Ohio Administrative Code

Rule 3745-580-701 Application for a scrap tire monofill facility permit to install.

Effective: June 30, 2023

(A) Permit to install application.

(1) A permit to install application shall contain the information specified in paragraphs (B) to (D) of this rule, as applicable, including a certification statement and signature in accordance with rule 3745-500-50 of the Administrative Code, so that the director can determine if the criteria set forth in rules 3745-27-02 and 3745-580-703 of the Administrative Code are satisfied. If Ohio EPA determines that additional information is necessary to determine whether the criteria set forth in rules 3745-27-02 and 3745-580-703 of the Administrative Code are satisfied, the applicant shall supply such information as a precondition to further consideration of the permit to install application.

(a) A permit to install application for a new scrap tire monofill facility, to modify a scrap tire monofill for a lateral expansion, or a permit to install application that is submitted in response to division (B) of section 3734.77 of the Revised Code shall contain the information specified in paragraphs (B) and (C) of this rule with the exception of paragraph (B)(5)(c) of this rule.

(b) A permit to install application to modify a scrap tire monofill facility for a vertical expansion to the upper limits of scrap tire placement shall contain the following information:

(i) The plan sheets specified in paragraphs (B)(1), (B)(2), (B)(3)(f), (B)(4), (B)(5) and (B)(6) of this rule.

(ii) Detail drawings, as necessary, specified in paragraph (B)(7) of this rule.

(iii) The reports specified in paragraphs (C)(1), (C)(2) and (C)(6) of this rule.

(iv) The subsurface investigation report, as necessary to provide supporting information for the stability analysis, specified in paragraph (C)(3) of this rule.

(v) Stability analysis for bearing capacity, static stability, seismic stability, and settlement specified in paragraphs (C)(4)(b) to (C)(4)(e) of this rule.

(vi) Calculations, as necessary, specified in paragraph (C)(5) of this rule.

(vii) The quality assurance/quality control and the final closure/post-closure care plans specified in paragraph (C)(8) of this rule.

(viii) The letters and list of permits specified in paragraphs (C)(9)(a) and (C)(9)(b) of this rule.

(c) A permit to install application to modify a scrap tire monofill facility for a vertical expansion to the lower limits of waste placement shall contain the following information:

(i) The plan sheets specified in paragraphs (B)(1) to (B)(6) of this rule.

(ii) Detail drawings, as necessary, specified in paragraph (B)(7) of this rule.

(iii) The reports specified in paragraphs (C)(1) to (C)(3) and (C)(6) of this rule.

(iv) Stability analysis for hydrostatic uplift, bearing capacity, static stability, seismic stability, settlement, and piping failure specified in paragraphs (C)(4)(a) to (C)(4)(f) of this rule.

(v) Calculations, as necessary, specified in paragraph (C)(5) of this rule.

(vi) The quality assurance/quality control plan, as necessary, specified in paragraph (C)(8)(a) of this rule.

(vii) The letters and list of permits specified in paragraphs (C)(9)(a) and (C)(9)(b) of this rule.

(d) A permit to install application to modify a scrap tire monofill facility for a change to the information specified in paragraph (C)(7) of this rule shall discuss the change pursuant to paragraph (C)(7) of this rule in addition to the following:

(i) The summary specified in paragraph (C)(1) of this rule.

(ii) Any variance or exemption requests specified in paragraph (C)(2) of this rule.

(iii) If the change is to the authorized maximum daily waste receipt, the calculations showing gross volume and life specified in paragraph (C)(5)(a) of this rule.

(e) A permit to install application to modify a scrap tire monofill facility, other than what is listed in paragraphs (A)(1)(b) to (A)(1)(d) of this rule, shall contain the information specified by paragraphs (B) and (C) of this rule that are affected by the change and incorporate any alterations that were previously approved for those components affected by the change.

(f) A permit to install application for a scrap tire submergence facility shall contain the following information:

(i) The plan sheets specified in paragraphs (B)(1) to (B)(3) and (B)(6) of this rule.

(ii) Plan drawings specified in paragraphs (B)(4)(a), (B)(4)(b), and (B)(4)(f) of this rule.

(iii) Cross sections specified in paragraphs (B)(5)(a)(i), (B)(5)(a)(ii), and (B)(5)(b) of this rule.

(iv) Detail drawings specified in paragraphs (B)(7)(a) and (B)(7)(f) of this rule.

(v) The reports specified in paragraphs (C)(1) to (C)(4), (C)(6), (C)(8), and (C)(9) of this rule.

(vi) With the exception of paragraphs (C)(5)(d) and (C)(5)(k) of this rule, the calculations in paragraph (C)(5) of this rule.

(vii) Operational information specified in paragraphs (C)(7)(a) and (C)(7)(b) of this rule.

(2) A permit to install application shall contain detail engineering plans, specifications, and information that follows the format specified in paragraphs (B) and (C) of this rule with sufficient detail to allow clear understanding for technical review of the permit application and to provide

assurance that the facility is designed and will be operated in accordance with this chapter and Chapter 3745-501 of the Administrative Code.

(3) When publicly available information is specified in this rule, the applicant may use written or published information from public or private sources that is reasonably available to the public and includes but is not limited to visual surveys from public rights-of-way and public lands of the area surrounding the proposed scrap tire monofill facility or written or oral surveys of the landowners around the proposed scrap tire monofill facility.

[Comment: As long as the applicant can document that a reasonable attempt was made to obtain the information, the application will be considered complete even if information is lacking, such as a lack of response to the written or oral survey.]

(4) All engineering information included in the permit to install application shall be signed and sealed by a professional engineer.

