



Technical Assistance Project:

DOE/EH (CERCLA)-9706

# Clarification of Reporting Requirements Under CERCLA Section 103: *Mixtures*

Office of Environmental Policy and Assistance, RCRA/CERCLA Division (EH-413)

June 1997

## The Issue

The Comprehensive Environmental Response, Compensation and Liability Act, (CERCLA), requires that "releases of hazardous substances to the environment" above certain threshold amounts (Reportable Quantities or RQs) be reported to the National Response Center. The requirements regarding how to determine if an RQ has been reached when *mixtures* of hazardous substances are released are complicated, and often make compliance difficult.

Nevertheless, failure to comply could result in civil or criminal penalties. In response to questions raised by DOE field elements, this guidance is part of a series that will provide updated information on hazardous substance release reporting requirements and other CERCLA issues.

The Office of Environmental Policy and Assistance (EH-41) within the Department of Energy's Office of Environment, Safety and Health responds to those questions relating to the reporting of releases for which the U.S. Environmental Protection Agency (EPA) has a clearly articulated position. Additional guidance on reporting releases will be issued as EPA defines a clear position. The interpretations outlined below have been reviewed by the EPA Office of Emergency and Remedial Response and are consistent with its current enforcement policies.

## Mixture Reporting Requirements

The reporting requirements under CERCLA §103 for mixtures of hazardous substances are specified in 40 CFR 302.6(b), which states that:

*"(i) if the quantity of all the hazardous constituent(s) of the mixture or solution is known, notification is required where an RQ or more of any hazardous constituent is released; or (ii) if the quantity of one or more of the hazardous constituent(s) of the mixture or solution is unknown, notification is required where the total amount of the mixture or solution released equals or exceeds the RQ for the hazardous constituent with the lowest RQ."*

EPA first interpreted the mixture rule in the preamble to the April 4, 1985, final rule (50 FR 13456). In that preamble, the Agency emphasized that, for CERCLA purposes, the mixture rule applies to ignitable, corrosive, reactive (ICR) and toxic characteristic (TC) wastes, and to "listed" waste streams designated under the Resource Conservation and Recovery Act (RCRA). If the quantity of all the hazardous constituents in the waste is known, notification is required where an RQ or more of any hazardous constituent is released. If the quantity of one or more of the hazardous constituents is unknown,

notification is required where the total amount of the mixture or solution released equals or exceeds the RQ for the hazardous constituent with the lowest RQ. In addition, if the person in charge knows that an RQ of a hazardous constituent of a waste has been released before the RQ for the ICR/TC or "listed" waste has been exceeded, the release of that constituent must be reported.

However, CERCLA does not require use of any monitoring devices or testing over and above what is already required under other statutes or regulations. To make the determination of whether an RQ or more of a hazardous substance has been released into the environment and, therefore, must be reported to the National Response Center under CERCLA §103, persons in charge of facilities may estimate releases based on past release data, engineering estimates, knowledge of the facility's operations, or best professional judgment. Regardless of the method used to estimate releases, however, all estimates must have a sound technical basis (50 FR 13463).

EPA again reiterated the same position in the preamble to the June 12, 1995, final rule (60 FR 30926). EPA stated that under the mixture rule, as set forth in 40 CFR 302.6(b), if the quantity of each of the hazardous constituents of a waste is known, reporting is required only when an RQ or more of any of the individual hazardous constituents is released. The Agency's mixture rule also provides that if the quantity of one or more of the hazardous constituents is unknown, reporting is required when the total amount of the mixture or solution released equals or exceeds the RQ for the hazardous constituent with the lowest RQ (60 FR 30932). Thus, the reporting requirements

for hazardous wastes are identical to the requirements applicable to any other mixture of hazardous substances.

### **Examples of Reporting Requirements and Mixtures:**

Addressed below are several requests for clarification from DOE field elements on the interpretation and implementation of the mixture rule for release reporting .

- (1) Four hundred pounds (lbs) of F-001 trichloroethylene (triclene) spent solvent hazardous waste (RQ 100 lbs.) are spilled onto the ground from a hazardous waste drum being transported to RCRA storage. The generator performed a chemical analysis of the waste prior to the spill and found it contained 20 lbs. triclene (RQ 100 lbs.) and 380 lbs. water. There are also traces of oil and heavy metals. Has an RQ been released?

