

## **WIPP HAZARDOUS WASTE FACILITY PERMIT UPDATE**

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### **ABSTRACT**

The Waste Isolation Pilot Plant (WIPP) Hazardous Waste Facility Permit (HWFP) was issued on October 27, 1999. Since that time, the WIPP has sought modifications to clarify the permit language, provide alternative methods for meeting permit requirements and to update permit conditions. This effort has resulted in over 1,500 individual changes to the permit since it was issued. In 2004, several significant modifications to the permit were submitted to the New Mexico Environment Department (NMED).

A modification to remove headspace gas sampling and analysis was submitted at the direction of Congress. Section 311 of the Fiscal Year 2004 Energy and Water Developments Appropriations Act (Public Law 108-137) directs the Department of Energy to submit a permit modification that limits waste confirmation to radiography or visual examination of a statistical subpopulation of containers and directs that disposal room performance standards are to be met by monitoring for volatile organic compounds in the underground disposal rooms. This statute translates into the elimination of other waste confirmation methods such as headspace gas sampling and analysis and solids sampling and analysis.

In November 2003, the NMED proposed to modify the WIPP permit to limit acceptable waste to those waste streams that appeared in the 1995 Transuranic (TRU) Waste Baseline Inventory Report. As an alternative to this proposal, the DOE proposed a permit modification that specifically prohibited any TRU mixed waste from tanks that was ever managed as HLW unless the waste stream is specifically approved through a permit modification.

Other changes to the permit were submitted to allow additional containers to be shipped to WIPP and to define drum age criteria (DAC) values for these containers. This includes direct loaded 85-gallon drums, 100-gallon drums and ten-drum overpacks. The NMED placed restrictions on shipment of super-compacted waste in the process of approving the new DAC values.

### **INTRODUCTION**

The NMED issued the HWFP [1] for the WIPP in October 1999. This event marked the culmination of a decade-long process aimed at defining the manner in which the hazardous waste regulations would be applied to TRU waste. The four-volume permit contains detailed permit conditions covering a number of topical areas such as waste characterization, waste handling, waste storage, waste disposal, and record keeping. Working within these conditions has been highly successful. However, this success notwithstanding, those responsible for implementing

the HWFP has identified better, cheaper, faster, and safer ways to perform work. Implementing these improved processes involves formal modification to the HWFP.

### **Permit Modification Process**

Fortunately for those that hold permits issued under the Resource Conservation and Recovery Act (RCRA) Regulations (or comparable state regulations), the EPA anticipated that permits would need to change over time. The EPA codified procedural requirements for modifying permits in 40 CFR 270.42 [2]. In defining the modification process, EPA identified three classes of modifications.

Class 1 permit modification notifications are submitted within 7 days of implementation of a change that qualifies as a Class 1. These do not need prior agency approval. While agencies do not have to approve Class 1 modifications prior to implementation, they may determine that the change is misclassified and reject the change. In such cases, the facility must go back to operating as it was prior to implementing the change. One type of Class 1 permit modification, referred to in the regulations as Class 1 star (Class 1\*) cannot be implemented until approved by the agency. Class 1 changes do not require a public comment period, although notification of the public is mandated.

Class 2 modifications require a 60-day public comment period prior to Agency consideration. During this period, the applicant must conduct a public information meeting. The agency has up to 60 days to consider the modification request and the public comments prior to making a decision of approve, approve with changes, deny, or process as a Class 3 modification.

Class 3 modifications undergo the 60-day public comment period similar to Class 2 modifications. At the end of the 60-day period, the agency will decide whether or not to proceed with modification of the permit or to deny the request. If the process continues, the agency then implements its administrative procedures, which are similar to procedures for obtaining a permit. The process may involve a public hearing.

### **Calendar Year 2004 Accomplishments**

There are four significant items to discuss for calendar year 2004. Three directly impact the waste generator sites and one indirectly affects the waste generators. These are the Section 311 Permit Modification Request, the Drum Age Criteria Permit Modification Request, the Tank Waste Permit Modification Request, and the container Management Permit Modification Request. Each of these is discussed below.

