



## Ohio Administrative Code Rule 901:10-2-03 Geological explorations.

Effective: January 1, 2025

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(A) Fabricated structures - A subsurface geological exploration shall be completed for fabricated structures as described in this paragraph:

(1) For fabricated structures storing solid manure.

Evaluate the suitability of the soil to provide the appropriate load bearing strength for the proposed fabricated structure by use of a soil survey or by a geological exploration conducted in accordance with this rule. The director may require on-site subsurface geological explorations depending on the soil survey, depth of the structure to be installed below existing grade, height of the proposed walls and type of structural loading of the fabricated structure. The geological report shall meet the requirements in paragraph (C) of this rule.

(2) For fabricated structures storing liquid manure.

The subsurface geological exploration and report, described in paragraph (C) of this rule, shall be completed under the supervision of a professional geologist or a professional engineer and be in compliance with and describe the following:

(a) The subsurface geological exploration shall include a minimum of three test pits or borings. The test pits or borings must be at regular intervals and within a reasonable distance of the boundaries of the proposed fabricated structure. Additional test pits or borings may be required by the director, the professional engineer, or the professional geologist.

(b) The test pits or borings shall extend a minimum of five feet below the lowest elevation of manure placement within the fabricated structure. In addition, a representative number of test pits or borings shall extend deep enough to determine if the fabricated structure meets the siting criteria from the uppermost aquifer described in rule 901:10-2-02 of the Administrative Code. Upon completion, any boring or pit used for sampling shall be properly plugged and sealed.



(c) The classification of the soil material using the unified soil classification system shall be provided, as set forth in:

(i) "ASTM D2487" (2017); or

(ii) "ASTM D2488" (2017).

(d) The in-situ hydraulic conductivity of the soil material shall be determined, based on lab results, within five feet below the lowest elevation of manure placement within the fabricated structure.

(e) The subsurface geological exploration shall evaluate the suitability of the soil to provide the appropriate load bearing strength for the proposed fabricated structure as set forth in the appendix to rule 901:10-2-05 of the Administrative Code.

(f) The subsurface geological exploration shall determine soil strength values unless the lateral earth pressures set forth in the appendix to rule 901:10-2-05 of the Administrative Code are used to design the fabricated structure.

(g) The subsurface geological exploration shall evaluate whether the proposed fabricated structure is to be located within a karst area; and

(h) Ground water quality characteristics.

(i) Ground water shall be sampled from a well existing at the facility.

(ii) If no well exists at the facility, ground water may be sampled from a well that is nearby as approved by the department. If no nearby existing well is available for sampling prior to construction of a new facility, then the director may allow sampling prior to approval of stocking as described in paragraph (B)(4) of rule 901:10-2-01 of the Administrative Code.

(iii) A well installed or otherwise approved for use to satisfy the requirements of this rule, may also be used to satisfy the annual ground water sampling and analysis required by rule 901:10-2-08 of the



Administrative Code.

(i) In the event that the director determines that ground water monitoring will be required to satisfy the requirements of this rule or rule 901:10-2-02 of the Administrative Code, then a ground water monitoring program shall be designed, installed, and implemented as approved by the director in a permit to install and permit to operate.

(B) Manure Storage Ponds or Manure Treatment Lagoons - A subsurface geological exploration shall be completed for manure storage ponds or manure treatment lagoons as described in this paragraph.

The subsurface geological exploration and report shall be completed under the supervision of a professional geologist or a professional engineer, and be in compliance with and describe the following:

(1) The subsurface geological exploration shall include a minimum of four test pits or borings. The test pits or borings must be at regular intervals and within a reasonable distance of the boundaries of the proposed manure storage pond or manure treatment lagoon. Additional test pits or borings may be required by the director, the professional engineer, or the professional geologist.

(2) The test pits or borings shall extend a minimum of five feet below the lowest elevation of manure placement within the manure storage pond or manure treatment lagoon. In addition, a representative number of test pits or borings shall extend deep enough to determine if the manure storage pond or manure treatment lagoon meets the siting criteria from the uppermost aquifer described in rule 901:10-2-02 of the Administrative Code. Upon completion, any boring or pit used for sampling shall be properly plugged and sealed. Any pit used for sampling that is within the construction boundaries of the concentrated animal feeding facility, the manure storage pond or the manure treatment lagoon shall be restored by the addition of cohesive soil compacted in lifts no greater than six inches;

(3) The classification of the soil material using the unified soil classification system shall be provided as set forth in:

(a) "ASTM D2487" (2017); or



(b) "ASTM D2488" (2017).

