

9482.1994(01)

APPLICABILITY OF A PROPOSED HAZARDOUS WASTE REGULATION TO
CERTAIN DOE RADIOACTIVE MIXED WASTES

United States Environmental Protection Agency
Washington, D.C. 20460
Office of Solid Waste and Emergency Response

September 2, 1994

Mr. Raymond P. Berube
Deputy Assistant Secretary for Environment
U.S. Department of Energy
Washington, D.C. 20585

Dear Mr. Berube:

I am pleased to respond to your July 13, 1994, letter, in which you identify concerns about the applicability of a proposed hazardous waste regulation to certain of the Department of Energy's (DOE's) radioactive mixed wastes. Your letter references the Environmental Protection Agency's (EPA's) May 19, 1994, workgroup draft of a final rulemaking notice which would address the control of organic air emissions from hazardous waste tanks, surface impoundments, and containers (RCRA docket F-91-CESP-SO509).

In particular, your letter takes issue with that provision of the May 19, 1994, draft final rule (40 CFR 264.1086(b)(1)(i) that would require that hazardous waste must be placed in a container that is equipped with a "tight" cover that permits no detectable organic emissions when it is closed and sealed. According to your letter, such a container could give rise to an explosive risk when used to contain certain of DOE's radioactive mixed wastes. This risk arises from the potential generation of hydrogen gas within the container as plastics and other organic materials undergo radiolytic decomposition. Your letter requests that the final rule allow alternative approaches for facilities managing mixed wastes in containers.

In response to the comments that were submitted by the Department to EPA in October 1991, language was added in section 265.1087(d) of the May 19, 1994, draft final rule that would allow one or more safety devices that vent directly to the atmosphere to be used on

a container. This provision would require that the safety device not be used for planned or routine venting, and would also require that the safety devices remain in a closed and sealed position, except in cases where opening the device during an unplanned event is necessary to prevent physical damage to the container. When this provision was added to the draft rule, it was our understanding that it would address DOE's concerns with respect to container management of mixed wastes.

Your July 13, 1994, letter clarifies several additional mixed waste management practices required under the Waste Acceptance Plan for the DOE's Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico. Under these practices, the mixed waste drums are punctured to release any buildup of hydrogen gas, and a NUCFIL filter vent is attached to the drum to retain the radionuclides. As your letter suggests, this procedure would not appear to be in compliance with the May, 1994, draft rule's requirements, since it allows volatile organic compounds to be released to the atmosphere.

Please be assured that I am aware of the Department's concerns about the safety of storing mixed wastes in tightly covered containers. As we continue to develop the final rule, we will attempt to address the situation appropriately.

Thank you for your interest in Air Emissions Standards rulemaking, and for sharing the Department's concerns with me.

Sincerely,

Michael H. Shapiro
Director, Office of Solid Waste

cc: Matt Hale
Michele Aston
Docket Rulemaking
(F-91-CESP-SO509)

Attachment

-----United

States Department of Energy
Washington, D.C. 20585

July 13, 1994

Mr. Michael H. Shapiro, Director
Office of Solid Waste (OSW-300)
U.S. Environmental Protection Agency
401 M Street SW
Washington, D.C. 20460

Dear Mr. Shapiro:

On October 21, 1991, the Department of Energy (DOE) submitted comments to the Environmental Protection Agency (EPA) on the "Hazardous Waste Treatment, Storage, and Disposal Facilities; Organic Air Emission Standards for Tanks, Surface Impoundments, and Containers; Proposed Rule," 56 FR 33490, July 22, 1991. In its October 1991 comments, the Department raised a number of issues with respect to the application of the proposed requirements to tanks, surface impoundments, and containers utilized for the management of radioactive mixed wastes at DOE facilities.

While DOE's concerns regarding the proposed VOC standards have been partially addressed in the May 1994 version of the draft final rule, we are concerned that one particular issue specific to the management of radioactive mixed waste (RMW) has not been addressed. This outstanding issue constitutes the most serious concern raised in the original comments (i.e., the potential explosion, hazard associated with the management of RMW in invented containers). Proposed provision 40 CFR 264.1086(b)(1)(i) indicates that hazardous waste must be placed in a "container that is equipped with a cover which operates with no detectable organic emissions when all openings (i.e., lids, bungs, hatches, and sampling ports) are secured in a closed, sealed position." As noted on page 22 of our original comment package, RMW containers cannot be tightly sealed due to unacceptable pressure buildup of hydrogen gas to levels which can potentially cause rupture of the drum or create a potentially serious explosion hazard.