#### **Section 311 Permit Modification Request**

In November 2003, the Congress passed the Energy and Water Development Appropriations Act for Fiscal Year (FY) 2004 [3]. Section 311 of the Act states:

- (a) The Secretary of Energy is directed to file a permit modification to the Waste Analysis Plan (WAP) and associated provisions contained in the Hazardous Waste

Facility Permit for the Waste Isolation Pilot Plant (WIPP). For purposes of determining compliance of the modifications to the WAP with the hazardous waste analysis requirements of the Solid Waste Disposal Act (42 U.S.C. 6901 et seq.), or other applicable laws waste confirmation for all waste received for storage and disposal shall be limited to: (1) confirmation that the waste contains no ignitable, corrosive, or reactive waste through the use of either radiography or visual examination of a statistically representative subpopulation of the waste; and (2) review of the Waste Stream Profile Form to verify that the waste contains no ignitable, corrosive, or reactive waste and that assigned Environmental Protection Agency hazardous waste numbers are allowed for storage and disposal by the WIPP Hazardous Waste Facility Permit.

(b) Compliance with the disposal room performance standards of the WAP shall be demonstrated exclusively by monitoring airborne volatile organic compounds in underground disposal rooms in which waste has been emplaced until panel closure.

The President signed the Energy and Water Development Appropriations Act for Fiscal Year 2004 on December 1, 2003. Similar language appears in the FY 2005 appropriations bill [4]. Accordingly, the Section 311 Permit Modification Request was submitted to the NMED on January 9, 2004.

Section 311 establishes that sampling and analysis of waste for determining compliance with the Solid Waste Disposal Act or the New Mexico Hazardous Waste Act are no longer required for the WIPP. However, generator/storage sites may use sampling and analysis to complete or supplement their acceptable knowledge (AK) records as set forth in Section B4-2 of the HWFP Waste Analysis Plan (WAP). Several major changes are proposed to the HWFP.

First, all requirements related to Headspace Gas Sampling and Analysis (HSGSA) are removed. In the HWFP HSGSA is required to be performed on nearly every container. The information is used to identify the concentration of certain analytes that are regulated as emissions at the WIPP facility. In addition, the information is used to confirm the assignment of hazardous waste codes based on AK. This is viewed as a significant improvement in the HWFP from several standpoints.

- It eliminates a significant amount of drum handling.
- It accelerates the waste characterization process by eliminating a significant amount of data that requires verification and validation.
- It eliminates the mandatory waiting periods for internal gases to equilibrate prior to sampling. Some of these periods are on the order of 225 days.
- It eliminates a cost of \$620 per container for sampling and analysis.
- It eliminates about 30 minutes per drum of worker contact time, thereby reducing the radiation dose.

Second, the proposed modification removes all of the requirements associated with the sampling and analysis of homogenous solids. While this activity is not performed on a large number of containers, it is highly impactive and requires special equipment and radiation confinement in

order to take samples of the waste matrix for analysis. Information from this activity is used for confirming the assignment of hazardous waste codes by AK. As with HSGSA, the elimination of this activity reduces the average cost and radiation exposure.

Third, the proposed modification eliminates the use of VE as a quality control on radiography. This activity is confirmatory in nature, and is thereby eliminated by the language of Section 311.

Fourth, the proposed modification stipulates that radiography or visual examination (VE) be performed on a subset of the containers in the waste stream. At a minimum, ten percent of waste containers randomly selected from each waste stream or waste stream lot will be confirmed by radiography and/or VE. It is proposed that confirmation be completed for all selected containers from a TRU mixed waste stream or waste stream lot before TRU mixed waste from that waste stream or waste stream lot can be shipped to WIPP. If it is determined by radiography or VE that a selected container fails to confirm the AK (i.e., the drum contains prohibited waste or contains waste that does not match the waste stream description), all subsequent containers in that waste stream will be subject to confirmation. For those waste streams in which all containers are subject to confirmation, containers from the waste stream that have undergone successful confirmation can be shipped to WIPP prior to completing confirmation activities for the entire waste stream. Currently, generator sites use 100 percent radiography or VE to examine containers of waste. The proposed modification represents a significant reduction in that frequency for well documented waste streams. On the other hand, if the generator does not have sufficient AK information to assure that there are no prohibited items or that the waste stream is well defined in terms of eligible containers, then higher examination rates will be necessary and appropriate.

