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HAZARDOUS WASTE TREATMENT/STORAGE TANKS, PERMITTING

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MEMORANDUM

SUBJECT: Guidance on Permitting of Hazardous Waste Treatment/  
Storage Tanks

FROM: John M. Skinner, Director  
Office of Solid Waste

TO: Regional RCRA Branch Chiefs

This memorandum provides guidance to permit writers on several issues regarding permitting of hazardous waste treatment and storage tanks. Several of the current RCRA Subpart J standards, particularly the requirements for minimum shell thicknesses and periodic inspections, have been difficult to implement and have in some cases been resolved differently by the regional offices. Several regions have requested guidance on these regulatory requirements to provide a more consistent national approach to permitting RCRA regulated tanks.

The following guidance is applicable only to tanks permitted under the current Subpart J standards.

Establishing Minimum Shell Thicknesses

The current Subpart J standards require that a minimum shell thickness be specified in the permit for every regulated hazardous waste storage/treatment tank. This requirement applies to all tanks (except for covered underground tanks that cannot be entered for inspection), and it cannot be waived.

The current, actual shell thickness of each tank should be determined prior to the issuance of a draft permit. It is essential that the applicant demonstrate to EPA that the tank complies with all applicable standards before the decision is made to permit the tank. Current thickness data should be obtained from the pre-permit inspection, and included in the Part B application (see dis-

cussion below).

Several methods can be used to determine the appropriate minimum thickness for metal tank shells. Standards formulas can be used, such as the formula specified in the API Code 650. This formula (also presented in the early "Tommy Tank" guidance) should be used, however, only for very large (over 50,000 gallon capacity) non-pressurized metal tanks. For smaller metal tanks, the thicknesses prescribed in the UL 142 code can be used, even though this code is intended primarily for tanks storing ignitable liquids. Other codes for more specialized tanks, such as the ASME Section VIII code for pressure vessels, can also be used for certain types of tanks. It should be understood that the shell thicknesses prescribed in industry codes are minimum thicknesses to ensure structural integrity, and do not include allowance for corrosion.

The use of standard industry codes may not be practical for many metal tanks, such as irregularly shaped tanks, older tanks not built to standard codes, and others. In such cases, permit writers should specify a minimum thickness that is sufficient not only to contain the liquid contents, but also to withstand normal operational stresses and minor accidents (e.g., being hit by a forklift), without massive failure. Discussions with various industry officials have suggested that as a general rule, a metal shell thickness of 1/8" (0.125") is a satisfactory minimum thickness to provide an adequate degree of safety against normal operational contingencies (this thickness would not be sufficient, however, for pressurized tanks, or most large tanks of over 50,000 gallons capacity). Accordingly, it is recommended that the minimum shell thickness specified in RCRA permits for metal tanks be not less than 1/8". If a RCRA regulated tank is measured and found to have a shell thickness of less than 1/8", the permit writer should consider requesting that the applicant provide additional information (such as an engineer's certification) to demonstrate that the tank is structurally sound and can withstand normal operational stresses and minor accidents.

For fiberglass reinforced polyester (FRP) tanks, the standard formulas for determining shell thickness based on structural criteria, such as those used for metal tanks, are not appropriate. Structural strength of FRP tanks is more a function of how the tanks are manufactured (e.g., filament wound, fiber mat, etc.)

and the specific bonding resins used, rather than the thickness of the wall. In general, the primary concerns for FRP tanks are shell cracking (due to improper installation or other causes) and erosion of the resin layer of the interior tank wall surface. Each FRP tank should be inspected internally prior to permitting to determine if the inner resin layer is intact, or has deteriorated or eroded such that glass fibers are exposed. FRP tanks which exhibit deterioration of the inner resin layer, or other evidence of wall deterioration, should be repaired or taken out of service. For FRP tanks in good condition, an appropriate approach to establishing minimum shell thickness is simply to subtract a small amount from the actual measured shell thickness, to allow for possible construction irregularities and/or some limited erosion of the inner resin layer. This "allowance" should usually be 0.1" or less, since the inner resin layers of most fiberglass tanks as manufactured typically do not exceed 0.1".

Minimum shell thickness for concrete tanks can be established in a similar manner. Once the tank has been inspected for thickness can ???  
more than 10%) from the actual measured thickness of the tank wall. Existing concrete tanks in good condition can, with few exceptions, be presumed to have adequate "shell thickness", since concrete tanks are typically designed for substantially greater than normal anticipated structural stresses.

A primary concern with concrete tanks is possible migration of hazardous wastes through the walls of the tank. Concrete tanks should be lined or coated with a compatible material (even if the wastes are compatible with the concrete), unless the applicant can demonstrate that migration of wastes through the tank walls will not occur over the life of the tank.

### Tank Inspections

To ensure that regulated tanks are in compliance with applicable RCRA standards, each tank should be thoroughly inspected by the applicant or another firm hired for the purpose, prior to issuance of a draft permit. This initial inspection should involve draining the tank and examining the tank interior for leaks, cracks, corrosion, liner or coating failure and other signs of deterioration. The inspection should also include taking shell thickness measurements using ultrasonics or another

non-destructive test methods. Attachment A presents suggested methodologies for conducting ultrasonic shell thickness testing for both vertical and horizontal metal tanks. Ultrasonic and radiographic non-destructive testing must be performed by qualified personnel. If the applicant proposes to use his own personnel to perform such testing, he should be required to demonstrate that those persons are competent in the use of the test equipment, through course work or other training or experience.

The inspection plan required by §270.14(b)(5) must contain detailed procedures for conducting periodic, comprehensive inspections for each permitted tank, as required in §264.194(b). This periodic inspection should include a thorough inspection of the tank interior. The inspection plan should specify the procedures that will be used for emptying the tank, and the methods to be used in performing the inspection. If the internal inspection indicates evidence of significant corrosion, erosion or other deterioration which would lead to thinning of the tank wall to less than the minimum thickness prescribed in the permit, the inspection plan should specify that the applicant shall then perform shell thickness measurements according to a prescribed methodology.

The frequency of the comprehensive internal inspection should be established taking into account the age and general condition of the tank, the material of construction and relative compatibility with the wastes to be stored, waste temperature, and other relevant factors. It is recommended that the periodic inspections be performed at least once every two years, unless the applicant can demonstrate that a more lengthy interval is appropriate. More frequent inspections should be considered for some tanks, including: tanks storing or treating corrosive wastes, heated and/or pressurized tanks, tanks with relatively thin shells, fiberglass tanks, concrete tanks.

#### Tank Checklist

Attachment B is a checklist developed by Region I which can be a useful tool for permitting tanks. The checklist can be used by permit applicants as a format for presenting the required information for each tank to be permitted. It should be noted, however, that some of the data asked for in the checklist are not required by the regulations, and applicants should thus be

informed that use of the checklist is entirely optional. The checklist can be sent to applicants along with other appropriate guidance documents as part of the Part B call-in letter. Permit writers can also use the checklist as a means of organizing the information for each tank in the Part B application.

#### Attachments

cc: Regional Permits Section Chiefs

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PAT staff