401 KAR 48:208. Petroleum-contaminated soil treatment facility liner high-permeability layer quality assurance and quality control.

RELATES TO: KRS 224.01, 224.10, 224.40, 224.43, 224.99, 322.010(16)
STATUTORY AUTHORITY: KRS 224.10-100, 224.40-100(19)(c), (24), (28), 224.40-305
NECESSITY, FUNCTION, AND CONFORMITY: KRS 224.40-100(19)(c), (24), and (28) requires the cabinet to promulgate rules and administrative regulations for the permitting, management, processing, or disposal of wastes. KRS 224.40-305 requires that persons engaging in the management, processing, and disposal of waste obtain a permit. This administrative regulation establishes the liner quality assurance and quality control testing requirements for petroleum-contaminated soil treatment facilities.

Section 1. Definitions.(1) "Certifying engineer" means "professional engineer," as defined by KRS 322.010(3), who implements the petroleum-contaminated soil treatment facility construction quality assurance plan.

(2) "Petroleum-contaminated soil" means silt, sand, clay, gravel, or other earthen material; or asphalt, concrete, or absorbent materials containing hydrocarbon concentrations above the levels established in 401 KAR 48:205, Section 6, Table 3, but does not exhibit a hazardous characteristic or is not a listed hazardous waste as defined in 401 KAR Chapter 31.

(3) "Petroleum-contaminated soil treatment facility" means a solid waste site or facility where petroleum-contaminated soil is treated to reduce contaminant concentrations to or below the levels established in 401 KAR 48:205, Section 6, Table 3.

(4) "Quality assurance" means the procedures that are initiated by the owner or operator and implemented by the professional engineer to ensure that the construction of the petroleum-contaminated soil treatment facility meet design specifications and performance requirements.

(5) "Quality control" means the system of control implemented by the manufacturer, fabricator, installer, construction contractor, operator, or other person in order to meet construction specifications for the construction of the petroleum-contaminated soil treatment facility.

Section 2. Applicability. (1) The quality assurance and quality control requirements of this administrative regulation shall apply to the construction of liners for biopiles at petroleum-contaminated soil treatment facilities.

(2) The liner design requirements for biopiles shall be as established in 401 KAR 48:205, Section 3 for petroleum-contaminated soil treatment facilities.

Section 3. Specific Precipitation Drainage, Leachate Collection, or Gas Collection High Permeability Soil Requirement. (1) The high permeability soil is the sand or gravel that shall be used for the leachate collection layer on the biopile liner at a petroleum-contaminated soil treatment facility.

(a) High permeability soil components shall have a minimum coefficient of permeability of 1×10^{-3} centimeters per second.

(b) The soil shall be placed without damaging the collection and removal system or liner components.

(c) The soil material shall be processed and substantially free of tree roots, wood, or other decayable materials and large rocks.

(d) High permeability soil components shall be resistive to leachate, so that clogging of the layer shall not cause the hydraulic head on the liner to exceed twelve (12) inches in depth.

(2) Certification requirements. (a) The certifying engineer shall include in the form DEP

8064, Construction Progress Report for a Petroleum Contaminated Soil Treatment Facility, as incorporated by reference in 401 KAR 47:205, Section 10, a discussion of quality assurance and quality control testing.

(b) The testing procedures and protocols shall be ASTM International, or other test method based on the applicable standards of practice as established in KRS 322.010(16) for certification by a professional engineer.

(c) The results of testing shall be included in the form DEP 8064, Construction Progress Report for a Petroleum Contaminated Soil Treatment Facility, as incorporated by reference in 401 KAR 47:205, Section 10, including documentation of failed test results, descriptions of the procedures used to correct the improperly installed material, and statements of retesting performed in accordance with the following requirements:

1. The certifying engineer shall review the results of the quality control testing by the supplier of a high permeability soil component;

2. The quality control and quality assurance testing shall ensure that the specified material complies with the permeability and clogging preventive requirement of subsection (1)(d) of this section;

3. The following quality control tests shall be performed on a minimum of at least one (1) sample from each soil classification:

a. Classification of soils for engineering purposes using the following:

(i) Soil particle size; and

(ii) Insoluble residue or calcium carbonate content; and

b. Hydraulic conductivity.

(d) Quality assurance testing included in paragraph (b) of this subsection shall be compared to and evaluated against the quality control testing of paragraph (a) of this subsection based on the applicable standards of practice as established in KRS 322.010(16) for certification by a professional engineer.

(e) Quality assurance testing shall be based on the applicable standards of practice as established in KRS 322.010(16) for certification by a professional engineer and shall be performed at the following minimum frequency for each soil classification:

1. One (1) analysis of soil particle size for every 10,000 cubic yards of soil material;

2. One (1) analysis of soil classification for engineering purposes for each 20,000 cubic yards of soil material;

3. One (1) insoluble residue in carbonate aggregates test, for every 20,000 cubic yards of soil material using D3042-03, Standard Test Method for Insoluble Residue in Carbonate Aggregates modified for a pH of no greater than four and zero-tenths (4.0) or similar test based on the applicable standards of practice as established in KRS 322.010(16) for certification by a professional engineer; and

4. One (1) hydraulic conductivity test for every 20,000 cubic yards of soil material.

(f)1. The completed form DEP 8064, Construction Progress Report for a Petroleum Contaminated Soil Treatment Facility, as incorporated by reference in 401 KAR 47:205, Section 10, shall show the finished elevation of each high permeability soil component of the liner referenced to existing site control, using a Three (3) Dimensional Terrain Model on Computer Assisted Design Drawing (CADD), cross-section, or another method of equivalent accuracy and quality; and

2. These finished elevations shall serve as documentation and reference data for future volume calculations.

Section 4. Specific Synthetic Drainage Layer (SDL) Requirements for Bottom Liners. A Synthetic Drainage Layer (SDL) shall have an allowable flow rate equivalent to the design re-

quirements of the leachate collection layer as established in Section 2 of this administrative regulation.