(5) For regulatory review purposes, the applicant shall submit the initial application and any subsequent revisions in duplicate to Ohio EPA with a third copy sent to the licensing authority that includes an index listing the change and the page where the change occurred, as applicable. Upon written request from Ohio EPA, the applicant shall submit two additional and identically complete copies of the revised application to Ohio EPA.

(6) Concurrent to submitting the permit to install application, the applicant shall do the following:

(a) Submit a disclosure statement to the office of the attorney general as specified in rules 109:6-1-01 to 109:6-1-04 of the Administrative Code.

(b) Submit to the division of Ohio EPA regulating air pollution control and water pollution control written notification of intent to establish or modify a scrap tire monofill facility and a written request for information pertaining to any regulatory requirements under Chapter 3704. and 6111. of the Revised Code.

(7) The permit to install application, notwithstanding any deficiencies, may be considered and acted

upon if sufficient information is provided in the application for the director to determine whether the criteria set forth in rules 3745-27-02 and 3745-580-703 of the Administrative Code are satisfied.

(8) Upon issuance of the permit to install, Ohio EPA will send one copy of the permit to install and approved permit application to the licensing authority, will return one copy to the applicant, and will retain two copies in Ohio EPA's files.

(9) The permit to install remains in effect until the director has discontinued the post-closure care period of the scrap tire monofill facility unless the permit has been revoked or terminated in accordance with rules 3745-500-330 and 3745-500-350 of the Administrative Code.

(B) Plan sheets. The following detail engineering plans, specifications, and information for a scrap tire monofill facility shall be shown by means of drawings and narrative descriptions where appropriate, with minimum dimensions of twenty-four inches by thirty-six inches:

(1) The detail engineering plan cover sheet, to be numbered sheet 1, that contains the following information:

(a) The name of the scrap tire monofill facility.

(b) The precise geographic location and boundaries of the scrap tire monofill facility and the area within a five-mile radius shown on a road map with a scale of one inch equals no greater than one mile.

(c) The name, email address, and address of the permit to install applicant for the scrap tire monofill facility.

(d) The name, email address, and address of the owner and operator of the scrap tire monofill facility, if different from the applicant.

(e) The name, email address, and address of the person who prepared the plans.

(f) Index of plan sheets.

(2) Plan drawings showing items located within the facility boundary or within one thousand feet of the limits of waste placement or as otherwise specified in this paragraph, and any temporary scrap tire storage areas, on a series of plan sheets numbered consecutively 2A, 2B, 2C, etc. All items specified in an individual subheading shall be shown on the same plan drawing or include a note on the plan sheet stating the item does not exist within the specified distance of the limits of waste placement with a scale of one inch equals no greater than two hundred feet. An individual plan drawing may contain information specified in more than one individual subheading. The plan drawings shall contain at a minimum the following:

(a) Plan drawings that include the following:

(i) The property lines of land owned or leased for the scrap tire monofill facility as determined by a property survey conducted by a professional surveyor registered in Ohio.

(ii) The limits of waste placement and any temporary scrap tire storage area.

(iii) Existing topography showing streams, lakes, wetlands, springs, and other surface waters, with a contour interval no greater than five feet.

(iv) The north arrow.

(v) The location of survey marks.

(vi) The facility boundary.

(b) The following based on publicly available information:

(i) Zoning classifications, property owners, and political subdivisions.

(ii) The limits of any aquifers declared by the federal government under the "Safe Drinking Water Act", 88 Stat. 1660, 42 U.S.C. 300f, to be a sole source aquifer.

(iii) The limits of any regulatory floodplains.

(iv) A national park or recreation areas, candidate areas for potential inclusion into the national park system, and any state park or established state park purchase area.

(v) State nature preserves, state wildlife areas, national and state scenic rivers, any national wildlife refuge, special interest areas, research natural areas in the Wayne national forest, outstanding national resource waters, and exceptional coldwater habitats or exceptional warmwater habitats as defined in Chapter 3745-1 of the Administrative Code.

(vi) Public and private water supply wells within two thousand feet of the limits of waste placement. A scale insert may be used if necessary.

(vii) The limits of any drinking water source protection areas for public water systems using ground water that have been endorsed or delineated by Ohio EPA for a public water supply.

(viii) Surface and underground mining of coal and non-coal minerals and the angle of draw within two thousand feet of the limits of waste placement using a scale insert if necessary, and any oil and gas wells.

(ix) Domiciles within five hundred feet of the limits of waste placement or the temporary scrap tire storage area.

(x) Faults that have had displacement in Holocene time.

(c) The limits of disturbance and the facility boundary. The limits of disturbance include but are not limited to the limits of excavation, borrow areas, storage areas, staging areas, areas to be cleared and grubbed, and roadways.

(3) Plan drawings showing items located within three hundred feet of the limits of waste placement and any temporary scrap tire storage areas on a series of plan sheets numbered consecutively 3A, 3B, 3C, etc. Each plan drawing shall include the items specified in paragraph (B)(2)(a) of this rule and show all items specified in an individual subheading on the same plan drawing unless specified

otherwise with a scale of one inch equals no greater than two hundred feet. An individual plan drawing may contain information specified in more than one individual subheading. The plan drawings shall include at a minimum the following:

(a) The location of existing or proposed pipes and conduits, electric lines, french drains, roads, and railroads, and any easements bordering or within the proposed facility boundaries.

(b) The location of subsurface investigation sites, which are any location where subsurface conditions are investigated by data collection or evaluation, including but not limited to borings, test pits, monitoring wells, piezometers, tensiometers, geophysical survey stations and soil gas survey stations.

(c) Potentiometric maps of the uppermost aquifer system and significant zones of saturation above the uppermost aquifer system. More than one plan sheet may be used.

(d) The location of any permanent ground water control structures.

(e) A diagram showing the phases of the scrap tire facility.

