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**Title:** Clarification of “Vault” And “Liner” Definitions

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**Dates Revised:** None

**Other Policies Repealed or Amended:** None

**Citations Affected:** None

**Brief Description of Subject Matter:** This document clarifies the difference between a vault and liner for tank secondary containment as defined in the hazardous waste regulations.

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### Clarification of “vault” and “liner” definitions

Under the hazardous waste rules, tanks which manage hazardous waste are, with a few exceptions, required to have secondary containment systems. The primary purpose of secondary containment is to allow detection of leaks from the primary or inner tank while providing a secondary barrier that prevents releases to the soil, groundwater and surface waters. Secondary containment also provides protection from spills caused by operational errors, such as overfilling. Secondary containment for tanks must include one or more of the following devices:

- Liners (external to tank)
- Vaults
- Double-walled tanks
- An equivalent device as approved by the IDEM.

The purpose of this analysis is to clarify the circumstances under which secondary containment for tanks is determined to be a “liner” versus a “vault” as defined in the hazardous waste rules. The distinction is important because design and operation standards differ, although the performance standard is the same. In other words, **whether the structure is a vault or a liner, it must prevent migration of wastes or accumulated liquid out of the system.**

Vaults generally are constructed of concrete and have an impermeable interior coating or lining that is compatible with the stored waste and that will prevent migration of waste into the concrete. It is important to note that **concrete is considered permeable**, and any concrete structure used as secondary containment must have a continuous impermeable barrier. If the structure has joints, they are required to have waterstops. Waterstops are integral (e.g. imbedded in the concrete) devices or an equivalent external system (e.g. battens with caulking or sealant system). Any new secondary containment structure should incorporate properly engineered integral water stops. Fractures in concrete must be managed to maintain an impermeable barrier. Vaults which are subject to hydraulic pressure must have an exterior coating to prevent migration of moisture into the vault. Vaults specifically must also be provided with a means to protect against the formation of and ignition of vapors. While the rules only apply this vapor protection standard to vaults, all tank systems in Indiana are subject to the Uniform Fire Code (UFC) which contains standards for managing ignitable and flammable material in tanks, and IDEM refers to the UFC to determine if vaults are in compliance with the vapor protection standard. For evaluation purposes, IDEM will note whether all hazardous waste tank systems, whether a vault or liner, comply with UFC standards. Referrals will be made to the State Fire Marshal's office when appropriate.

Liners in a traditional sense are generally constructed of low permeability natural material (such as clay) or of a synthetic membrane (such as polyvinyl chloride). For the purpose of complying with secondary containment requirements, a synthetic membrane or nonporous coating placed on a concrete structure may qualify the structure as a liner system. The coating or membrane is the actual liner, and the concrete is a support for the liner. However, it is important to note that many coatings are inadequate as a liner system. Liners must be free of cracks and gaps and of sufficient thickness to prevent release of wastes. Unless coatings are applied in sufficient thickness, and are able to withstand dynamic forces such as concrete movement, they would not qualify as a liner. The presence of fractures through a coating, or gaps where sealants are used, is generally an indication that the coating is inadequate and the structure does not meet the definition of a liner system. The department has found that most thin paint-like coating materials are inadequate as a liner. Other examples of liners would be plastic, fiberglass or steel containment systems that are free of cracks and gaps and are compatible with the waste.

Again using an example, a common structure used for tank secondary containment is a coated on-grade concrete floor with coated concrete walls. There are typically joints between the walls and floor and within the floor itself. If the coating provides a continuous barrier free of cracks and gaps, including over all the joints, it would be appropriate to consider the structure as a liner. If, however, there are gaps and cracks at the joints or in sealant interfaces at the joint, but the coating serves as an impermeable coating for the concrete, the structure would be considered a vault and the joints should be evaluated for adequate waterstops. If the coating has obvious, systematic and routine fractures and cracks, or there are other indications that the coating is unable to withstand other stresses which are present, it probably doesn't meet the definition of a liner system and may not be adequate as a vault. In any case, the tank system would be subject to applicable fire codes.

It will often be necessary to evaluate structures on a case-by-case basis to determine if the intent of the regulations is being met. Good professional judgement must be relied on in many cases.

Because every site is unique, some factors or situations concerning tank secondary containment management may not be addressed in this guidance document. **If you need additional information, or have any questions or concerns, please contact staff of the Compliance Branch, Office of Land Quality, at 317-234-6923. The IDEM toll-free telephone number is 1-800-451-6027.**