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3745-520-302

Permit to install - facility design plan.

[Comment: For dates of non-regulatory government publications, publications of recognized organizations and associations, test methods, federal rules, and federal statutory provisions referenced in this rule, see rule 3745-500-03 of the Administrative Code titled "Incorporation by reference."]

(A) General facility design plan requirements.

- (1) The facility design plan shall include the drawings, calculations, and narrative necessary to demonstrate the following:
 - (a) That the C&DD facility conforms to the applicable siting criteria in rule 3745-520-100 of the Administrative Code.
 - (b) That the applicable design requirements for engineered components and systems of engineered components specified in rule 3745-520-200 of the Administrative Code are satisfied.
- (2) When present or proposed at the C&DD facility, the elements and features listed in this rule shall be included in the facility design plan.
- (3) If narrative is necessary to explain a drawing or a calculation, the narrative shall appear with the drawing or calculation.
- (4) The facility design plan shall be signed and sealed by a professional engineer.
- (5) All survey information included in the facility design plan shall be signed and sealed by a professional surveyor.
- (6) The facility design plan shall establish a grid system. The grid system shall be referenced to a permanent survey mark at the C&DD facility.

(B) General drawing requirements.

- (1) Drawings shall appear on plan sheets with minimum dimensions of twenty-four inches by thirty-six inches.
- (2) Each plan drawing required by paragraphs (C)(2) and (C)(3) of this rule shall include and identify the following:
 - (a) The C&DD facility boundary.
 - (b) The horizontal disposal limits encompassing and showing the following:

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(i) Areas of disposed material. The applicant may determine the location of disposed material using existing surveys. If the applicant does not have survey results, the applicant shall use the results of a field investigation to provide justification of the delineation of disposed material.

(ii) Areas previously authorized for material disposal where no material has been disposed and which the applicant wants to use for disposal.

(iii) Areas not previously authorized for material disposal that are proposed to be used for disposal.

(c) Roads, railroads, and structures built by humans, including the locations of maintenance buildings, weighing facilities, and storage buildings.

(d) Existing topography showing surface waters and wetlands with a contour interval no greater than five feet.

(e) The north arrow.

(f) Grid lines a maximum of five hundred feet apart.

(g) A legend with information necessary to understand the drawing.

(h) The scale of the drawing.

(C) Facility design plan contents. The facility design plan shall include the following:

(1) A plan drawing cover sheet. The plan drawing cover sheet, to be numbered sheet 1, shall contain the following information:

(a) The name of the C&DD facility.

(b) The precise geographic location of the C&DD facility boundary and of the horizontal disposal limits shown on a road map which includes the area within a five mile radius of the facility boundary with a scale of one inch equals no greater than one mile.

(c) The name, mailing address, and telephone number of the applicant.

(d) The name, mailing address, and telephone number of the C&DD facility owner, if an owner exists.

(e) The name, mailing address, and telephone number of the C&DD facility operator, if an operator exists.

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(f) The name, mailing address, and telephone number of each titleholder of each tract of land to be used for the C&DD facility.

(g) The name, mailing address, and telephone number of the professional engineer signing and certifying the plans.

(2) Drawings showing the C&DD facility environs and compliance with siting criteria. Plan drawings shall show the following items that are within the area that includes the C&DD facility and all property within five hundred feet of the facility boundary. The items shall be illustrated on a series of plan drawings numbered consecutively 2A, 2B, 2C, etc. Items specified in paragraphs (C)(2)(c)(i) to (C)(2)(c)(iii) shall be shown on the same plan drawing, or a note shall be on the plan sheet stating the item does not exist. An individual plan drawing may contain information specified in more than one subparagraph. The scale on these drawings shall be one inch equals no greater than two hundred feet.

(a) Oil wells and gas wells with type, depth, and status noted for each one.

(b) The location of the boundaries of the one hundred year flood plain, as those boundaries are either shown on the applicable maps prepared under the National Flood Insurance Act of 1968, or are calculated by the applicant.

[Comment: The required calculation methodologies and the requirement to include any flood plain calculations in the facility design plan are established in paragraph (C)(6)(m) of this rule.]

(c) The location of following surface waters:

(i) Perennial streams as depicted on a USGS 7.5-minute (topographic) map.

(ii) Wetlands, with category 3 wetlands identified.

(iii) Lakes and reservoirs of one acre or more that are hydrogeologically connected to ground water. For the purpose of this rule, a lake or reservoir does not include a body of water constructed and used for purposes of surface water drainage or sediment control.

(d) The location of the boundaries of the sole source aquifer designated by the administrator of the United States environmental protection agency under the Safe Drinking Water Act.

