittees have
5 prepared a Volatile Organic Compound Monitoring Plan (VOCMP) which will be implemented to
6 confirm that the annual average concentration of volatile organic compounds (VOCs) in the air
7 emissions from the underground HWDUs do not exceed the VOC action levels (10^{-5} for
8 carcinogens and HI>1 for non-carcinogens) concentrations of concern listed in Permit Part 4,
9 Section 4.6.2.3 and Permit Attachment N, Table N-3.1. The VOCMP is provided in Attachment
10 N. The VOCMP includes monitoring design, sampling and analysis procedures and quality
11 assurance objectives. This plan is required to demonstrate compliance with 20.4.1.500 and .900
12 NMAC (incorporating 40 CFR §264.602 and §270.23(a)(2)).

13 The Permittees will operate in accordance with the VOCMP ~~collect air samples upstream of all~~
14 ~~open and closed panels, and down stream of Panel 1~~ until after certification of the closure of the
15 last underground HWDU.

16 The VOCMP uses EPA Compendium Method TO-15. The Permittees have had success with
17 TO-15 at the WIPP if care is taken in placing the sampler to avoid high dust and if stringent
18 cleaning requirements are imposed for the clean canisters. This is necessary because of the
19 extremely low concentrations that are being monitored.

20 The VOCMP will be implemented under a Quality Assurance Plan that conforms to the
21 document entitled "EPA Requirements for Quality Assurance Project Plans for Environmental
22 Data Operations.". Quality Assurance criteria required for the target analytes are presented in
23 Table N-42 in Permit Attachment N. Definitions of these criteria are given in Permit Attachment
24 N along with a discussion of other requirements of the Quality Assurance Program, including
25 sample handling, calibration, analytical procedures, data reduction, validation and reporting,
26 performance and system audits, preventive maintenance, and corrective actions.

27 H-1a Post-Closure Plan after Final Facility Closure

28 A number of regulations deal with the period of time that begins once the WIPP has undergone
29 final facility closure and decommissioning. Under 40 CFR Part 191, the period consists of an
30 active control period and a passive control period; only 100 years of the active control period
31 can be used in performance assessment. The Land Withdrawal Act (LWA) of 1992 requires that
32 the U.S. Department of Energy (DOE) prepare and submit a post-decommissioning land
33 management plan. 20.4.1.500 NMAC (incorporating 40 CFR §264.117) requires post-closure
34 care, including monitoring, security, and control of property use. Because of the numerous
35 regulations, the Permittees have prepared a single strategy for post-closure management of the
36 WIPP. This strategy consists of three elements: 1) active controls, 2) monitoring, and 3) passive
37 controls. Only the first and second elements occur within the post-closure period covered by this
38 permit.

39 H-1a(1) Active Institutional Controls

40 Once a facility is decommissioned, positive actions (referred to as "active institutional controls")
41 will be taken to assure proper maintenance and monitoring. The EPA, in 40 CFR §191.14(a)
42 has specified that active controls will be maintained for as long as practicable and that no more

1 than 100 years of active institutional control can be assumed in predictions of long-term
2 performance. This assumption assures that future protection and control does not rely on
3 positive actions by future generations.

4 The Permittees' active institutional control program has a primary objective of addressing all
5 applicable requirements, including restoring the WIPP site as nearly as possible to its original
6 condition, and thereby equalizing any preference over other areas for development by humans
7 in the future. Restoration of the WIPP site includes any necessary remedial actions or cleanup
8 of releases resulting from decommissioning. In addition, as part of the active institutional control
9 program implemented under 40 CFR §194.14(a), the Permittees will implement monitoring
10 systems suitable for assessing disposal system performance if such monitoring is feasible.

11 The Permittees will implement the active institutional control program as described in more
12 detail below:

13 Identification of Active Institutional Control Measures

14 A detailed explanation of the active institutional controls selected by the Permittees as part of
15 this first step is provided in Permit Attachment H1 (WIPP Active Institutional Controls). This is
16 the Permittees' reference design for active institutional controls. The reference design will be
17 reviewed periodically and updated by the Permittees as appropriate during WIPP disposal
18 operations. The ongoing review and evaluation ensure that the active institutional controls
19 implemented are appropriate for the conditions that may exist at that time. The Permittees will
20 review the reference design prior to implementation and all affected regulatory agencies will be
21 consulted as part of this review. If updating the reference design proposes any changes in the
22 Post-Closure Plan as described in this permit, the Permittees shall apply for a permit
23 modification to include those changes, or submit the reference design and revised Post-Closure
24 Plan as part of a routine permit renewal application, as required by 20.4.1.500 NMAC
25 (incorporating 40 CFR §264.118(d)).