Because of the reduction in the frequency of radiography, several other changes are necessary. First, the process for estimating material parameter weights is proposed for modification. Currently, material parameter weights are estimated during radiography or VE for each container. With a reduced frequency of examination, an alternative approach, based on knowledge of the waste stream is proposed. Under the proposal, the material parameter weights for each waste stream will be reported to the WIPP Waste Information System (**WWIS**) on a container basis. The weights or volumes material parameter in the entire waste stream can be estimated and allotted to each individual container using waste stream ratios for each material parameter and the weight of waste in the subject container.

Fifth, the proposed modification changes the manner in which compliance with the environmental performance standards for air emissions for the repository is demonstrated. The Confirmatory Volatile Organic Compound Monitoring Plan is proposed to be modified to require that compliance with the disposal room performance standards of the WAP would be demonstrated exclusively by monitoring airborne volatile organic compounds in underground disposal rooms in which waste has been emplaced until panel closure. Therefore, the PMR proposes to modify the repository VOC monitoring plan set forth in Attachment N so as to provide for closed-room monitoring. The modified VOC monitoring plan would eliminate use of container Headspace Gas Sampling and Analysis (HSGSA) for purposes of VOC monitoring.

It is expected that the NMED will issue a Notice of Deficiency (NOD) for the Section 311 permit modification before the end of Calendar year 2004. This will give the WIPP staff an opportunity to address questions and concerns that the NMED presents with regard to implementing this statutory requirement.

### **Drum Age Criteria Modification Request**

The HWFP establishes a waiting period between the time a container is closed and when headspace samples are taken. This time period is referred to as the DAC value. The purpose of the DAC value is to ensure that samples of gaseous VOCs collected from within a waste container are representative. Samples are considered representative when the VOCs have reached concentrations that are at least 90 percent of the equilibrium steady-state concentrations, after which the collection of a representative headspace gas sample is ensured. The DAC values are implemented on a container basis in terms of the number of days required to reach at least 90 percent of steady-state.

This modification, which was approved by the NMED on May 7, 2004 added packaging-specific DAC values for 85-gallon and 100-gallon drums, and for ten-drum overpacks (TDOPs). The new packaging-specific DAC values were determined using the approved methodology [4, 5]. When the permit modification request was submitted to the NMED it incorporated responses to applicable stakeholder and New Mexico Environment (NMED) comments on the previous DAC modification request. Many of the stakeholder and NMED comments focused on one particular use of 100-gallon drums to package super compacted 55-gallon drums with rigid liners. Super compaction is a process that the U.S. Department of Energy will use at its Advanced Mixed Waste Treatment Project at the Idaho National Engineering and Environmental Laboratory under a permit issued by the State of Idaho. These comments requested technical information related to super compacted waste and suggested the need to perform additional DAC modeling for this waste.

The NMED approved the requested DAC values with the exception that supercompacted drums with rigid liners could not be sampled under any of the configurations in the HWFP. Another modification may be needed to specifically address this packaging configuration.

### **Procedure for Consideration of Tank Waste**

This permit modification established a procedure for approval of the disposal of TRU mixed waste that has ever been managed as high-level waste (HLW) by adding language to the WIPP HWFP that prohibits WIPP from accepting TRU mixed waste that has ever been managed as high-level waste unless it is approved for WIPP disposal through a Class 3 permit modification. In addition, the modification, which NMED approved on October 29, 2004, provides a list of 243 specific tanks which are subject to the exclusion. These are shown in Table I. The generator site will have to demonstrate that none of the waste that they propose for disposal at WIPP under this provision meets the definition of HLW.

