Santa Fe, New Mexico

April 16, 2013

U.S. Department of Energy
Class 3 Permit Modification
(Closure System, Repository Reconfiguration, VOC)
To the Hazardous Waste Facility Permit
Waste Isolation Pilot Plant

<table>
<thead>
<tr>
<th>Name</th>
<th>Mailing Address</th>
<th>Would You Like to be on the Mailing List</th>
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<tbody>
<tr>
<td>Travis Kiphus</td>
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<td>Coleman Smith</td>
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<td>Kyle Marksteiner</td>
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<td>City Of Santa Fe P.O. Box 909, 801 W. San Mateo</td>
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</table>
WIPP Facility Class 3 Permit Modification Package

April 2013
3 Modifications Included

- Repository Reconfiguration of Panels 9 and 10
- Modification to the WIPP Panel Closure
- Revise Volatile Organic Compound (VOC) Target Analyte List and Other Changes to the VOC Monitoring Program
Repository Reconfiguration of Panels 9 and 10

April 2013
Scope

• Reconfigure the locations of Panels 9 and 10
• Designate new locations as Panels 9A and 10A
• Authorize disposal in Panels 9A and 10A
Original Configuration

- 8 disposal panels with 4 on each side of four main access drifts
- Main access drifts are used to transport waste to disposal panels and for ventilation
- Use main access drifts for Panels 9 and 10 after filling of Panels 1 through 8
Proposed Configuration

- Locate new disposal Panels 9A and 10A south of the existing Panels 4 and 5, respectively
Proposed Configuration

• Geotechnically more advantageous than the original configuration.
  - Convergence rates and fractures are dependent on the age of the excavation and the proximity of nearby excavations
  - As repository ages the conditions of excavations degrade
  - Degraded conditions require additional mining and installation of support structures
  - Enlarging main access drifts for disposal of waste will induce increased convergence rates and fracturing posing an increased concern for worker safety and will require more intense maintenance activities involving roof bolts, chain link etc.
  - Waste disposal operations will be impeded by increased maintenance
Benefits of Relocation

- Relocating Panels 9 and 10 south of the existing Panels 4 and 5 will:
  - enhance worker safety and
  - reduce maintenance requirements by providing a more stable geotechnical environment for waste emplacement in Panels 9A and 10A.
Classification of Proposed Modification

• Class 3 – In accordance with 40 CFR §270.42(d)(1) that states: “In the case of modifications not explicitly listed in appendix I of this section, the permittee may submit a Class 3 modification request to the Agency…”
Proposed Modification to the WIPP Panel Closure

April 2013
Scope

- Revision to panel closure system (PCS) design
- Revision of design requirements for the closure plan
- Deletion of the hydrogen and methane monitoring plan
- Revision to Clarify Applicability of Ongoing Disposal Room VOC Monitoring
- Revision to the panel closure schedule
- Editorial corrections regarding Panel Closure
Current Closure

- Option D
  - 12-foot explosion isolation wall
  - 26-foot Salado Mass Concrete (SMC) Monolith
Proposed New Design

- WIPP Panel Closure (WPC)
  - Two Barriers
    - Two steel bulkheads or
    - One steel bulkhead and one block wall
  - 100-feet of run-of-mine (ROM) salt between the two barriers
Panels 3, 4, and 6 through 10/10A

1. Salt Zone 100'-0" minimum length.
2. Salt layers can be inclined within specifications.
3. Detailed design drawings are presented in Appendix D.
4. The ROM salt shall be placed to fill up to the back.
5. ROM salt is a porous salt in the loose stope derived from underground mining operations at WIPP.
Panels 1, 2 and 5

1. Salt Zone 100'-0" minimum length.
2. Salt layers can be inclined within specifications.
3. Detailed design drawings are presented in Appendix D.
4. The ROM salt shall be placed to fill up to the back.
5. ROM salt is a porous salt in the loose state derived from underground mining operations at WIPP.