(f) The land set aside for leachate treatment or pretreatment facilities if specified in paragraphs (J)(6) and (J)(7) of rule 3745-580-710 of the Administrative Code.

(g) The location of surface waters.

(4) Plan drawings for the entire scrap tire monofill facility on plan sheets numbered consecutively 4A, 4B, 4C, etc. with scale of one inch equals no greater than two hundred feet and contour intervals of no greater than five feet for slopes less than or equal to twenty-five per cent and ten feet for slopes greater than twenty-five per cent. The plan drawings shall show the boundaries and elevation and include the following:

(a) The horizontal and vertical limits of excavation proposed in the permit to install application, including any areas where added geologic material is necessary to comply with the isolation distance requirement in rule 3745-580-703 of the Administrative Code.

(b) The horizontal limits and top and bottom elevations of the recompacted soil liner proposed in the permit to install application.

(c) The top elevation of the leachate collection layer, pipe inverts, and layout of the leachate collection and management system, including any leachate storage structures and leachate lift stations proposed in the permit to install application.

(d) The horizontal limits and top and bottom elevations of existing waste and waste placement proposed in the permit to install application. Limits and elevations of existing waste may be determined by surveys.

(e) The horizontal limits and top and bottom elevations of the composite cap system, the surface water control structures including permanent ditches to control run-on and runoff and sedimentation ponds showing the inlet and outlet, and any permanent ground water control structures proposed in the permit to install application.

(f) An established grid system with northings and eastings not more than five hundred feet apart.

(5) Cross sections on plan sheets numbered consecutively 5A, 5B, 5C, etc. that clearly show the horizontal and vertical scale used and include the following:

(a) The hydrogeology of the scrap tire monofill facility intercepted by borings or other subsurface investigation methods that show the following:

(i) Existing topography.

(ii) The horizontal and vertical limits of excavation proposed in the permit to install application.

(iii) The horizontal limits and top and bottom elevations of any added geologic material.

(iv) The horizontal limits and bottom elevations of the recompacted soil liner.

(v) The horizontal limits, bottom elevations, and potential surface water inlet elevations of any subsurface leachate storage structures or leachate lift stations.

(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) Subsurface investigation logs, monitoring well construction diagrams, and piezometer construction diagrams intercepted by the cross-section.

(ix) Any permanent ground water control structures.

(b) The length and width of the scrap tire monofill facility dividing the scrap tire monofill facility into quarters (i.e. three cross-sections in each direction) showing the following:

(i) Existing topography.

(ii) The proposed horizontal and vertical limits of excavation.

(iii) The horizontal limits, top elevations, and bottom elevations of existing waste and proposed areas of waste placement and any temporary scrap tire storage area.

(iv) The horizontal limits, top elevations, and bottom elevations of the proposed composite 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:

[Comment: Additional cross-sections may be submitted.]

(i) Limits of existing waste with the date of the survey.

(ii) Approved and proposed limits of waste placement.

(6) Plan drawings showing the systematic development of each phase of the scrap tire monofill facility on plan sheets numbered consecutively 6A, 6B, 6C, etc. showing the phase, previously operated phases, the grid system established in accordance with paragraph (B)(4)(f) of this rule, and the following:

(a) The location of any leachate collection and management structures or surface water control structures to be installed prior to accepting waste in the depicted phase.

(b) The extent of waste placement for that phase.

(c) The contours of any previously filled phases.

(d) The limits of final cover, transitional cover, and intermediate cover on the previously filled phases.

(e) The contours of the bottom limits of waste placement for the depicted phase.

(f) The location of access roads for the depicted phase.

(g) The permanent and temporary measures to be utilized to control surface water run-on and runoff, and erosion.

(7) The following detail drawings on plan sheets numbered consecutively 7A, 7B, 7C, etc.:

(a) Recompacted soil liner, and any of the following if applicable, the flexible membrane liner, geosynthetic clay liner, liner cushion layer, leachate collection layer, and filter layer including any engineered components that are constructed through the composite liner system, and the interface between phases.

(b) Composite cap system, including any engineered components that are constructed through the

composite cap system, and surface water control structures.

(c) As applicable, the relationship of the composite cap system to the leachate collection and management system, and recompacted soil liner, flexible membrane liner, and geosynthetic clay liner.

(d) Leachate collection and management system elements including but not limited to the following:

(i) Leachate collection layer.

(ii) Collection pipes, including bedding media and boots.

(iii) Filter layer.

(iv) Sumps.

(v) Conveyance apparatus, including leachate lift stations.

(vi) Storage tanks.

(e) Permanent ground water control structures, if applicable.

(f) Sedimentation pond and discharge structures and surface water run-on and runoff control structures.

(g) Other necessary details including but not limited to structural fill for berms and subbase, and transitional cover.

(C) Reports. The following information shall be presented in narrative form in a report with a table of contents and divided and labeled according to paragraphs (C)(1) to (C)(9) of this rule:

(1) Summary. A summary of the facility environs and a demonstration that the scrap tire monofill facility will meet the criteria for permit approval specified in rules 3745-27-02 and 3745-580-703 of

the Administrative Code that includes a discussion of the current and previous owners', and current or previous operators' compliance with any authorizing document applicable to the facility, the facility's limits of waste placement and any temporary scrap tire storage areas, and operational criteria.

(2) Variance and exemption requests. Any variance or exemption requests from the requirements contained in rule 3745-27-15, 3745-27-16, 3745-580-703, 3745-580-705, 3745-580-710, 3745-580-725, 3745-580-726, or 3745-580-31 of the Administrative Code.