(4) The in-situ hydraulic conductivity of the soil material shall be determined, based on lab results, within five feet below the lowest elevation of manure placement within the manure storage pond or manure treatment lagoon;

(5) The subsurface geological exploration shall evaluate the suitability of the soil material to provide adequate sealing of the bottom of the manure storage pond or manure treatment lagoon and construction of the planned embankments as described in rule 901:10-2-06 of the Administrative Code;

(6) The subsurface geological exploration shall evaluate whether the proposed manure storage pond or manure treatment lagoon is to be located within a karst area;

(7) Ground water quality characteristics.

(a) Ground water shall be sampled from a well existing at the facility.

(b) If no well exists at the facility, ground water may be sampled from a well that is nearby as approved by the department. If no nearby existing well is available for sampling prior to construction of a new facility, then the director may allow sampling prior to approval of stocking as described in paragraph (B)(4) of rule 901:10-2-01 of the Administrative Code.

(c) A well installed or otherwise approved for use to satisfy the requirements of this rule, may also be used to satisfy the annual ground water sampling and analysis required by rule 901:10-2-08 of the Administrative Code.

(8) In the event that the director determines that ground water monitoring will be required to satisfy the requirements of this rule or rule 901:10-2-02 of the Administrative Code, then a ground water monitoring program shall be designed, installed, and implemented as approved by the director in a permit to install and permit to operate.



(9) Based on the results of the subsurface geological exploration and determinations by the professional geologist, professional engineer, or the director, additional tests may be required to determine the potential need for a liner and the liner specifications;

(10) The department may require additional subsurface geological explorations depending on the soils and geological formations on site to ensure the protection of the ground water, surface water or the structural integrity of the manure storage pond or manure treatment lagoon. The subsurface geological exploration shall refer to the Ohio department of natural resources groundwater vulnerability map of Ohio to determine the pollution potential for each site, the pathways of contamination, if any, and whether additional design is needed to protect water and ground water.

(C) The results of subsurface geological explorations performed in accordance with paragraphs (A) and (B) of this rule shall be included in a report and submitted with the facility design plans.

(1) The report shall include but not be limited to an analysis or evaluation that demonstrates the information provided meets the requirements of rules 901:10-2-01 to 901:10-2-06 of the Administrative Code, and as follows for each applicable type of manure storage and treatment facility:

(a) For any planned manure storage or treatment facility, the analysis or evaluation shall provide the following information:

(i) A plan and profile view of the facility's wells and any exploration pits and borings shown in relation to the manure storage or treatment facility;

(ii) Available Ohio department of natural resources water well logs of wells located within a minimum of two thousand feet of the planned manure storage or treatment facility;

(iii) Subsurface materials identified using the unified soil classification system as set forth in:

(A) "ASTM D2487"(2017); or

(B) "ASTM D2488"(2017).



(iv) Identification of the uppermost aquifer at the site and the criteria used to make this determination.

(b) For any planned liquid manure fabricated structure, manure storage pond, or manure treatment lagoon, the analysis or evaluation shall also provide the following additional information:

(i) Evidence of seepage or ground water conditions and depths in pits or borings;

(ii) Determination of the suitability of in-situ soils to provide an acceptable liner system, or lining recommendations when the in-situ soils are not suitable, which shall include remold permeability tests of planned liner material;

(iii) The results of the laboratory analyses soil samples.

(c) For any planned manure storage pond or manure treatment lagoon, the analysis or evaluation shall also provide the following additional information:

(i) Recommendation from the laboratory analysis of the compactive effort or soil density; and

(ii) Soil moisture requirements needed during construction to achieve design hydraulic conductivity.

(2) Based on the results of the tests completed to satisfy this rule, the professional engineer, professional geologist, or director may require additional explorations that may include laboratory testing of soils and additional ground water monitoring wells.

(D) Laboratory testing and analysis:

(1) Soil samples taken during the subsurface geological exploration shall be tested in accordance with approved or certified soil testing procedures.

(2) Tests and results reported shall include, but not be limited to, in-situ hydraulic conductivity, dry unit weight, Atterberg limits, soil particle size analysis and compactive effort to achieve design



remold hydraulic conductivity.

(E) Upon request by the owner or operator and subsequent written approval from the department, field changes may be made in order to meet site-specific conditions during construction. The owner or operator shall demonstrate that such changes will be at least as protective of the ground water, surface water, and the structural integrity of the manure storage or treatment facility as requirements of this chapter.