

# **Attachment**

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# State of Kansas

Mike Hayden, Governor

## Department of Health and Environment Division of Environment

Stanley C. Grant, Ph.D., Secretary

Forbes Field, Bldg. 740, Topeka, KS 66620-0002

(913) 296-1535  
FAX (913) 296-6247

Policy Memorandum #90-2  
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FROM: Karl W. Mueldener, P.E.  
Director, Bureau of Water

A handwritten signature in black ink, appearing to read "Karl W. Mueldener".

SUBJECT: INDUSTRIAL WASTEWATER POND LINER POLICY

### PURPOSE:

This document states the Bureau of Water (Bureau) policy for requirements relating to industrial wastewater ponds. This policy is intended to protect the water and soil resources from a significant risk of contamination posed by earthen lagoons utilized for the containment/treatment of industrial wastewater and to provide minimum standards for the design and construction of new industrial wastewater ponds and the retrofitting of existing earthen lagoons.

### BACKGROUND:

The Bureau of Water administers the Kansas Water Pollution Control Permit program established by K.S.A. 65-164 and 65-165. Wastewater ponds which discharge to surface waters or total retention through the use of evaporation, irrigation or recycle are addressed by this program. The Department has responsibilities under K.S.A. 65-171d to prevent subsurface water pollution and soil pollution. An increased emphasis, at both the state and federal level, has been placed on addressing source control as a mechanism for preventing or minimizing groundwater contamination. Since groundwater contamination from earthen ponds has been documented, the Bureau concludes construction of new industrial wastewater ponds without impermeable liner/leak detection systems represent an unnecessary risk of polluting groundwater and soils.

### POLICY:

Any new or modified wastewater ponds designed and constructed for the containment or treatment of industrial wastewater, for other than non-contact cooling water or conventional domestic-type wastewater shall meet the following requirements:

1. The pond shall have a primary and secondary liner with an intermediate leak detection system.
2. The primary liner shall be at least 30 mil in thickness.
3. The secondary liner shall also be at least 30 mil in thickness, or, depending on the situation, other alternatives may be approved on a case by case basis.
4. Compaction of the pond embankments and upper 12 inches of the interior bottoms below the secondary liner shall be a minimum of 95% of the maximum standard proctor density. The maximum thickness of the layers of material to be compacted shall be 6 inches. The moisture content range shall be optimum moisture to optimum moisture + 3%. The maximum size of dirt clods in the compacted soil shall be less than one inch diameter.

5. A minimum of two cells must be provided to allow flexibility in operation/maintenance of the pond system. This requirement may be waived if approved wastewater disposal options are available when the pond needs to be dewatered.
6. The primary and secondary liners shall be separated by a permeable material (clean sand or pea gravel having a particle size of less than 1/4 inch in diameter). At least ten (10) inches of sand shall separate the liners on the pond bottom and either six (6) inches of sand or a geotextile fabric shall separate the liners on the slopes.
7. A statement from the liner manufacturer shall be submitted stating the liner is UV resistant and compatible with the wastewater to be contained/treated.
8. A statement from the liner manufacturer shall be submitted stating the permeability of the liner in units of volume/area/time, e.g. gallon/square feet/day.
9. The leak detection pipe(s) shall be placed in a trench to enhance collection of leachate. There should be perforations in the pipe(s), preferably between the 4 or 5 o'clock and 7 or 8 o'clock positions. The pipe(s) shall be wrapped in geotextile fabric to prevent plugging of openings in the pipe(s) by the fine granular material placed between the liners.
10. The pond bottom shall have at least a 2.5% slope to the leak detection pipe(s). The leak detection pipe(s) shall have at least a 1.0% slope to an observation pipe, sump, manhole or other similar structure.
11. The primary and secondary liners shall be anchored at the top of the dike. The liners shall overlap the dike in a U or L-shaped fashion and then be backfilled with soil.
12. The liner shall be installed in accordance with the liner manufacturer's recommendations and by a contractor experienced in synthetic liner installation (at least 10 million square feet of liner previously installed by the contractor is recommended). It is recommended the liner installation be supervised by a representative of the liner manufacturer.
13. A reliable seam testing method shall be used to verify there are no leaks in seams or seals. The methods of destructive and non-destructive seam testing shall be specified. The number destructive tests per linear foot of field seam, and the size of the destructive test specimens shall be specified. All field seams shall be subjected to non-destructive testing.
14. The Kansas Minimum Standards of Design for Water Pollution Control Facilities shall be followed for compaction requirements, slopes, embankment top width, freeboard and any other general wastewater pond construction criteria.

These liner requirements are not applicable for the containment/treatment of hazardous wastes. The Department's Bureau of Air and Waste Management-Hazardous Waste Section should be contacted for hazardous waste requirements.

EFFECTIVE DATE:

The above policy will be in effect on September 18, 1990, and will remain in effect until withdrawn, revised, or modified by the Director.