(e) The location of residential and public water supply wells. Each well shall be identified as a residential or public water supply well. The applicant shall note each person that controls each well.

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- (f) The limits of all drinking water source protection areas for a public water system using ground water including the area surrounding a public water supply well that will provide water from an aquifer to the well as delineated or endorsed by Ohio EPA under Ohio's wellhead protection and source water assessment and protection programs.
- (g) The presence and presumed limits of an unconsolidated aquifer system capable of sustaining a yield of at least one hundred gallons per minute for a twenty-four-hour period.
- (h) The location of parks, natural areas, nature preserves, and wildlife areas and refuges.
- (i) The location of a state forest purchased or otherwise acquired under Chapter 1503. of the Revised Code.
- (j) The location of land that is placed on the state registry of historic landmarks under section 149.55 of the Revised Code.
- (k) The location of occupied dwellings and the areas of the facility where the main hauling road may be located.
- (l) The basal and final elevations of the isolation material located under the disposal limits.
- (m) An isopach showing the difference between the basal and final elevations of the isolation material located under the disposal limits.
- (n) The location of tracts of land showing the property lines and titleholders of each tract.
- (o) The tracts of land upon which an applicable zoning resolution allows residential construction. The drawing shall be cross referenced to the copies of the applicable zoning resolutions required to be included in the permit to install application by rule 3745-520-300 of the Administrative Code. If there are no applicable zoning resolutions, make a note on the plan sheet.
- (3) Drawings showing the C&DD facility design. Plan drawings shall show the following items, and the items shall be illustrated on a series of plan drawings numbered consecutively: 3A, 3B, 3C, etc. The scale on these drawings shall be one inch equals no greater than two hundred feet and contour intervals shall be no greater than five feet.

 - (a) The horizontal and vertical limits of excavation.

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- (b) The horizontal limits and final elevations of structural fill, added geologic material layer, vegetated earthen berm, and equivalent barrier to vegetated earthen berm.
- (c) An isopach showing the difference between the basal and final elevations of an added geologic material layer.
- (d) An isopach showing the difference between the final elevations of an added geologic material layer and top elevations of the uppermost aquifer system.
- (e) The basal elevations, final elevations, and anticipated horizontal limits of the recompacted soil liner.
- (f) The location and grade of temporary access roads on the internal slopes and on the facility bottom.
- (g) The final elevations of the leachate collection system drainage layer, the location of leachate collection system pipes with pipe inverts, the location of temperature monitoring structures, the locations for access for leachate sampling, and the layout of the leachate management system including apparatuses outside the disposal limits.
- (h) The location of sumps and for each sump above a flexible membrane liner the horizontal limits of the second flexible membrane liner.
- (i) The location of the gas management system components excluding the gas collection layer.
- (j) The location of leachate conveyance apparatuses that are part of the leachate recirculation system.
- (k) The anticipated location and anticipated final elevations of the separatory leachate barrier and collection system.
- (l) The horizontal limits and basal elevations of the disposal limits, including disposed material and areas of proposed material disposal.
- (m) The horizontal limits and final elevations of disposal limits, including disposed material and areas of proposed material disposal.
- (n) The location of fencing and gates.
- (o) The anticipated final elevations of existing and proposed cap system.
- (p) The location and grade of permanent and temporary access roads on the cap.

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- (q) The location and final elevations of surface water drainage and sediment controls and the final topography of areas of the facility that will be disturbed.
- (r) The location of ground water control structures.
- (s) The location of borings used for the site investigation.
- (t) The location of permanent survey marks.
- (4) Cross sections. Cross sections of the following shall be on plan drawings numbered consecutively 4A, 4B, 4C, etc. The drawings shall clearly show the horizontal and vertical scale used.

 - (a) The hydrogeology at the C&DD facility intercepted by borings or other subsurface investigation methods and showing the following:

 - (i) Existing topography.
 - (ii) The horizontal and vertical limits of excavation.
 - (iii) The horizontal limits and basal and final elevations of an added geologic material layer.
 - (iv) The horizontal limits and basal and final elevations of structural fill.
 - (v) The horizontal limits and final elevations of the liner system.
 - (vi) Geologic stratigraphy and significant zones of saturation corresponding to information from the subsurface investigation.
 - (vii) The uppermost aquifer system and saturated stratigraphic units above the uppermost aquifer system.
 - (viii) The subsurface investigation logs, including hydraulic conductivity measurements of the stratigraphic units, and monitoring well and piezometer construction diagrams, intercepted by the cross section.
 - (ix) Permanent ground water control structures.
 - (b) The length and width of the C&DD facility dividing the facility into quarters (i.e. three cross sections in each direction) showing the following:

[Comment: Additional cross sections may be submitted.]

 - (i) Existing topography.