(3) Site investigation. A hydrogeologic and geotechnical site investigation report that includes at a minimum the following:

(a) Sufficient information to allow the director to determine the suitability of the site for scrap tire disposal through the following:

(i) Identification and characterization of the hydrogeology of the uppermost aquifer system and stratigraphic units that exist above the uppermost aquifer system.

(ii) Characterization of the site geology and hydrogeology to allow for the evaluation of the proposed design of the scrap tire monofill facility and to ensure that it will be in compliance with the requirements of paragraph (C)(4) of this rule.

[Comment: The narrative portion of the hydrogeologic and geotechnical report focuses on the siting and ground water monitoring issues. The subsurface investigation portion of the report also addresses stability and design issues.]

(b) A description, based on publicly available information, of the regional geology and hydrogeology within one mile of the proposed scrap tire monofill facility that a minimum includes the following:

[Comment: Publicly available information regarding unstable areas is placed in a separate section located in the stability analysis in paragraph (C)(4) of this rule.]

(i) The identification and average yield of the regional aquifer system.

(ii) The direction of ground water flow in the regional aquifer system.

(iii) The identification of recharge and discharge areas, within one mile of the limits of waste placement, of the regional aquifer system.

(iv) Regional stratigraphy, including any regional stratigraphic or structural features, such as the bedrock surface, bedrock dip, or joint systems, that may influence the ground water flow system.

(v) A description of the regional geomorphology, including the location of surface water bodies, flood plains, etc. and a description of any topographic features that may influence the ground water flow system.

(c) The following documents:

(i) If any surface or underground mines were identified in accordance with paragraph (B)(2)(b)(viii) of this rule, a letter from the Ohio department of natural resources division of mineral resource management or other appropriate agency verifying the type, mining method, location, depth, and status of the mine.

(ii) Documentation of who owns the mineral rights below the scrap tire monofill facility.

(iii) If any oil or gas wells were identified in accordance with paragraph (B)(2)(b)(viii) of this rule, a letter from the Ohio department of natural resources division of mineral resources management or other appropriate agency verifying the type, location, depth and status of the well.

(iv) A letter from the United States army corps of engineers agreeing with the wetland delineation, depicted on the plan drawing with the information pursuant to paragraph (B)(2)(a)(iii) of this rule, including confirmation of any isolated wetlands or if no wetlands are present.

(d) A detailed description and analysis of the geology and hydrogeology under the proposed scrap tire monofill facility based on data collected using appropriate subsurface investigatory methods such as borings, test pits, monitoring wells, piezometers, tensiometers, geophysical surveys, dutch

cone penetrometers, and soil gas surveys. At a minimum, the description and analysis shall include the following:

[Comment: This information may also be used in the stability analysis specified in paragraph (C)(4) of this rule.]

(i) The consolidated and unconsolidated stratigraphic units from the ground surface down to the base of the uppermost aquifer system including the following:

(A) The following characteristics, composition and features:

(i) For unconsolidated stratigraphic units, the textural classification in accordance with ASTM D2487.

(ii) For consolidated stratigraphic units, the rock type such as limestone, dolomite, coal, shale, siltstone, or sandstone.

(iii) Color.

(iv) Moisture content.

(v) Stratigraphic features such as layering, interbedding, or weathering.

(vi) Structural features such as fracturing or jointing.

(vii) Visible accessory minerals such as pyrite, calcite, or gypsum

(viii) Hydraulic conductivity.

(B) Thickness.

(C) Lateral extent.

(D) Depth and elevation.

(E) Variations in texture, saturation, stratigraphy, structure, or mineralogy exhibited by each stratigraphic unit that could influence the ground water flow or quality in the uppermost aquifer system or any overlying zones of saturation.

(ii) The local geomorphology at the proposed scrap tire monofill facility including surface water bodies or topographic features that could influence the ground water flow or quality in the uppermost aquifer system or any overlying zones of saturation.

(iii) Any local structural geology features under the proposed scrap tire monofill facility that could influence the ground water flow or quality in the uppermost aquifer system or any overlying zones of saturation.

(iv) The uppermost aquifer system and significant zones of saturation above the uppermost aquifer system including the depth to, and lateral and vertical extent of, the uppermost aquifer system and significant zones of saturation above the uppermost aquifer system that includes but is not limited to the following:

(A) Temporal fluctuations in ground water levels over a period of time to determine the seasonal effects on ground water flow directions.

(B) Using both narrative and map forms, an interpretation of the ground water flow system, including hydraulic conductivity, rate of flow, direction of flow, vertical and lateral components of flow, and interconnections between and within the uppermost aquifer system and any significant zones of saturation above the uppermost aquifer system.

(C) Identification and characterization of recharge and discharge areas within the boundaries of the proposed scrap tire monofill facility including any relationships of ground water with seeps, springs, streams, and other surface water features.

(D) Yield of any significant zones of saturation and of the uppermost aquifer system.

(v) If the applicant chooses, a site specific justification based on evidence gathered in accordance with paragraph (C)(3)(b) of this rule, that an unconsolidated aquifer system capable of sustaining a yield of one hundred gallons per minute for a twenty-four-hour period is not located beneath the facility.

(e) Subsurface investigation information used to prepare the site investigation report narrative in accordance with paragraphs (C)(3)(b) and (C)(3)(d) of this rule and the stability analyses in accordance with paragraph (C)(4) of this rule. The submitted information shall be adequate to satisfy the performance standards of paragraphs (C)(3)(a) and (C)(4) of this rule. At a minimum the information shall include the following:

[Comment: The narrative portion of the hydrogeologic and geotechnical report focuses on the siting and ground water monitoring issues. The subsurface investigation portion of the report also address stability and design issues.]