**Table I. Waste Tanks Subject To WIPP HWFP Exclusion**

Hanford Site - 177 Tanks	
A-101 through A-106	C-201 through C-204
AN-101 through AN-107	S-101 through S-112
AP-101 through AP-108	SX-101 through SX-115
AW-101 through AW-106	SY-101 through SY-103
AX-101 through AX-104	T-101 through T-112
AY-101 through AY-102	T-201 through T-204
B-101 through B-112	TX-101 through TX-118
B-201 through B-204	TY-101 through TY-106
BX-101 through BX-112	U-101 through U-112
BY-101 through BY-112	U-201 through U-204
C-101 through C-112	
Savannah River Site - 51 Tanks	
Tank 1 through 51	
Idaho National Engineering and Environmental Laboratory - 15 Tanks	
WM-103 through WM-106	WM-180 through 190

This modification was necessitated by NMED action in November 2003, when the NMED published a Public Notice and Fact Sheet announcing its intent to approve a permit modification it had developed that would limit waste eligible for disposal at WIPP to an inventory developed when the permit was originally issued. The original list, referenced in the permit application, was developed to allow DOE to estimate key waste parameters for the purpose of determining the performance of the repository for 10,000 years.

At the Permittees' request, NMED scheduled a public hearing on its proposed modification. On June 2, 2004, NMED and the Permittees filed a Joint Motion with the Hearing Officer requesting that the public hearing on NMED's permit modification be held in abeyance to allow the Permittees time to submit, and NMED to consider this permit modification which replaces NMED's proposed permit modification. On June 3, 2004, the Hearing Officer issued an Order granting the Joint Motion. This PMR was submitted in compliance with the Hearing Officer's Order.

WIPP will work with generator sites to develop the necessary Class 3 modification requests in order to get TRU waste that has been previously managed as high level waste approved for disposal at WIPP. This process assures there is full public discussion of any decision regarding TRU waste that is associated with the management of high-level waste at the generator sites.

### **Container Management Improvements**

The Container Management permit modification was submitted to the NMED in order to accomplish several purposes related to the accelerated receipt of waste. First, the modification expands the permitted storage capacity at the WIPP. The DOE has developed a waste shipping schedule that anticipates up to 90 contact-handled (CH) packages per week through the WIPP facility. Increased storage capacity will be instrumental in sustaining this aggressive shipping schedule. Related to the aggressive shipping schedule is an increase in the size of the CH package fleet. The modification proposes to accommodate the projected fleet of TRUPACT-II, HalfPACT, and TRUPACT-III packages. In order to accommodate this, increases in storage capacity are needed. Other aspects of this modification request address the handling of TRUPACT-III shipping containers, rail receipt of waste, and the management of large boxes. While these impact the availability of transportation capability to the waste generators, the permit modification mostly addresses WIPP facility changes.

This modification request is pending at the NMED.

### **Other Approvals During 2004**

The NMED approved other permit modification requests during 2004. One that is of particular significance is the approval for the Los Alamos National Laboratory (LANL) to ship sealed sources to WIPP without having to perform HSGSA. This change was approved after the DOE demonstrated to the NMED that the subject sealed sources were VOC free and that adequate AK documentation was available to support that fact. This modification will facilitate the movement of unneeded sealed sources from LANL to WIPP, and facilitate the collection of additional sources from around the country. Disposal of these sealed sources is considered to be a priority for homeland protection.

### **Anticipated Activity for 2005**

Much of 2005 is expected to be devoted to furthering the administrative process for the Class 3 modifications that are already before the NMED. This includes the Section 311 permit modification, the Remote-handled waste permit modification which has been pending since June 2002, and the container management improvements modification.

### **REFERENCES**

1. New Mexico Environment Department, Hazardous Waste Facility Permit issued to the Waste Isolation Pilot Plant, EPA No. NM4890139088, October 27, 1999
2. Environmental Protection Agency, Permit Modifications for Hazardous Waste Management Facilities; Final Rule, 53 Fed. Reg., No. 188, Page37912, September 28,

1988.

3. Pub. L. 108-137, Energy and Water Development Appropriations Act for Fiscal Year 2004, Section 311.
4. Determination of Drum Age Criteria and Prediction Factors Based on Packaging Configurations, INEEL/EXT-2000-01207, Bechtel BWXT Idaho, LLC, Idaho Falls, ID, October 2000.
5. Determination of Drum Age Criteria Values for Ten-Drum Overpacks, 85-Gallon Drums, and 100-Gallon Drums, Revision 1, Shaw Environmental, Inc., Albuquerque, NM, December 2003.