TYPICAL INTAKE/EXHAUST DRIFT
Proposed New Design

- Meets WIPP Permit performance standards for protectiveness
- Higher certainty of successful installation
  - New design demonstrated to be constructible
  - Option D requires use of unproven construction materials
- SMC formulation was developed for different application and never successfully poured in large quantities (>5 cubic yards)
Proposed New Design

- Less impactive to facility operations
  - No special materials such as quartz aggregate
  - No construction of special forms for SMC
  - No preparation and placement of SMC in the underground
  - Less complex activity
Revised Design Requirements

- Revised 5 design requirements, deleted 2, 8 left unchanged
  - The panel closure system shall perform its intended function under the conditions of a postulated methane explosion
- Hydrogen and Methane Monitoring Program Data
  - No methane detected in any samples to date
  - Statistical evaluation:
    » Hydrogen in Panel 3 will never reach lower explosive limit (LEL)
    » It will take 580+ years to reach LEL in Panel 4
- Thermal cracking of concrete shall be addressed
- Concrete is not part of new WPC design
Deletion of Hydrogen and Methane Monitoring

- Affected Permit sections are:
  - Part 4, Section 4.6.5
  - Attachment N1
- Initiated to determine realistic accumulation rates that may be used to develop less complex panel closure design
- With approval of new panel closure design, hydrogen/methane monitoring is no longer needed
Revision to Clarify Applicability of Ongoing Disposal Room VOC Monitoring

- Affected Permit sections are:
  - Part 4, Section 4.4.3
  - Attachment N, Section N-3a(3)

- Changes to clarify that ongoing disposal room VOC monitoring will be required for all panels, not just Panels 3 through 8, until final panel closure, unless explosion-isolation walls are installed in a panel.

"does not reduce VOC monitoring - just clarifies"
Revision to the Panel Closure Schedule

- Table G-1 being revised to:
  - Update actual and anticipated dates
  - Revision of Note 2 to clarify closure start date
  - Consolidation of Notes 5 and 6 into Note 5
Classification of Proposed Modification

- Class 3 – In accordance with 40 CFR §270.42(d)(1) that states: “In the case of modifications not explicitly listed in appendix I of this section, the permittee may submit a Class 3 modification request to the Agency...”
Proposed Modifications to the Waste Isolation Pilot Plant Volatile Organic Compound Monitoring Program

April 2013
Topics

• Specific Changes in the Permit Modification Request
  1. Update the volatile organic compound (VOC) target analyte list for the WIPP facility VOC monitoring programs (total but now are in sig concernts. to be an issue).
  2. Revise the method of determining compliance with the environmental performance standard and establish action levels VOC A from.
  3. Establish new room-based action levels (concentration of concern [COC]) for the revised target analyte list
  4. Eliminate the requirement to sample and report threshold exceedances for VOCs in filled disposal rooms that are not immediately adjacent to an active TRU waste disposal room and remove closed room monitoring for non-adjacent rooms
  5. VOC Monitoring Program clarifications and updates

• Classification of the Permit Modification Request
Topic 1: Update the volatile organic compound (VOC) target analyte list for the WIPP facility VOC monitoring programs

- Source-term
  - New weighted average source term based on over 136,000 headspace gas samples and 2004 inventory information used for performance assessment.

- Risk Screening
  - Compounds that make up 99 percent of the risk have changed based on
    - New source term
    - Revised EPA risk factors

- Deleting low concentration/low risk compounds
Topic 1: Update the volatile organic compound (VOC) target analyte list for the WIPP facility VOC monitoring programs

<table>
<thead>
<tr>
<th>CURRENT TARGET ANALYTES</th>
<th>PROPOSED TARGET ANALYTES</th>
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<tbody>
<tr>
<td>Carbon Tetrachloride</td>
<td>Carbon Tetrachloride</td>
</tr>
<tr>
<td>Chlorobenzene</td>
<td>Chloroform</td>
</tr>
<tr>
<td>Chloroform</td>
<td>Chloroform</td>
</tr>
<tr>
<td>1,1-Dichloroethene</td>
<td>1,2-Dichloroethane</td>
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<tr>
<td>1,2-Dichloroethane</td>
<td>1,2-Dichloroethane</td>
</tr>
<tr>
<td>Methylene Chloride</td>
<td>1,1,2,2-Tetrachloroethane</td>
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<tr>
<td>1,1,2,2-Tetrachloroethane</td>
<td>1,1,2,2-Tetrachloroethane</td>
</tr>
<tr>
<td>Toluene</td>
<td>1,1,1-Trichloroethane</td>
</tr>
<tr>
<td>1,1,1-Trichloroethane</td>
<td>Trichloroethylene</td>
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</tbody>
</table>

New!
Topic 1: Update the volatile organic compound (VOC) target analyte list for the WIPP facility VOC monitoring programs