(i) Publicly available information collected and used to prepare the site investigation report narrative in accordance with paragraph (C)(3)(b) of this rule and the plan sheets specified in paragraph (B)(2) of this rule. At a minimum, publicly available information includes the following:

(A) Well logs and, where applicable, the decommissioning records for public and private water supply wells within one mile of the proposed scrap tire monofill facility.

(B) The Ohio department of natural resources county ground water resource maps or other appropriate regional hydrogeological data.

(C) Other publicly available information.

(ii) Information collected at the site for each stratigraphic unit from the surface to the bottom of the uppermost aquifer system or to one hundred and fifty feet below the proposed liner system, whichever is shallower. The information shall be used to prepare the site investigation report narrative as specified in paragraph (C)(3)(d) of this rule, be presented on logs appropriate for the subsurface investigatory method used, and at a minimum include the following:

[Comment: The subsurface investigation conducted to provide the information in accordance with this paragraph may be combined with the subsurface investigation conducted to provide the information specified in paragraph (C)(3)(e)(v) of this rule.]

(A) The northing and easting location coordinates of the subsurface investigation site.

(B) Surface elevation surveyed to the nearest tenth of a foot.

(C) Depth interval for each stratigraphic unit.

(D) Field descriptions of the consolidated and unconsolidated units including the following:

(i) Textural classification for each unconsolidated stratigraphic unit in accordance with ASTM D2487.

(ii) Color.

(iii) Moisture content.

(iv) Stratigraphic features such as layering, interbedding, or weathering.

(v) Structural features such as fracturing or jointing.

(vi) Visible accessory minerals such as pyrite, calcite or gypsum.

(vii) Rock type such as limestone, dolomite, coal, shale, siltstone or sandstone.

(viii) Thickness.

(ix) Variations in texture, saturation, stratigraphy, structure or mineralogy in each stratigraphic unit.

(E) Depth to saturation.

(F) Hydraulic conductivity, including the following:

(i) For saturated unconsolidated stratigraphic units, at least one field measurement of hydraulic conductivity per saturated unconsolidated unit and one additional measurement per saturated unconsolidated unit for each twenty acres.

(ii) For unconsolidated stratigraphic units, from which an undisturbed sample can be collected, at least one laboratory measurement of vertical hydraulic conductivity per unconsolidated unit and one additional measurement per unconsolidated unit for each twenty acres.

(iii) For saturated consolidated stratigraphic units, at least one field measurement of hydraulic conductivity per saturated consolidated unit and one additional measurement per saturated consolidated unit for each twenty acres.

[Comment: Most field methods for measuring hydraulic conductivity primarily evaluate lateral hydraulic conductivity, but also account for at least some effects of vertical hydraulic conductivity over the tested interval. In cases where laboratory measurements of vertical hydraulic conductivity are obtained for unconsolidated saturated units which are wholly or partially saturated, the vertical hydraulic conductivity should be compared to the field hydraulic conductivity to help evaluate the extent to which near-vertical fractures may be contributing to ground water flow through the unit. Hydraulic conductivity data should be interpreted with respect to the primary and secondary porosity features that are observed or are reasonably expected to occur in the investigated units, as well as the stratigraphic and structural features of the investigated units.]

(G) Yield of any significant zones of saturation and of the uppermost aquifer.

(H) If an unconsolidated aquifer system capable of sustaining a yield of one hundred gallons per minute for a twenty-four-hour period is suspected beneath the facility based on evidence gathered in accordance with paragraph (C)(3)(b) of this rule, and the applicant proposes to revise that finding, adequate site-specific information on the suspected aquifer system to justify any requested revision including but not limited to the yield of any aquifer systems below the uppermost aquifer system.

(iii) A construction diagram of each monitoring well and piezometer that at a minimum includes the

following:

(A) The top-of-casing elevation used for water level measurement reference surveyed to the nearest hundredth of a foot.

(B) The boring diameter and the inside diameter of the well casing.

(C) The total depth of the boring and the total depth of the well.

(D) The screened interval depth and elevation, and the screen slot size.

(E) A description of construction materials and depth intervals for construction materials.

(iv) Information collected at the site and used to prepare the stability analysis specified in paragraph (C)(4) of this rule presented on logs appropriate for the subsurface investigatory method used. The subsurface investigatory method and frequency shall be adequate to find the unconsolidated stratigraphic units susceptible to bearing capacity failure, static stability failure, seismic stability failure, or settlement at the site. The information shall be collected for each unconsolidated stratigraphic unit under the facility down to fifty feet below the proposed depths of excavation and at a minimum include the following:

[Comment: Ohio EPA recommends a frequency of one subsurface investigatory site for every four acres on a more or less uniform grid across the site. However, for sites that are located in areas where landslides or mass movements of unconsolidated material have occurred, or are underlain by complex geology with multiple unconsolidated stratigraphic units, more borings may be necessary pursuant to paragraph (A)(1) of this rule. Sites that are located in areas with a consistent stratigraphy, which is supported by comprehensive and reliable information from previous studies, may use a lower frequency of borings. Ohio EPA recommends against boring through cap, existing waste, or liner to obtain this information. Other methods or increased borings around the landfill footprint should be used.]

[Comment: Given the objective of finding thin unconsolidated stratigraphic units susceptible to bearing capacity failure, static stability failure, seismic stability failure, or settlement, the

unconsolidated stratigraphic units should be logged continuously, and the subsurface investigation may also need to go deeper if publicly available data gathered pursuant to paragraph (C)(4)(g) of this rule or if field data gathered pursuant to paragraph (C)(3)(d)(i) of this rule indicate that deeper susceptible units exist.]

[Comment: The subsurface investigation conducted to provide the information specified in this paragraph may be combined with the subsurface investigation conducted to provide the information specified in paragraph (C)(3)(e)(ii) of this rule.]

(A) Northing and easting location coordinates.