(1) Materials required. (a) The SDL shall have an allowable flow rate that meets the requirements of this administrative regulation as determined by GRI standard GC-8 Determination of the Allowable Flow Rate of a Drainage Geocomposite or similar method based on the applicable standards of practice for certification by a professional engineer as established in KRS 322.010(16).

(b) The SDL shall not be adversely affected, chemically or physically, by waste placement or leachate.

(c)1. Documentation shall be submitted to ensure chemical compatibility of the SDL chosen; or

2. In the absence of the appropriate documentation, chemical compatibility testing shall be performed using Method 9090A, Compatibility Test for Wastes and Membrane Liners, SW-846 Update IV of the Third Edition, which is incorporated by reference in 401 KAR 48:205, Section 10; or ASTM D6388-99 (2005), Standard Practice for Tests to Evaluate the Chemical Resistance of Geonets to Liquids, or other similar test method based on the applicable standards of practice as established in KRS 322.010(16) for certification by a professional engineer.

(2) Construction requirements. (a) The SDL shall be installed in accordance with the requirements of the approved engineering plans, reports, and specifications in the permit and manufacturer's recommendations.

(b) The certifying engineer shall ensure that the SDL installation, at a minimum, shall conform to the following:

1. The SDL shall have a nominal thickness that is specified by the professional engineer to meet the design flow of the leachate collection as established in 401 KAR 48:205, Section 3;

2. The SDL shall have a transmissivity that is specified by the professional engineer to comply with the design flow of the leachate collection layer as established in 401 KAR 48:205, Section 3;

3. The SDL shall be designed to withstand the calculated tensile forces acting upon the SDL to ensure that stability shall be maintained;

4. The anchor trench shall be designed to withstand the calculated tensile forces acting upon the SDL to ensure that stability shall be maintained;

5. Field seams shall be oriented parallel to the line of maximum slope, which is oriented along, not across the slope; and

6. In corners and irregularly-shaped locations, the number of field seams shall be minimized.

(3) Certification requirements.

(a) The certifying engineer shall include in the form DEP 8064, Construction Progress Report for a Petroleum Contaminated Soil Treatment Facility, as incorporated by reference in 401 KAR 47:205, Section 10, a discussion of the reviewed data resulting from the quality assurance and quality control testing.

(b) The results of testing shall be included in the form DEP 8064, Construction Progress Report for a Petroleum Contaminated Soil Treatment Facility, as incorporated by reference in 401 KAR 47:205, Section 10, including documentation of failed test results, descriptions of the procedures used to repair the failed material, and documentation of retesting performed.

(c) The certifying engineer shall certify, after review of the quality control testing of the SDL, if the material meets the requirements of the approved engineering plans, reports, and specifications in the petroleum-contaminated soil treatment facility permit.

(d) Before installing an SDL, the following information shall be available to the certifying engineer for approval:

1. Origin and identification of the raw materials used to manufacture the SDL;

2. Copies of quality control certificates issued by the producer of the raw materials used to manufacture the SDL; and

3. Reports of tests conducted to verify the quality of the raw materials used to manufacture the SDL.

(e) Tests shall be performed using appropriate ASTM International, GRI or other similar specifications based on the applicable standards of practice as established in KRS 322.010(16) for certification by a professional engineer.

(f)1. The certifying engineer shall verify through appropriate documentation that the quality control testing of an SDL made at the factory took place in accordance with the manufacturer's quality control plan, which is based on the GRI standard GC-8 Standard Guide for Determination of the Allowable Flow Rate of a Drainage Geocomposite or appropriate specifications based on the applicable standards of practice as established in KRS 322.010(16) for certification by a professional engineer.

2. Quality assurance testing performed under the supervision of the certifying engineer shall assure conformity of the SDL with the approved engineering plans in the permit and the GRI standard GC-8 Standard Guide for Determination of the Allowable Flow Rate of a Drainage Geocomposite or appropriate specifications based on the applicable standards of practice as established in KRS 322.010(16) for certification by a professional engineer.

Section 5. Incorporation by Reference. (1) The following material is incorporated by reference:

(a) ASTM D3042-03 "Standard Test Method for Insoluble Residue in Carbonate Aggregates", modified for a pH of no greater than 4.0, July 2002;

(b) GRI standard GC-8 "Standard Guide for Determination of the Allowable Flow Rate of a Drainage Geocomposite", April 2001; and

(c) ASTM D6388-99(2005) "Standard Practice for Tests to Evaluate the Chemical Resistance of Geonets to Liquids", June 2005.

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(3) This material may also be obtained at:

(a) ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA, 19428-2959 USA, or from their Web site at http://www.astm.org/index.shtml

(b) Geosynthetic Research Institute, 475 Kedron Avenue, Folsom, PA 19033-1208 USA, or from their Web site at http://www.geosynthetic-institute.org/ (37 Ky.R. 2795; 38 Ky.R. 564; eff. 10-6-11; TAm eff. 7-8-2016.)