RO 13699

The generation of hydrogen gas is a result of the radiolytic decomposition of organic compounds (i.e., plastics) and/or aqueous solutions within the container. Plastics are commonly used as a barrier to alpha radiation both in handling operations and in waste packaging. Over time, the alpha particle causes the hydrolysis of chemical bonds within the plastic material which results in the release of hydrogen gas. Likewise, radiolysis of aqueous solutions will yield hydrogen. Additionally, radiation induced degradation and biodegradation of organic ion-exchange resin waste, which are also RMW, generated during water treatment at nuclear facilities, can result in the production of gaseous products (i.e., hydrogen and carbon dioxide) which in turn can result in pressure buildup and failure of containers. High integrity containers are used as alternative to solidification as a means of stabilizing ion-exchange resin wastes for disposal.

Because of pressure buildup inside the container, a vent for gaseous compounds may be necessary to prevent failure of a high-integrity container (i.e., vent designs incorporated into high integrity containers restrict the release of radionuclides from the container into the environment) (see footnote 1).

The Department believes a requirement for "tight" covers on containers of RMW may ultimately be more harmful to human health and the environment than the current practice of venting these containers. If the Department is required to maintain tight covers on RMW containers, there will be an enhanced potential for explosion due to a buildup of gas in the container. In addition, if an explosion involving radioactive and hazardous waste components were to occur, the personnel exposures to radiation and the costs associate with the cleanup of the radioactive and hazardous components released would offset any benefit realized as a result of requiring closed "tight" containers.

Finally, numerous DOE nuclear facilities produce and store a variety of RMW, including transuranic (TRU) radioactive mixed waste. Since 1970 TRU wastes have been packed in drums for temporary storage at certain DOE sites. Much of this waste is ultimately destined for final disposal/ storage at the Waste Isolation Pilot Plant (WIPP), Carlsbad, New Mexico. In accordance with the WIPP Waste Acceptance Plan (WAP), wastes that are to be shipped to the WIPP must be in containers that are vented to prevent the buildup of pressure (see footnote 2). The vents must

be filtered to ensure that no radioactive waste components are released.

In order to comply with these requirements, at the Idaho National Laboratory Drum Vent Facility, a drum lid is punctured to release any buildup of potentially explosive hydrogen gas and a NUCFIL filter vent is attached. The function of a NUCFIL filter vent is to retain radionuclides inside a container while allowing hydrogen and other gases to pass through to the atmosphere. In particular, the carbon composite membrane used in the filter vent does not inhibit the passing of VOC's from the container into the atmosphere.

Because it is an unsafe practice to store RMW drums with tight covers, and because the WIPP WAP requires that containers be vented for shipment to the WIPP, many DOE facilities may be unable to meet the tight cover control device criteria as specified in the draft final rule.

Therefore, DOE is requesting that the final rule be modified to allow alternate approaches to compliance for TSDFs managing RMW containers subject to the Subpart CC requirements for "no detectable organic emissions." The modifications would allow these facilities to comply with the proposed regulations in a safe and cost effective manner while also complying with WIPP requirements.

Sincerely,
Raymond P. Berube
Deputy Assistant Secretary for Environment

cc: Ms. Sally Katzen, Administrator
Office of Information and Regulatory Affairs
Office of Management and Budget
New Executive Office Building
Washington, D.C. 20503

Mr. Matthew Hale
Deputy Division Director
Permits and State Programs Division
Office of Solid Waste
U. S. Environmental Protection Agency
401 M Street SW
Washington, D.C. 20460

Ms. Michele Aston
Chemical and Petroleum Branch
Emission Standards Division (MD-13)
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

- 1 P. L. Piciulo, "Technical Considerations for High-Integrity Containers for the Disposal of Radioactive Ion-Exchange Resin Waste," United States Nuclear Regulatory Commission, NUREG/CR-3168, p. 76, October 1983.

- 2 Section "3.4.7.2 TRANSPORTATION: WASTE PACKAGE REQUIREMENTS (TRUPACT-II Requirements) of the Waste Acceptance Criteria for the Waste Isolation Pilot Plant (WIPP), WIPP/DOE-069, Revision 4, UC-70, December 1991, requires that the gas generation and release characteristics of the waste containers of the waste containers shall be controlled by requiring that (1) all waste containers, including overpacks, shall be vented with filters, and (2) any rigid drum liners used in the waste containers shall be either be filtered or punctured meet the specifications described in the TRUPACT-II SARP (NuPac, "Safety Analysis Report for the TRUPACT-II Shipping Package (SARP), Docket No. 71-9218, Revision 9, or current Revision. The TRUPACT-II SARP limits are based on the radiolytic gas generation capabilities of the waste and a requirement for ensuring that any hydrogen generated in the innermost waste bag will not exceed five volume percent over a 60-day transport period.