Kansas Administrative Regulations

Department of Health and Environment

Article 16.—Water Pollution Control—Municipal, Commercial and Industrial Wastewater Lagoon Requirements.

28-16-167. Requirements for impermeable synthetic membrane liners in industrial wastewater treatment system lagoons.

(a) The following requirements shall apply to industrial impermeable synthetic membrane liners:

(1) The impermeable synthetic membrane liner system shall be comprised of primary and secondary impermeable synthetic membrane liners with an intermediate leak detection system provided.

(2) Each primary and secondary liner shall be at least 30 mils (0.030 inch) in thickness.

(3) The licensed professional engineer designing the wastewater lagoon shall obtain a certification from the liner manufacturer that includes the following:

(A) Confirmation that the specified liner is compatible for use with the proposed wastewater to be retained or treated;

(B) confirmation that the specified liner is resistant to UV (ultraviolet) light; and

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

(b) A minimum of two cells shall be provided to allow for flexibility of operation and maintenance of the wastewater lagoon system. This requirement may be waived by the secretary if an approved alternative wastewater disposal option is available and the operator agrees to employ the alternative wastewater disposal option when the

wastewater lagoon system is required to be dewatered. Each approved alternative wastewater disposal option shall include a means of disposal for which the required permits, licenses, or authorizations have been obtained.

(c) The primary and secondary liners shall be separated to provide a conduit to allow the movement of any fluid between the liners so that the fluid can be directed to the leak-detection monitoring location for detection and removal. Clean sand, pea gravel, geotextile fabric, and geonet-type materials may be employed to provide the required separation between the primary and secondary liners if a conduit allowing for fluid movement to the leak-detection monitoring location is provided. Alternatives may be recommended by the liner manufacturer or design engineer and shall be submitted to the secretary for review and consideration for approval.

(d) The secondary liner in the pond bottom shall have at least a 2.5 percent slope towards the leak-detection system's monitoring sump, manhole, observation pipe, or other similar leak-detection monitoring mechanism. Any piping used to collect or route fluids to the leak-detection monitoring mechanism shall have at least a one percent slope. The leak-detection system design shall ensure that the maximum travel time required for fluid penetrating the liner to reach the leak-detection monitoring location is 24 hours or less.

(e) The design of the impermeable synthetic membrane liner system shall provide for the capability to perform the following:

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

(2) pump a volume of fluid generated that is equal to 10 times the maximum synthetic membrane liner leakage rate; and

(3) collect a representative sample of fluid being pumped.

(f) Compaction of the wastewater treatment lagoon embankments and upper six inches of the interior lagoon bottom below the secondary liner shall be a minimum of 95 percent of the maximum standard proctor density at optimum moisture to optimum moisture plus three percent. The maximum thickness of the layers of material to be compacted shall not exceed six inches. The moisture content range of the soils being compacted shall be optimum moisture to optimum moisture plus three percent. The

maximum size of dirt clods in the compacted soil shall be less than one inch in diameter.

(g) The primary and secondary liners shall be anchored at the top of the wastewater lagoon dike. The method of anchoring the primary and secondary liners shall conform to the manufacturer's installation instructions.

(h) The liner shall be installed in accordance with the liner manufacturer's instructions. Either the liner shall be installed by a contractor experienced in the installation of impermeable synthetic membrane liners, or the contractor shall provide for the on-site supervision of the liner installation by an individual that has experience installing liners.

(i) The construction plans and specifications shall include provisions for the use of a reliable seam-testing method that shall be used to verify the adequacy of the seaming process. The methods for destructive and non-destructive seam testing shall be specified, along with detailed procedures describing the number of tests per lineal foot of field seam, the size of the destructive test specimen required, and any other pertinent quality control provisions recommended by the liner manufacturer. All field seams shall be subjected to non-destructive testing.

(j) The Kansas "minimum standards of design for water pollution control facilities" shall be utilized in the design and the establishment of construction criteria for wastewater lagoons, unless different criteria are specified in K.A.R. 28-16-160 through K.A.R. 28-16-174. If there is any difference between the design and construction criteria specified in K.A.R. 28-16-160 through K.A.R. 28-16-174 and either the Kansas "minimum standards of design for water pollution control facilities" or regulations in articles 5, 13, or 30, the design and construction criteria specified in K.A.R. 28-16-160 through K.A.R. 28-16-174 shall control.

(k) A minimum of two feet of in situ or compacted soil shall be provided beneath the bottom of the secondary liner or liner bedding material.

(l) Each applicant or permittee shall develop and submit with the construction plans and specifications a contingency plan, for the secretary's review and consideration for approval, that outlines procedures for pond containment and operation during periods of

maintenance and periods of required dewatering if a liner fails or needs to be repaired or replaced.

(m)(1) Each permittee shall immediately cease operations or shall comply with the instructions of the secretary, if the secretary determines that an imminent threat or the potential for an imminent threat to public health or the environment exists due to any unsafe operating condition. Considerations regarding an imminent threat or the potential for an imminent threat to public health or the environment shall include the following:

(A) The pollutant or pollutants involved;

(B) the integrity of the impermeable synthetic membrane liner;

(C) the depth to groundwater;

(D) the monitoring well or water supply well data;

(E) the mobility of the pollutant or pollutants through soil or groundwater;

(F) the potential exposure to the public; and

(G) the potential for uncontrolled release into the environment.

(2) The permittee may resume operations if the secretary determines that the wastewater lagoon no longer poses a risk to public health and the environment. (Authorized by K.S.A. 2004 Supp. 65-171d and K.S.A. 65-171h; implementing K.S.A. 65-164, K.S.A. 65-165, K.S.A. 65-166, K.S.A. 2004 Supp. 65-171d, and K.S.A. 65-171h; effective May 20, 2005.)

***** Authenticated Kansas Administrative Regulation *****