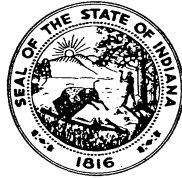


Frank L. O'Bannon
Governor

Gregory A. Wilson, M.D.
State Health Commissioner



Indiana State Department of Health

An Equal Opportunity Employer

DATE: July 18, 2001

TO: Adams, Allen, Blackford, DeKalb, Delaware, Grant, Howard, Huntington, Jay, Miami, Noble, Randolph, Steuben, Wabash, Wells, and Whitley Counties

FROM: Howard W. Cundiff, P.E., Director *HWC*
Consumer Protection
AC (317) 233-7182

SUBJECT: Residential and Commercial On-site Sewage Systems and
Recessional Moraines in Northeastern Indiana
Update to Memorandum of June 19, 2001

The Recessional Moraines in Northeastern Indiana include parts of: Adams, Allen, Blackford, DeKalb, Delaware, Grant, Howard, Huntington, Jay, Miami, Noble, Randolph, Steuben, Wabash, Wells, and Whitley Counties.

Questions and issues have come up which require this memorandum to update my memorandum of June 19, 2001, and to clarify the procedures pertinent to the evaluation of recessional moraine soils for on-site sewage systems. This memorandum provides:

- ◆ The implementation of a new procedural flow chart. This revision is due to a question of application of the procedure outside of the moraine soils and the 1 1/2 mile buffer zone. The procedure is to be applied to the soil map units when the site is outside of the recessional moraine and the 1 1/2 mile buffer zone. A new flow chart is attached to reflect that requirement. Please replace the previous flow chart with this one.
- ◆ The addition of two NRCS soil series to the list of nine in the memorandum of June 19, 2001. The complete list of eleven NRCS soil series is below.
- ◆ That the flow chart must be followed, including all of the steps. To conduct the evaluation of the site in any procedure other than what is prescribed will not provide the health department with all of the information necessary to process an application for a permit.
- ◆ Clarification as to the use of the Modified Permeability Test. This test is to be used, when required, as a part of the procedure for the evaluation of recessional moraine soils for on-site sewage systems. It has no other application. The procedure itself has not changed from my memorandum of June 19, 2001, but the introduction has been modified to provide a clearer explanation as to the limits of its use. The new document for the Modified Permeability Test is attached. Please replace the previous document with this one.
- ◆ Clarification on procedures when the soils description differs from the modal description of the soil series mapped at the site. If the soil is mapped as one of the eleven NRCS soil series, the procedure must be followed, even if the soil scientist's descriptions differ from the modal description of the soil series.

- ◆ Clarification of sampling for mechanical analysis. Sampling for mechanical analysis does not include a requirement for sampling of the parent material [BC, CB, or C horizon ("till" or densic material)].
- ◆ Clarification on the examination of soil characteristics using soil pits. When the soils are examined using a pit, the face of the pit wall must be fresh and moist with carefully limited "picking" at the time of examination. Therefore, the pit must be dug when the soil scientist is present and ready to do the evaluation.

The following procedure is included for use with the attached flow chart. Any changes in the following from my memorandum of June 19, 2001 are indicated by the above comments.

A. Use the "*FLOW CHART FOR EVALUATION OF RECESSIONAL MORAINЕ SOILS FOR ON-SITE SEWAGE SYSTEMS*" published by ISDH.

A flow chart has been developed to maintain a consistent procedure for the evaluation of sites located in or adjacent to the recessional moraine areas or that have any of the NRCS soil series listed below. The flow chart is attached.

B. Soil Series Associated With The Recessional Moraines

Certain landscape conditions and NRCS soil series are present in areas where these on-site system failures have been identified:

1. Blount
2. Bono
3. Glynwood
4. Hoytville
5. Milford
6. Montgomery
7. Morley
8. Nappanee
9. Pewamo
10. St. Clair
11. Sites that contain areas of severely eroded soils that have clay loam, silty clay loam, silty clay, or clay surface textures

C. Locating Potential Moraine Areas

A general map has been developed using the *Miscellaneous Map 49*, developed by Henry H. Gray, Quaternary Geologic Map of Indiana, 1989. It is used to generally locate those moraine areas in northeast Indiana that have a high potential for OSS failure.

D. Wabash Recessional Moraine Characteristics

1. These are the characteristics that have been identified in Wells County as being present when premature OSS failures have occurred. At the present time, not all of the characteristics have been identified in the other recessional moraine soils. Only an experienced professional soil scientist can look for these characteristics from an evaluation of the soil using a backhoe soil pit.

Therefore, all soils descriptions in these areas must be conducted by a soil scientist, soil specialist, soil classifier, or registered professional soil scientist certified by:

- the American Registry of Certified Professionals in Agronomy Crops, and Soils (ARCPACS),
 - the Indiana Association of Professional Soil Scientists (IAPSS), or
 - the Indiana Board of Registration for Soil Scientists.
2. A soil pit at least 24 inches wide must be used to closely examine the surface soil and the upper part of the subsoil for the Recessional Moraine characteristics. The soil must be described to a depth of 60 inches or to a layer which cannot be readily penetrated, whichever is shallower.