(B) Surface elevation surveyed to the nearest tenth of a foot.

(C) Depth interval for each stratigraphic unit.

(D) Field descriptions of the unconsolidated units that at a minimum include the following:

(i) Textural classification for each unconsolidated stratigraphic unit in accordance with ASTM D2487.

(ii) Color.

(iii) Moisture content.

(iv) Stratigraphic features such as layering, interbedding, or weathering.

(v) For fine-grained unconsolidated units, field descriptions of consistency and plasticity or dilatancy.

(vi) Thickness.

(vii) Variations in texture, saturation, stratigraphy, structure or mineralogy in each stratigraphic unit.

(E) Identification of the depth interval of any samples collected including those submitted for laboratory testing.

(F) Depth to phreatic and piezometric surfaces.

[Comment: "Phreatic surface" is synonymous with the term "water table" and "piezometric surface" is synonymous with the term "potentiometric surface." Hydrogeologic investigations generally use "water table" for a water level surface in an unconfined saturated unit and "potentiometric surface" for the pressure head surface associated with a confined saturated unit. In hydrogeologic applications, the "water table" is considered a special type of potentiometric surface where the head pressure is equal to atmospheric pressure.]

[Comment: Any piezometric surfaces associated with bedrock that may affect the facility during excavation or construction may also be identified.]

(G) Results from penetration testing in accordance with ASTM D1586, plus the corrected and normalized standard penetration number or results from mechanical cone penetration testing in accordance with ASTM D3441.

(v) Laboratory analysis on representative samples of each unconsolidated stratigraphic unit under the facility down to a minimum of fifty feet below the proposed depths of excavation. The information shall be used to prepare the stability analysis specified in paragraph (C)(4) of this rule and at a minimum include the following:

[Comment: Undisturbed samples from at least ten per cent of the borings passing through each susceptible unit or a minimum of three, whichever is greater, should be collected to provide representative data.]

(A) Grain size distribution.

(B) Atterberg limits.

(C) Specific gravity.

(D) In situ unit weight.

(E) In situ moisture content.

(F) Dry unit weight.

(G) For unconsolidated stratigraphic units susceptible to bearing capacity failure, the effective drained or undrained peak shear strength parameters as appropriate in accordance with ASTM D2850 or ASTM D6467.

(H) For unconsolidated stratigraphic units susceptible to static stability failure or seismic stability failure, the effective shear strength in accordance with ASTM D4767 or ASTM D6467.

(I) For unconsolidated stratigraphic units susceptible to static stability failure or seismic stability failure due to excessive increase in pore pressures from construction and operation activities, the undrained shear strength using fully saturated samples determined in accordance with ASTM D2850.

(J) For unconsolidated stratigraphic units susceptible to settlement, the following parameters:

(i) The coefficient of consolidation.

(ii) The over consolidation ratio.

(iii) The pre-consolidation pressure.

(iv) The compression index.

(v) The swelling index.

(vi) The in situ void ratio.

(vii) The effective porosity.

(viii) Representative samples of each unconsolidated stratigraphic unit susceptible to seepage piping failure tested in accordance with ASTM D4647. Units susceptible to seepage piping failure include those located within fifteen feet of the proposed depths of excavation and those located where the piezometric surface of an aquifer or a zone of significant saturation is higher than the depth of excavation.

(ix) Any other data generated.

(f) A detailed description of how the subsurface investigation was conducted including the following:

(i) The subsurface investigatory and sampling methods used in characterizing the geologic properties of the proposed scrap tire monofill facility and an explanation of why the particular subsurface investigatory method was chosen.

(ii) The analytical procedures and methodology used to characterize the consolidated and unconsolidated materials obtained from test pits and borings.

(iii) The methodology, equipment, and procedures used to define the uppermost aquifer system and significant zones of saturation above the uppermost aquifer system, including the following:

(A) Well and piezometer construction specifications.

(B) Water level measurement.

(iv) The methodology, equipment, and procedures used to determine the ground water quality in the uppermost aquifer system and any significant zones of saturation above the uppermost aquifer system, including the following:

(A) Detection of immiscible layers.

(B) Collection of ground water samples, including the following:

(i) Well evacuation.

(ii) Sample withdrawal.

(iii) Sample containers and handling.

(iv) Sample preservation.

(C) Performance of field analysis, including the following:

(i) Procedures and forms for recording data and the exact location, time, and facility-specific considerations associated with the data acquisition.

(ii) Calibration of field devices.

(D) Decontamination of equipment.

(E) Analysis of ground water samples.

(F) Chain of custody control, including the following:

(i) Standardized field tracking reporting forms to record sample custody in the field prior to and during shipment and receipt at the lab.

(ii) Sample labels indicating a unique sample number, date, time, sample type, analytical methods, and any other information necessary for effective sample tracking.

(G) Field and laboratory quality assurance and quality control including the following, the number of which are sufficient to adequately demonstrate the accuracy of the analysis results:

(i) Collection of duplicate samples.

(ii) Submission of field-bias blanks.

(iii) Potential interferences.

(4) Stability analysis. The following analyses establishing the stability of the scrap tire monofill facility and the subsurface with sufficient information to allow Ohio EPA to characterize the facility geology to allow for the evaluation of the proposed design of the scrap tire monofill facility:

(a) The hydrostatic uplift analysis that includes the following:

(i) The scope, extent, and findings of the subsurface investigation conducted in accordance with paragraph (C)(3) of this rule, as it pertains to hydrostatic uplift.

(ii) A narrative description of the rationale used for the selection of the analysis input parameters.

(iii) A description of the method used to calculate hydraulic uplift.

(iv) A description of the assessed failure modes and conditions.

(v) A narrative description of the rationale used for the selection of the critical cross section that at a minimum considers the worst case intersection of the highest phreatic or piezometric surface with the maximum excavation depth.