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- (ii) The horizontal and vertical limits of excavation.
 - (iii) The horizontal limits and basal and final elevations of existing and proposed disposal limits.
 - (iv) The horizontal limits and basal and final elevations of the cap system.
 - (c) If the permit to install application is for a vertical expansion, the following at an interval no greater than every three hundred feet of length and width of the vertical expansion:
 - (i) Limits of existing disposed material with the date of the survey.
 - (ii) Previously authorized disposal limits and proposed disposal limits.
 - (iii) Limits of the separatory leachate barrier and collection system.
- (5) Detail drawings. The following details shall be on plan drawings numbered consecutively 5A, 5B, 5C, etc. and shall show the following items:
 - (a) The liner system.
 - (b) Each leachate management system element.
 - (c) Each leachate recirculation system element.
 - (d) The separatory leachate barrier and collection system.
 - (e) The cap system and details showing the interactions of the outlets from the drainage layer with roads and surface water drainage controls.
 - (f) The run-out and tie-in area for the added geologic material layer, the liner system, the leachate collection system drainage layer, the separatory leachate barrier and collection system, and the cap system.
 - (g) Interactions between surface water control structures and roads.
- (6) Design calculations. This section shall include the following design calculations with references to equations used, showing site specific input, assumptions, and results:
 - (a) The disposal volume of the C&DD facility in cubic yards.
 - (b) A geotechnical and stability analyses report prepared in the manner specified by Chapter 3745-511 of the Administrative Code. The following analyses,

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as required, shall be included in the geotechnical and stability analyses report:

(i) If the permit application is not solely for the purpose of expanding vertically over previously authorized disposal limits, the hydrostatic uplift analysis in the manner specified in rule 3745-511-20 of the Administrative Code.

(ii) If the permit application is not solely for the purpose of expanding vertically over previously authorized disposal limits, the seepage force analysis in the manner specified in rule 3745-511-25 of the Administrative Code.

(iii) If the design includes vertical sump risers located on the liner system, the bearing capacity analysis for the vertical sump risers in the manner specified in rule 3745-511-30 of the Administrative Code.

(iv) The static stability analysis for excavated slopes, internal slopes, and final slopes in the manner specified in rule 3745-511-40 of the Administrative Code.

(v) The seismic stability analysis for final slopes in the manner specified in rule 3745-511-50 of the Administrative Code.

(vi) The settlement analysis of the liner system and of the leachate management system in the manner specified in rule 3745-511-60 of the Administrative Code.

(vii) If the separatory leachate barrier and collection system is designed with a slope less than ten per cent, the settlement analysis of the separatory leachate barrier in the manner specified in rule 3745-511-65 of the Administrative Code.

(viii) Except for underground mines listed in paragraph (A) of rule 3745-510-335 of the Administrative Code, if any unstable areas were identified during the site investigation, the unstable area demonstration in the manner specified in rule 3745-511-70 of the Administrative Code.

(ix) If underground mines are present within one thousand feet of the disposal limits, the underground mine analysis in the manner specified in rule 3745-511-72 of the Administrative Code.

(c) Soil erosion.

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- (d) Leachate generation and level of leachate above the basal elevations of the leachate collection system drainage layer.
- (e) Filter layer design.
- (f) Infiltration rate of precipitation into the cap system drainage layer.
- (g) Landfill gas pressure, maximum expected gas flow rate, and flow capacity of the gas collection layer.
- (h) Condensate generation.
- (i) Ditch design.
- (j) Sediment and storm water control basin design.
- (k) Level and flow control structure design.
- (l) Boundaries of the one hundred year flood plain if no maps have been prepared boundaries under the National Flood Insurance Act of 1968. The boundaries of a one hundred year flood plain shall be determined by the applicant for a permit to install based upon standard methodologies set forth in "Urban Hydrology for Small Watersheds" and "National Engineering Handbook, part 630, Hydrology."
- (m) Other relevant calculations.
- (7) Construction specifications. This section shall include the following construction specifications when applicable:

 - (a) Alternatives to construction requirements in rules 3745-512-17 and 3745-512-611 of the Administrative Code.
 - (b) As a result of an exemption to a design requirement, construction specifications different than those required by rules 3745-520-500 to 3745-520-599 of the Administrative Code or Chapter 3745-512 of the Administrative Code.
 - (c) Geotechnical and stability limitations, including maximum slopes or minimum shear strengths, and criteria for removal of undesirable in situ material.
 - (d) Material specifications, pre-construction or construction testing, or construction activities necessary to confirm that the following engineered components are constructed to conform to the facility design plan:

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(i) Equivalent barriers to vegetated earthen berms.

(ii) Ground water control structures.

(iii) Gas collection and conveyance system components.