E. Mechanical Analysis (Particle Size Analysis)

1. When required, soil samples will be collected and mechanical analyses conducted on selected horizons in the individual soil profiles. These analyses will be completed using the Hydrometer Method of particle size analysis developed by Bouyoucos. A facility or laboratory accepted by the local health department having jurisdiction must conduct the analyses. Copies of the Hydrometer Method of particle size analysis will be forwarded to local health departments by separate memorandum.
2. Collect soil samples (100 grams each) for mechanical analysis to determine percent clay, sand, and silt for each sample. The following horizons must be sampled:
 - a. Surface horizon.
 - b. Any horizon or horizons that the soil scientist suspects might have problems with permeability or the horizon that has the highest percent clay in the subsoil.
 - c. If present, the horizon below suspected horizons that appear to be acceptable for "normal" permeability for these textures.

Sampling for mechanical analysis does not include a requirement for sampling of the parent material [BC, CB, or C horizon ("till" or densic material)].

F. Modified Permeability Test for Recessional Moraine Soils

When required, modified permeability tests will be used as a pass/fail test for water movement through the subsoil material. These tests will be required only when indicated by the results of the initial soil evaluation and mechanical analysis. An individual accepted by the local health department having jurisdiction will conduct the tests. A minimum of seven (7) test holes will be required for residential sites. Additional test holes may be required by ISDH for commercial on-site projects. The minimum 7 holes will be located as follows:

1. A minimum of five (5) test holes will be placed in the proposed soil absorption field site. One hole will be located near each inside corner of the site and the fifth hole located near the center of the site.
2. A minimum of two (2) additional test holes will be required in the downslope dispersal area for a residential site. These two (2) test holes will be dug so that they are located ten (10) feet below the proposed soil absorption field and located approximately 1/3 of

the distance from each of the outside corners of the proposed soil absorption field. A copy of the Modified Soil Permeability Test for Recessional Moraine Soils is attached.

G. Backhoe Soil Pits Will Be Used To Describe Soil Properties Used To Select System Type And Size OSS Soil Absorption Fields

The ISDH is adopting the procedure developed by the Wells County Health Department for their Wabash Recessional moraine soils to describe soils characteristics for selecting system type and size. During parts of the initial investigation, the soil scientist may have already completed some or all of the following requirements:

1. Minimum of two (2) soil pits.
 - a. One soil pit dug ten (10) feet directly upslope of the upslope edge of the proposed soil absorption field.
 - b. A second soil pit dug ten (10) feet below the downslope edge of the proposed soil absorption field.
 - c. Each soil pit must be at least (six) 6 feet long and two (2) feet wide. The depth of each soil pit must be sufficient to adequately describe the subsoil, but may be no greater than five (5) feet.
2. A minimum of five (5) soil borings taken in the proposed soil absorption field site, with one hole located near each corner of the site and the fifth hole located near the center of the site.

Finally, the following requirements will be applied to sites where on-site sewage systems are installed in soil containing more than 50 percent clay, the site passed the modified permeability test, and the site meets all other minimum state and local code requirements for permit issuance:

1. Observation ports will be installed in the absorption trench laterals and, when installed, in the perimeter drainage system.
2. The local health departments and ISDH will have the right to visit and inspect the system to determine the status of the system.
3. The local health departments and ISDH will have the right to conduct dye tests and to collect effluent and perimeter drain water samples for testing.
4. The testing and visits will be at the discretion of the local health departments and ISDH, but will be conducted during normal working hours unless the owner has been notified.