Because the hazardous constituent quantities in the waste stream are known, the mixture rule may be applied. In comparing the quantity released of triclene to its RQ of 100 lbs., a determination can be made that the released quantity of the hazardous constituent in the waste stream is less than its RQ. Therefore, the spill is not reportable under CERCLA §103.

- (2) Four hundred pounds of RCRA F-001 hazardous waste are spilled to the ground, and the waste is known to contain triclene and water. The amount of triclene is approximately 20 percent (80 lbs.) based on process use of the solvents. Has an RQ been released?

Although an analysis of the waste was not performed, knowledge of the process use of the solvent would constitute a sound technical basis for estimating the quantity of trichloroethylene released. Because it was estimated that only 80 lbs. of trichloroethylene was released, and its RQ is 100 lbs., the spill would not be reportable under CERCLA §103.

- (3) Three hundred pounds of RCRA D-001 ignitable hazardous waste (RQ 100 lbs.) are spilled from a drum. The contents were previously analyzed, and the drum contains 30 lbs. acetone (RQ 5000 lbs), 150 lbs. ethanol (not a "listed" hazardous waste constituent), and 120 lbs. water. Has an RQ been released?

EPA made clear in the April 4, 1985, preamble (50 FR 13463) that the mixture rule could be applied to ICR/TC wastes, if the concentrations of all the hazardous constituents in the waste are known. The only "listed" hazardous waste constituent in the D-001 ignitable hazardous waste stream in this example is acetone; the quantity released of acetone is 30 lbs., well below its 5000 lb. RQ. A second constituent in the mixture is ethanol, however, which is not a "listed" hazardous substance but, nonetheless, may itself exhibit the RCRA hazardous waste characteristic of ignitability. If in this scenario ethanol itself exhibits the RCRA ignitability characteristic, then the substance is a CERCLA hazardous substance with a 100-pound RQ (the RQ for all ICR wastes). Thus, in applying the mixture rule, the quantity of ethanol released must be considered in determining whether the release is reportable. Because the release of 150 lbs. of ethanol exceeds the 100 lb. RQ,

the release would be reportable under CERCLA §103.

Note: If the quantity released of the ethanol constituent were less than 100 lbs., and all other constituent concentrations remain unchanged from those specified in the example, the release would not be reportable under CERCLA §103. Further, if there were more than one *unlisted* hazardous waste constituent in the waste stream, each a different ICR/TC waste released in quantities of less than 100 lbs., the combined release also would not be reportable under CERCLA §103. Under the mixture rule, each hazardous waste constituent may be considered separately if the concentrations of the constituents are known (i.e., the quantities released would not be additive).

- (4) Four hundred pounds of chromium hazardous waste (D-007 toxic characteristic waste, RQ 10 lbs.) are spilled onto gravel. The waste contains 50 ppm (0.002 lbs.) sodium bichromate (RQ 10 lbs), 100 ppm (0.004 lbs.) sodium carbonate (not a "listed" hazardous waste constituent), and the remainder water. Has an RQ been released?

All of the constituent quantities are known in this release example; therefore, the mixture rule may be applied to determine whether the release is reportable under CERCLA §103. Sodium carbonate is not a "listed" hazardous waste constituent and does not contribute to the hazardous property (i.e., characteristic) of the waste. Therefore, the quantity of sodium carbonate released does not have to be considered when applying the mixture rule under CERCLA §103; only the amount of sodium

bichromate released needs to be considered. Because the quantity of sodium bichromate released (0.002 lbs) is less than the 10 lb. RQ, the release would not be reportable under CERCLA §103.

Note: If the compound contributing the chromium was not known, and only a total chromium analysis or TCLP analysis has been performed, the release still would not be reportable under CERCLA §103 because the quantity released of the chromium constituent is less than the lowest RQ of the chromium compounds listed in 40 CFR 302.4. That is, even if one assumed that the chromium constituent that contributed to the waste stream's classification was the most toxic chromium substance listed in 40 CFR 302.4, the quantity released (0.002 lbs.) would be less than that substance's RQ.