(vi) A plan drawing showing the greatest temporal high phreatic or piezometric surface derived in accordance with paragraph (B)(3)(c) of this rule and the horizontal and vertical limits of excavation derived in accordance with paragraph (B)(4)(a) of this rule.

(vii) A profile view of the critical area that fully depicts the analysis input model including the following:

(A) The material boundaries.

(B) The applicable dimensions including but not limited to the depth of excavation, and depth to the

temporal high phreatic and piezometric surfaces.

(C) The material types.

(D) The in situ weights and saturated unit weights.

(viii) The actual calculations or computer output.

(b) The bearing capacity analysis for any vertical sump risers on the composite liner system that includes the following:

(i) The scope, extent, and findings of the subsurface investigation conducted in accordance with paragraph (C)(3) of this rule, as it pertains to bearing capacity.

(ii) A narrative description of the rationale used for the selection of the analysis input parameters.

(iii) A description of the method used to calculate bearing capacity.

(iv) A description of the assessed failure modes and conditions.

(v) A profile view of the critical cross section that fully depicts the analysis input model including the following:

(A) The material boundaries.

(B) The temporal high piezometric surface.

(C) The material types.

(D) The in situ unit weights and saturated unit weights.

(vi) The plan view of the critical cross section including northings and eastings for the endpoints of the section.

(vii) The actual calculations or computer output.

(c) The static stability analysis that includes the following:

(i) The scope, extent, and findings of the subsurface investigation conducted in accordance with paragraph (C)(3) of this rule, and earthen materials testing program as it pertains to static stability.

(ii) A narrative description of the rationale used for the selection of the analysis input parameters.

(iii) A description of the method used to calculate static stability.

(iv) An assessment of failure modes and conditions that at a minimum include the following:

(A) Deep-seated translational and rotational failure mechanisms of internal slopes, interim slopes and final slopes for drained conditions and, as applicable, undrained conditions.

(B) Shallow transitional and rotational failure mechanisms of internal slopes and final slopes for saturated conditions and drained conditions.

(v) For each of the failure modes and conditions assessed, a narrative description of the rationale used for the selection of the critical cross sections for the internal slopes, interim slopes, and final slopes.

(vi) A profile view of the critical cross sections that fully depicts the analysis input model including the following:

(A) The material boundaries.

(B) The temporal high phreatic and piezometric surfaces.

(C) The material types.

(D) The in situ unit weights and, where applicable, the in situ saturated unit weights.

(E) The material shear strengths.

(vii) The plan view of the critical cross sections that includes the northings and eastings for the endpoints of the sections.

(viii) A summary of the results using two dimensional limit equilibrium methods or other methods acceptable to Ohio EPA for each of the critical cross sections.

(ix) The actual calculations or computer output.

(d) The seismic stability analysis that includes the following:

(i) The scope, extent, and findings of the subsurface investigation conducted in accordance with paragraph (C)(3) of this rule, and earthen materials testing program as it pertains to seismic stability.

(ii) A narrative description of the rational used for the selection of the analysis input parameters.

(iii) A description of the method used to calculate the seismic stability.

(iv) An assessment of failure modes and conditions that at a minimum include the following:

(A) Deep-seated translational and rotational failure mechanisms of final slopes for drained conditions.

(B) Deep-seated translational and rotational failure mechanisms of internal and interim slopes for drained conditions, if specified by Ohio EPA.

(C) Shallow translational and rotational failure mechanisms of final slopes for drained conditions.

(D) Liquefaction failure mechanisms of internal slopes, interim slopes, and final slopes.

(v) For each of the failure modes and conditions assessed, a narrative description of the rationale used for the selection of the critical cross sections for the internal slopes, interim slopes, and final slopes.

(vi) The profile views of the critical cross sections that fully depict the analysis input model including the following:

(A) The material boundaries.

(B) The temporal high phreatic and piezometric surfaces.

(C) The material types.

(D) The in situ unit weights and, where applicable, the in situ saturated unit weights.

(E) The material shear strengths.

(vii) The plan views of the critical cross sections that include the northings and eastings for the endpoints of the sections.

(viii) A summary of the results using two or three dimensional limit equilibrium methods or other methods acceptable to Ohio EPA for each of the critical cross sections.

(ix) The actual calculations or computer output.

(e) The settlement analyses of the liner system that includes the following:

(i) The scope, extent, and findings of the subsurface investigation conducted in accordance with paragraph (C)(3) of this rule, and earthen materials testing program as it pertains to settlement.

(ii) A narrative description of the rationale used for the selection of the analysis input parameters.

(iii) A description of the method used to calculate the settlement.

(iv) A description of the assessed failure modes and conditions.

(v) A summary of the results.

(vi) The actual calculations of settlement or computer output.

(f) The piping failure through in situ foundation, added geologic material, and recompacted soil liner analysis that includes the following:

(i) The scope, extent, and findings of the subsurface investigation conducted in accordance with paragraph (C)(3) of this rule, as it pertains to piping failure through in situ foundation.

(ii) A narrative description of the rationale used for the selection of the analysis input parameters.

(iii) A description of the method used to calculate likelihood of piping failure through in situ foundation or added geologic material or recompacted soil liner.

(iv) A description of the assessed failure modes and conditions.

(v) A narrative description of the rationale used for the selection of the critical cross section that at a minimum considers the worst-case intersection of the highest phreatic or piezometric surface with the maximum excavation depth.

(vi) A plan drawing showing the temporal high phreatic and piezometric surfaces derived in accordance with paragraph (B)(3)(d) of this rule and the horizontal and vertical limits of excavation derived in accordance with paragraph (B)(4)(a) of this rule.

