TREATMENT BY GENERATOR

TREATMENT-SPECIFIC GUIDANCE:

Solidification

WASHINGTON STATE DEPARTMENT OF ECOLOGY

Ecology Fact Sheet *Publication Number 96-416, Revised June, 1999*

This document may be used by generators interested in treating their own waste by solidification, on-site, in accumulation tanks or containers. Generators of hazardous waste who comply with these standards, and the standards in Technical Information Memorandum (TIM) #96-412, *Treatment by Generator*, will meet the requirements of the *Dangerous Waste Regulations*, Chapter 173-303 WAC.

This Fact Sheet provides guidance only for treatment by generator. If treatment is done according to this guidance document, a permit or other written approval is not necessary.

Description and Definitions

Solidification and stabilization technologies use additives to reduce the mobility and/or toxicity of pollutants. Wastes that are appropriately solidified and stabilized are acceptable under current land disposal and/or treatment requirements.

To properly implement this guidance, the following definitions apply:

Solidification

- A technique that physically limits the mobility of dangerous waste by reducing or eliminating free liquids in the waste.

Stabilization

- A technique that chemically limits the hazard potential of dangerous waste by converting the constituents into a less soluble form.

Applicability

Ecology encourages generators to use this Fact Sheet when they choose solidification as the method to remove free liquids from a dangerous waste to prepare it for permitted disposal. This Fact Sheet may also be used by generators preparing waste for storage, transport, incineration, further treatment or recycling; however, they are not required to meet the first two solidification-specific criteria in the "Criteria" section below of this Fact Sheet. This Fact Sheet is not applicable to wastes that are not specifically required to undergo stabilization by law or regulation.

In addition to the general limitations given above, use of this Fact Sheet is limited to dangerous waste which:

1) will not be left in place to be closed as a landfill,

2) remains a dangerous waste after solidification, and

3) will not change from an extremely hazardous waste (EHW) designation to a dangerous waste (DW) designation after solidification.

Ecology considers the management of waste streams that do not meet the first criterion below to be regulatory and technically complex and therefore will require a dangerous waste permit and/or closure plan. Waste streams that do not meet the last two criteria may be solidified, if solidification is not done for the purpose of dilution.

If the department determines that the treatment process poses a threat to public health or the environment, the generator may be required to obtain a treatment permit. If the treatment is part of a wastewater treatment operation [regulated by Permit by Rule (PBR)], or the waste is being treated to meet Land Disposal Restriction (LDR) standards, please see "Other Regulatory Requirements", below.

This document is intended solely as guidance. It addresses only the requirements of the *Dangerous Waste Regulations*. The generator is still ultimately responsible for complying with all applicable federal, state and local requirements relating to on-site waste management. Based on the analysis of specific site circumstances, Ecology officials may require a generator to manage their waste in a manner other than as specified in this guidance. Ecology may also revise this Fact Sheet at any time.

Criteria

The following criteria apply to treatment by generator solidification in addition to the guidance in TIM #96-412:

1) The solidified waste must pass the Paint Filter Liquids Test (PFLT). This test is specified as Method 9095 of the EPA document, Test Methods for Evaluating Solid Waste, Physical /Chemical Methods (Document Number SW-846) and assesses the amount of free liquid in the waste. All waste treated in accordance with this document must pass the PFLT. The generator must ensure that the solidification technique used can solidify all waste in the container or tank to this standard. In most cases, this will mean ensuring adequate mixing of the waste with the solidification material. A reduced-scale test must be successfully completed, using the actual waste and solidification material, before full-scale solidification can occur. The reduced-scale test must be

conducted in a manner similar to the procedure to be used during full-scale solidification.

2) The waste must be solidified using a non-biodegradable solidification material. Materials meeting this criteria, as well as test methods for assessing other materials, are found in the November 18, 1992, Federal Register (pages 54451-54461).

3) The following additional criteria should be considered depending upon the final treatment, storage, or disposal option utilized after solidification: Resistance to thermal cycling, wet/dry cycling, radiation exposure, chemical exposure, and compressive forces. Based upon the environment to which the final waste form will be exposed, some or all of these criteria may need to be assessed to ensure the integrity of the solidified matrix. The reduced-scale test must also demonstrate success with regard to any additional applicable criteria.

Other Regulatory Requirements

More detailed information concerning the requirements applicable to this guidance may be found in Technical Information Memorandum (TIM) #96-412, *Treatment by Generator*. Generators must assure compliance with all applicable sections of the *Dangerous Waste Regulations*, Chapter 173-303 WAC, such as proper designation of waste(s); accumulation, handling and labeling standards, reporting standards; spills and discharge requirements; etc. Reports must include the "wet" weight of the waste. Information on appropriate permit by rule and LDR requirements may be found in the TIM. In addition, the generator must comply with all other applicable federal, state and local regulations.

Case Example

Facility X in Washington generates 1,000 gallons of waste every month which designates as a dangerous waste for toxicity per WAC 173-303-100. The facility determines it is not possible to detoxify the waste and therefore wants to dispose the waste at a RCRA-permitted landfill in Oregon. The landfill operator informs Facility X that they cannot accept liquid waste for land disposal so the waste must be solidified.

Facility X realizes that if they follow Ecology's TIM #96-412 and the Fact Sheet, they can solidify their waste without a dangerous waste treatment permit. Facility X conducts some experiments with Portland cement and their waste to determine the most efficient liquid-to-solid ration and mixing technique. Although they plan to solidify their waste in 55-gallon drums, the experiments are done in 1-gallon pails. However, they add materials and stir the waste in the same way they will in 55-gallon drums. After three tries, they produce a waste form that passes the PFLT.

However, the landfill operator also told them that the waste may be buried as deep as thirty feet and so all incoming waste is required to have a compressive strength of 30 pounds per square inch. Therefore, Facility X has a local material laboratory test their solidified waste for compressive strength of 80 pounds per square inch. Therefore, Facility X has met the criteria of this Fact Sheet. Upon approval from the landfill to ship the waste, they begin full-scale solidification and remove their waste from the site every two months.

Ecology Assistance

For more information please contact a hazardous waste specialist at one of the following Ecology offices:

Northwest Regional Office	425-649-7000
Southwest Regional Office	360-407-6300
Central Regional Office	509-575-2490
Eastern Regional Office	509-456-2926
Industrial Section	360-407-6916
Nuclear Waste	360-407-7100

Ecology is an equal opportunity agency. If you have special accommodation needs, or require this document in alternate format, please call the Hazardous Waste and Toxics Reduction Program at (360) 407-6700 (Voice) or (360) 407-6006 (TDD).