- (5) One hundred pounds of RCRA "U" listed hazardous waste from a hazardous waste incinerator scrubber system are spilled onto gravel. The waste is estimated to contain, on a worst case basis, no more than 0.1 ppm benzene (0.00001 lb., RQ 10 lbs., RCRA U019), 4 ppm toluene (0.0004 lbs., RQ 1000 lbs., RCRA U220), 10 ppm trichloroethylene (0.001 lb., RQ 100 lbs., RCRA U228), 50 ppm sulfate (0.005 lbs., not a "listed" hazardous waste constituent), 1 ppm lead (0.0001 lb., RQ 10 lbs.), and the remainder is water. Other trace contaminants may be present, but do not exceed one lb. Has an RQ been released?

Although the quantities of each of the constituents of this waste stream are not known with certainty, a worst case estimate (presumably made on a sound technical

basis) is sufficient to indicate that all of the constituent quantities of this waste stream are well below their respective RQs. Therefore, based on the mixture rule, this release would not be reportable under CERCLA §103.

- (6) One hundred pounds of purge water from groundwater monitoring wells are spilled on the ground. The purge water was being managed as hazardous waste because it "contained" listed hazardous waste F-001 from a RCRA disposal site. Based on historical groundwater analyses of the monitoring wells producing the purge water, a worst case contaminant estimate is 5 ppm trichloroethylene (0.0005 lbs., RQ 100 lbs.), 10 ppm 1,1,1-trichloroethane (0.001 lb., RQ 1000 lbs.), 50 ppm nitrate (0.005 lbs., not a "listed" hazardous waste constituent). The RQ for F-001 hazardous waste with unknown constituents is 10 lbs., 100 lbs. for trichloroethylene F-001, and 1000 lbs. for 1,1,1-trichloroethane F-001. Has an RQ been released?

EPA made clear in the April 4, 1985, preamble (50 FR 13463) that the "mixture rule applies to ICR/TC wastes and to the RCRA F and K waste streams (all of which tend to be mixtures), if the concentrations of all the hazardous (constituents) in the waste are known." In this example, the concentrations of all the hazardous constituents are known, based on historical monitoring data, to be well below their respective RQs. Therefore, the release would not be reportable under CERCLA §103.

## Technical Assistance Available

For further information, please refer to the additional guidance that has been developed by the Office of Environmental Policy and Assistance (EH-41). Guidance can be located through the EH-41 World Wide Web at: <http://www.eh.doe.gov/oepa>. Many of the references used in developing this guidance document are also available at the website. In addition, the website provides access to the **RQ-CALCULATOR**, a computer software program designed to help estimate the amount of a hazardous substance or extremely hazardous substance (EHS) that has been released to the environment within a twenty-four hour period.

### References:

CERCLA Section 103 and EPCRA Section 304 Release Notification and Requirements Update, DOE/EH-0447, January 1995.

EH-231 Memorandum, January 10, 1990; Subject: Final Reportable Quantities of Radionuclides and Rules for Reporting Releases of Radionuclides under CERCLA.

Emergency Planning and Community Right-to-Know Act (EPCRA), DOE/EH-0181P, (OEG (CERCLA) 003/0291), March 1991.

Federal Environmental Reporting Requirements Handbook, EGD (CERCLA)-001/0590, May 1990.

Guidance for Federal Facilities on Release Notification Requirements Under CERCLA and SARA Title III, EPA 9360.7, U.S. Environmental Protection Agency/U.S. Department of Energy, November 1990.

Information Brief: CERCLA Reporting Requirements, DOE Occurrence Reporting, and the DOE Emergency Management System, EH-231-019/1093, October 1993.

Information Brief: EPCRA Requirements, EH-231-018/1093, October 1993.

Information Brief: Reporting Releases under CERCLA & EPCRA, EH-231-001/0490, April 1990.

Hazardous Substance Release Reporting under CERCLA, EPCRA Section 304, and DOE Emergency Management System/Occurrence Reporting Requirements, DOE/EH-0383, June 1994.

Reporting Continuous Releases of Hazardous and Extremely Hazardous Substances under CERCLA and EPCRA, DOE/EH-0441, January 1995.

*Questions of policy or questions requiring policy decisions will not be address in EH-41 Technical Assistance Projects unless that policy has already been established through appropriate documentation. Please refer any questions concerning the material covered herein to Richard Dailey, EH-413, at (202) 586-7117 and richard.dailey@eh.doe.gov*