(vii) A profile view of the critical area that fully depicts the analysis input model including the following:

(A) The material boundaries.

(B) The applicable dimensions, including but not limited to the depth of excavation, and depth to the temporal high phreatic and piezometric surfaces.

(C) The material types.

(D) The in situ unit weights and saturated unit weights.

(viii) The actual calculations or computer output.

(g) A description, based on publicly available information, of any of the following unstable areas within one mile of the limits of waste placement. If the scrap tire monofill facility is located in an unstable area, the applicant shall provide an analysis that the structural components will maintain their integrity based on publicly available information and findings of the subsurface investigation conducted in accordance with paragraph (C)(3) of this rule.

(i) Regional stratigraphic or structural features that are susceptible to bearing capacity failure, static stability failure, seismic stability failure, or settlement.

(ii) Areas susceptible to liquefaction.

(iii) Areas susceptible to mass movement such as landslides, debris slides and falls, and rock falls.

(iv) Areas impacted by natural and human induced activities such as cutting and filling, draw down of ground water, rapid weathering, heavy rain, seismic activity and blasting.

(v) Presence of karst terrain.

(vi) Presence of underground mining.

(vii) Areas susceptible to coastal and river erosion.

(5) Calculations. The following design calculations with references to equations used, showing site specific input and assumptions that demonstrate compliance with the design requirements of rule

3745-580-705 of the Administrative Code:

(a) Calculations showing gross volume of the scrap tire monofill facility in cubic yards and the anticipated life in years, and the gross volume in cubic yards and the anticipated life of each phase of the scrap tire monofill facility.

(b) Recompacted soil liner thickness, as specified in rule 3745-580-705 of the Administrative Code.

(c) Calculations for the leachate head and flow.

(d) Calculations for sizing any leachate storage tanks based on the volume of leachate generated after final closure.

(e) Pump size and pipe size calculations based on paragraph (C)(5)(c) of this rule.

(f) Pipe strength and pipe deflection calculations for the leachate collection and management system.

(g) An itemized written closure cost estimate, in current dollars, based on the following:

(i) The cost of final closure of a scrap tire monofill facility in accordance with rule 3745-580-725 of the Administrative Code.

(ii) A third-party conducting the final closure activities, assuming payment to its employees of not less than the applicable prevailing wage.

(h) An itemized written post-closure care cost estimate, in current dollars, based on the following:

(i) The cost of post-closure care of the phases of the scrap tire monofill facility in accordance with rule 3745-580-726 of the Administrative Code.

(ii) A third-party conducting the post-closure care activities, assuming payment to its employees of not less than the applicable prevailing wage.

(i) Soil erosion calculations.

(j) Calculations for sizing and surfacing water control structures and verifying that scouring and crushing is minimized.

(k) Calculations for sizing the sedimentation basin.

(l) Other relevant calculations.

(6) Construction information. Demonstration of physical resistance as specified in paragraphs (B) and (C) of rule 3745-580-705 of the Administrative Code and compaction equipment slope limitations.

(7) Operational information. The following information, which if modified, may constitute the need for a permit:

(a) Authorized maximum daily waste receipt requested for the scrap tire monofill facility.

(b) Technique of waste receipt including but not limited to accepting baled scrap tires, loose scrap tires, or using tipper.

(c) Type of equipment to be used to construct, operate, and maintain the scrap tire monofill facility.

[Comment: A change in equipment that decreases the capability of the owner or operator to handle the waste received, may be considered to endanger human health and may constitute the need for a permit.]

(8) Plans. The following plans:

(a) The quality assurance/quality control plan for the engineered components addressing the following:

(i) Surveying.

(ii) Calibration of testing equipment.

(iii) Sampling and testing procedures to be used in the field and in the laboratory, including but not limited to the following:

(A) Testing specified in rule 3745-580-710 of the Administrative Code.

(B) Testing necessary due to design requirements.

(C) Voluntary testing.

(iv) Procedures to be followed if a test fails.

(b) The final closure/post-closure plan as detailed in paragraph (B) of rule 3745-580-725 of the Administrative Code.

(9) Notifications and certifications. The following notifications and certifications:

(a) Copies of the letters of intent to establish or modify a scrap tire monofill facility, which include a description of property and facility boundaries, sent via certified mail or any other form of mail accompanied by a receipt to the following entities:

(i) The governments of the political subdivisions where the facility is located including but not limited to county commissioners, the legislative authority of a municipal corporation, or the board of township trustees.

(ii) The single county or joint county solid waste management district or regional solid waste management authority where the facility is located or that is served by the facility.

(iii) The owner or lessee of any easement or right-of-way bordering or within the proposed facility boundaries that may be affected by the proposed scrap tire monofill facility.

(iv) The local zoning authority having jurisdiction.

(v) The park system administrator, if any part of the scrap tire monofill facility is located within or shares the park boundary.

(vi) The conservancy district, if any part of the scrap tire monofill facility is located within or shares the conservancy district boundary.

(b) A list of the permits, licenses, plan approvals, authorizations or other approvals that have been applied for and the local, state or federal office or agency where application has been made.

(c) Proof of property ownership or lease agreement to use the property as a scrap tire monofill facility.

(D) Closure and post closure care cost estimates and financial assurance. In addition to the calculations specified in paragraphs (C)(5)(g) and (C)(5)(h) of this rule, the owner or operator shall submit the following information as part of the permit to install application:

(1) Closure cost estimates and post-closure care cost estimates in accordance with rule 3745-580-22 of the Administrative Code.

(2) A draft financial assurance instrument for closure in accordance with rule 3745-503-05 of the Administrative Code.

(3) A draft financial assurance instrument for post-closure care in accordance with rule 3745-503-10 of the Administrative Code.