• PMR provides:
  – New Source Term
    • Description of methodology
  – New Risk Screening Results
    • Description of methodology and results
  – Updated list of target analytes
Topic 2: Revise the method of determining compliance with the environmental performance standard and establish action levels

- Current method uses concentrations of concern
  - Based on back-calculating concentration at VOC-A that results in the limiting exposure to receptor
  - Risk apportioned to each compound
    - Not based on actual distribution of VOC concentrations
    - Compounds were treated as either carcinogenic or non-carcinogenic
Topic 2: Revise the method of determining compliance with the environmental performance standard and establish action levels

- Difficulty in apportioning risk to proposed list of compounds
  - Compounds contribute to both carcinogenic and non-carcinogenic risk
  - One compound dominates, others may be below detection levels
  - Anytime EPA changes risk factors, reapportionment may be necessary
Topic 2: Revise the method of determining compliance with the environmental performance standard and establish action levels

• Proposed method uses Station VOC-A values to calculate risk to receptor on the surface
  – Calculate concentration on surface at receptor by accounting for dilution by repository exhaust air and dispersion from the stack to the receptor
  – Sum risk from all analytes and compare to risk limits
  – Implement existing actions if limits are exceeded
    • Includes option to propose alternative actions
  – Required annual review of compounds (based on monitoring results and EPA risk levels)
    • Class 1 modification to update EPA factors in Permit or change target compounds
Topic 2: Revise the method of determining compliance with the environmental performance standard and establish action levels

• PMR provides:
  – New Risk Assessment
  – Table of analytes and current recommended EPA risk factors
  – Action Levels
    • Notification
    • Remedial action
    • Alternative actions may be proposed
  – Methodology for determining risk
    • Example calculation
  – Requirement to review compounds and risk factors annually and update accordingly
Topic 3: Establish new room-based action levels (concentration of concern) for the revised target analyte list

- One new proposed compound is trichloroethylene
  - IDLH is 1,000 ppm
  - COC of 48,000 ppmv
- PMR provides:
  - New concentration of concern
  - Calculation methodology

*Emphasis on previous careers established by name*
Topic 4: Eliminate the requirement to sample and report threshold exceedances for VOCs in filled disposal rooms that are not immediately adjacent to an active TRU waste disposal room and remove closed room monitoring for non-adjacent rooms.

- Room based action levels have been established to protect workers in the event of a roof fall in the adjacent filled CH TRU waste room.
  - The action items are triggered by reaching the concentration of concern in the adjacent filled room.
  - The Permit currently requires that if the concentration in non-adjacent rooms reaches an action level in Table 4.6.3.2, reporting within seven days is necessary, even though reaching the higher action levels in non-adjacent rooms will not trigger the closure requirements.

- PMR proposes:
  - Revise the text to limit monitoring and reporting of results to the adjacent room only
  - Remove the requirement to monitor non-adjacent rooms
Topic 5: VOC Monitoring Program clarifications and updates

- The Permittees are proposing to rewrite portions of the VOC Monitoring Program
  - Editorial changes to update program language
  - Remove unnecessary detail
  - Technical changes to align the program with EPA methods for ambient air monitoring
  - Clarifications to make the requirements internally consistent.

- Similar to changes recently made to the Groundwater Monitoring Program
Topic 5: VOC Monitoring Program clarifications and updates

• Major changes include:
  – Using sub-atmospheric samples for Repository Monitoring
  – Changing the Repository Monitoring sample to a 24 hour sample instead of the current six hour sample
  – Reducing the sampling frequency from twice per week to once per week
  – Eliminating VOC Station B
  – Reporting VOC results annually instead of semi-annually
Topic 5: VOC Monitoring Program clarifications and updates

- PMR contains:
  - Justification for each change
  - Redline/Strikeout of Attachment N
  - Changes to incorporate the other topics

- Because this PMR was submitted with the Panel Closure PMR, no changes to Attachment N1 are proposed.
Classification

- This PMR is being submitted by the Permittees as a Class 3 modification pursuant to 20.4.1.900 NMAC (incorporating 40 CFR 270.42(d)(1))
  - Several of the changes are not explicitly listed in Appendix 1
- Updating information relative to volatile organic compounds provided in the original Permit Application to satisfy the requirements of 20.4.1.900 NMAC (incorporating 40 CFR 270.23 (c) and (e)).