

Kansas Administrative Regulations

Department of Health and Environment

Article 45.—Underground Hydrocarbon Storage Wells and Associated Brine Ponds

28-45-28. Brine pond; construction requirements.

(a) Each permittee that wants to construct and operate a new brine pond or reconstruct an existing brine pond shall submit a design and construction plan for each brine pond to the secretary with the request for a permit modification, at least six months before construction begins. Each brine pond shall be designed by a professional engineer. Construction shall not begin until the secretary has issued a permit modification.

(b) Each permittee shall ensure that the impermeable synthetic membrane liner system for each brine pond is comprised of primary and secondary impermeable synthetic membrane liners with an intermediate leak detection system. The following requirements shall apply:

(1) The primary and secondary liners shall be at least 30 mils in thickness.

(2) The professional engineer designing the brine pond shall obtain a certification from the liner manufacturer providing the following information:

(A) Confirmation that the specified liner is compatible for use with saturated brine;

(B) confirmation that the specified liner is ultraviolet-resistant; and

(C) the manufacturer's estimated leakage, permeability, or transmissivity rate of the specified liner expressed in units of volume per area per unit of time (gallons per square feet per day) for an installed liner. The leakage, permeability, or transmissivity rate shall reflect the expected rate of movement of fluids through an impermeable synthetic membrane liner when considering the properties of the liner material, liner thickness, normally expected manufacturing defects in the liner material, and normal expected defects associated with the seaming and installation process.

(c) Each permittee shall ensure that the primary and secondary impermeable synthetic membrane liners for each brine pond are separated to provide a conduit for

the movement of any fluid between the liners to the leak detection monitoring location for detection and removal.

(d) Each permittee shall ensure that each brine pond is constructed with an impermeable synthetic membrane liner system with a maximum liner leakage rate that is less than the more stringent of either of the following:

- (1) A maximum monitored or calculated seepage rate of 1/64 inch per day; or
- (2) the liner manufacturer's criteria for the material and installation of the impermeable synthetic membrane liner system expressed in units of volume per area per unit of time (gallons per square feet per day).

(e) Each permittee shall ensure that all materials between the primary and secondary liners are capable of transmitting at least 1/64 inch per acre per day of flow with a head of no more than two feet placed on the secondary liner. Acceptable materials shall include the following:

- (1) Clean sand;
- (2) pea gravel;
- (3) geosynthetic product; and
- (4) any alternatives recommended by the liner manufacturer, if the secretary determines that the alternatives are substantially equivalent to the materials listed in this subsection.

(f) Each permittee shall ensure that the leak detection system design for each brine pond limits the maximum travel time required for fluid penetrating the liner to reach the leak detection monitoring location to 24 hours or less.

(g) Each permittee of a brine pond constructed or reconstructed after the effective date of this article of the department's regulations shall ensure that each brine pond bottom has a slope adequate for the operation of the leak detection system with at least a 1.0 percent slope for the collection pipes and 2.5 percent for all other slopes.

(h) Each permittee of a brine pond constructed or reconstructed before the effective date of this article of the department's regulations shall ensure that each brine pond bottom has a slope adequate for the operation of the leak detection system with at least a 0.5 percent slope for the collection pipes and 1.0 percent for all other slopes, as specified in this regulation.

(i) Each permittee shall ensure that the dewatering system design for each brine pond is capable of the following:

(1) Monitoring the volume of fluid removed from the intermediate space between the primary and secondary liners; and

(2) pumping the volume of fluid generated equal to 10 times the maximum allowable liner leakage rate.

(j) Each permittee shall ensure that the compaction of all brine pond embankments and of the upper six inches of the interior lagoon bottom below the secondary liner meets all of the following requirements:

(1) The standard proctor density shall be at least 95 percent at optimum moisture to optimum moisture plus three percent.

(2) The thickness of each layer of the compacted material shall be six inches or less.

(3) The moisture content range of the compacted soils shall be optimum moisture to optimum moisture plus three percent.

(4) The size of dirt clods in the compacted soil shall be one inch or less in diameter.

(k) Each permittee shall ensure that the following requirements for the installation of the liners at each brine pond are met:

(1) The primary and secondary liners shall be anchored at the top of the brine pond dike in accordance with the liner manufacturer's instructions.

(2) Installation shall be performed in accordance with the liner manufacturer's instructions.

(3)(A) Installation shall be performed by a contractor experienced in the installation of impermeable synthetic membrane liners.

(B) On-site supervision of the liner installation shall be provided by an individual who has experience in liner installation practices.

(l) Each permittee shall submit, to the secretary, a seam testing method to verify the adequacy of the seaming process for the liners at each brine pond. The following requirements shall apply:

(1) The testing method shall include the following:

(A) The methods for destructive and nondestructive seam testing;

(B) the protocol describing the number of tests per lineal foot of field seam;

(C) the size of the destructive test specimen required; and
(D) other pertinent quality control provisions recommended by the liner manufacturer.

(2) All field seams shall be subjected to nondestructive testing.

(m) Each permittee shall install a gas vapor control system to ignite or capture hydrocarbon vapors at each brine pond, unless a variance is granted by the secretary. The gas vapor control system shall consist of one of the following:

(1) A hydrocarbon liquid knockout vessel and degasifier; or

(2) an alternative method if the secretary determines that the alternative method is substantially equivalent to the hydrocarbon liquid knockout vessel and degasifier.

(n) Each permittee shall submit a final report for each new or reconstructed brine pond within 90 days of construction completion. The report shall include the following:

(1) Certification signed by a professional engineer, and if requested, any supporting documentation, confirming that the brine pond and impermeable synthetic membrane liner system were constructed in accordance with the plans and specifications approved by the secretary;

(2) the results of the postconstruction testing of the impermeable synthetic membrane liner system;

(3) certification signed by a professional engineer confirming that the impermeable synthetic membrane liner system complies with the maximum impermeable synthetic membrane liner leakage rate; and

(4) a final as-built of the new or reconstructed brine pond.

(o) Each permittee shall immediately cease operations or shall comply with instructions from the secretary if the secretary determines that an imminent threat to public health, safety, or the environment due to any unsafe operating condition exists. The permittee may resume operations if the secretary determines that the brine pond operations no longer pose a risk to public health, safety, or the environment.

(Authorized by and implementing K.S.A. 2023 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003; amended Aug. 9, 2024.)