26 As part of the active institutional controls program, the Permittees have developed a set of
27 active institutional controls which will be implemented. These are as follows:

- 28 • A fence line shall be established to control access to the repository's footprint area (the
29 waste disposal area projected to the surface). A standard wire fence shall be erected
30 along the perimeter of the repository surface footprint. The fence shall have gates
31 placed approximately midway along each of the four sides.
- 32 • An unpaved roadway along the perimeter of the barbed wire fence shall be
33 constructed to provide ready vehicle access to any point around the fenced perimeter,
34 to facilitate inspection and maintenance of the fence line, and to permit visual
35 observation of the repository footprint to the extent permitted by the lay of the land.
36 This roadway shall connect to the paved south access road.
- 37 • To ensure visual notification, the fence line shall be posted with signs having as a
38 minimum, a legend reading "Danger—Unauthorized Personnel Keep Out" and a
39 warning against entering the area without specific permission of the Permittees.
- 40 • Contractual arrangements shall be developed to ensure that periodic inspection and
41 necessary corrective maintenance is conducted on the fence line, its associated

1 warning signs, and the roadway. The Permittees will maintain control over all
2 contractual work and will maintain, in the operating record, the results of all inspections
3 and maintenance activities.

- 4 • Through direct Permittee staffing support and/or contractual arrangements, procedures
5 shall be established to provide routine periodic patrols and surveillances of the
6 protected area by personnel trained in security surveillance and investigation.
- 7 • Mitigating actions will be taken to address any abnormal conditions¹ identified during
8 periodic surveillance and inspections.
- 9 • Reports of activities associated with the post-disposal active access controls shall be
10 prepared in accordance with regulatory requirements for submittal to the appropriate
11 regulatory and legislative authority.

12 Details on meeting these criteria are found in Permit Attachment H1.

13 Preparation of a Post-Decommissioning Land Management Plan

14 Section 13(b) of the LWA requires the DOE to prepare and submit a plan for managing the land
15 withdrawal area after decommissioning the WIPP facility. This plan will include a description of
16 both the active and passive institutional controls that will be imposed after decommissioning is
17 complete. This plan will be prepared in consultation with the Department of Interior and the state
18 of New Mexico. If the land management plan proposes any changes in the Post-Closure Plan as
19 described in this permit, the Permittees shall apply for a permit modification to include those
20 changes, or submit the land management plan and revised Post-Closure Plan as part of a
21 routine permit renewal application, as required by 20.4.1.500 NMAC (incorporating 40 CFR
22 §264.118(d)).

23 Preparation of the Active Institutional Control Plan

24 An active institutional control plan will be initiated prior to actual plant closure, and will contain
25 all the information needed to implement the active and passive institutional controls for the
26 WIPP facility. Active institutional control planning will be based on the reference design and will
27 take into account the most current information regarding the facility and its vicinity and will make
28 use of state-of-the-art materials and techniques. This plan will include acceptable
29 decontamination levels, sampling and analysis plans, and QA/QC specifications. If such future
30 plan contains provisions different from those in this Post-Closure Plan or Permit Attachment H1
31 (Active Institutional Controls), the Permittees shall submit a request for modification of the Post-
32 Closure Plan and the WIPP Permit. The changes must be approved and made part of the
33 revised Permit before the changes are implemented, in accordance with 20.4.1.500 NMAC
34 (incorporating 40 CFR §264.118(d)).

35 Implementation of Active Institutional Control Measures

¹ "Abnormal conditions" include any natural or human-caused conditions which could affect the integrity of Active Institutional controls required by the Permit or which could affect compliance of the WIPP with applicable RCRA standards.

1 Most of the active institutional control measures, such as long-term site monitoring and site
2 remedial actions, will be implemented simultaneously with facility closure. However, it may be
3 possible to implement some measures earlier. For example, salt disposal may begin prior to
4 final plant closure. Reclamation and restoration of unused disturbed surface areas has already
5 begun. Guarding and maintenance activities, which are already in place, could evolve into an
6 appropriate type of post-closure activity, subject to appropriate modifications of the Permit.

7 H-1a(2) Monitoring

8 Post-closure groundwater monitoring will involve a continuation of the monitoring plan in Permit
9 Attachment L as described in Permit Part 5. The sampling frequency may be changed to a
10 frequency of every two years after final facility closure is complete by modification of the Permit
11 as approved by the Secretary of the NMED in accordance with 20.4.1.901.B NMAC
12 (incorporating 40 CFR §270.42). In addition, the final target analyte list specified in Permit
13 Attachment L may be changed by permit modification based on final volume of waste.

14 H-2 Notices Required for Disposal Facilities

15 H-2a Post-Closure Certification

16 Within 60 days of completion of the post-closure care period after final facility closure, the
17 Permittees will submit to the Secretary of the NMED, via registered mail, a certification that
18 post-closure care was performed in accordance with the specifications of the approved post-
19 closure plan. The certification will be signed by the Permittees and by an independent New
20 Mexico registered professional engineer. Documentation supporting the independent registered
21 engineer's certification and a copy of the certification will be furnished to the Secretary of the
22 NMED.

23 H-2b Post-Closure Notices

24 Within 60 days after certification of closure of each underground HWDU or final facility closure,
25 the Permittees will submit to the Secretary of the NMED, and to the Eddy County government or
26 other applicable local government agencies, a record of the type, location, and quantity of
27 hazardous wastes disposed of in each underground HWDU as required in 20.4.1.500 NMAC
28 (incorporating 40 CFR §264.119).