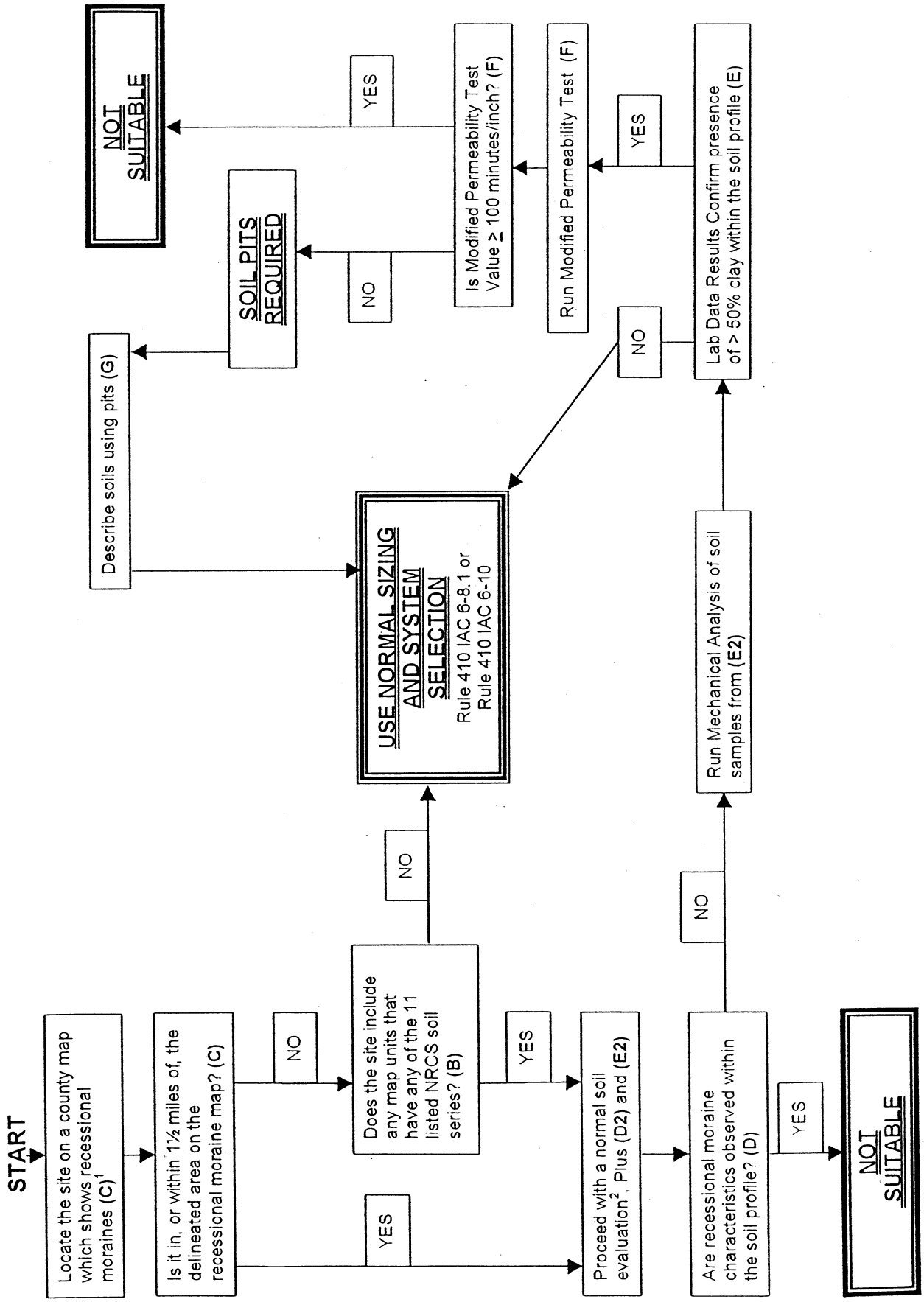
If you have questions or desire assistance prior to the workshops, please contact my on-site sewage staff at (317) 233-7177.

cc: On-Site Sewage Staff
Soil Scientists

Attachments

Flow Chart for Evaluation of Recessional Moraine Soils for On-Site Sewage System
The Modified Soil Permeability Test for Recessional Moraine Soils

FLOW CHART FOR EVALUATION OF RECESSIONAL MORAINIC SOILS FOR ON-SITE SEWAGE SYSTEMS



¹Bold letters in parenthesis () references corresponding letter in ISDH memorandum of 07/18/01 to local health departments
²Special care must be taken in observing and describing the soil horizons; especially the surface layers.

The Modified Soil Permeability Test for Recessional Moraine Soils

The Modified Soil Permeability Test will be used as a pass/fail test for water movement through the subsoil material in recessional moraine soils. It is similar to the percolation test except that:

- ◆ Only subsoil horizons are evaluated using the specific criteria. Surface horizons cannot be evaluated using this test.
- ◆ This test will be required only when indicated by the results of the initial soil evaluation and mechanical analysis.
- ◆ It is a "pass/fail" test. The sole purpose is to determine whether or not the soil will accept water. It is not used for system selection or sizing. System selection and size are determined from soil characteristics from soil pits and borings.
- ◆ This test is to be used on natural, undisturbed soils as a part of the procedures for recessional moraine soils evaluations. For a variety of reasons, this test is not suitable for use in other applications. Therefore, its use must be limited to this application.
- ◆ The failure test value shall be equal to or greater than 100 minutes/inch.

Procedure for the Modified Soil Permeability Test:

1. A minimum of seven (7) test holes will be required for residential sites. Additional test holes may be required by ISDH for commercial on-site projects. The intent of the procedure is to uniformly position the holes within the proposed OSS site. The minimum 7 holes will be located as follows:
 - a. A minimum of five (5) test holes will be placed in the proposed soil absorption field site. One hole will be located near each inside corner of the site and the fifth hole located near the center of the site.
 - b. A minimum of two (2) additional test holes will be required in the downslope dispersal area for a residential site. These two (2) test holes will be dug so that they are located ten (10) feet below the proposed soil absorption field and located approximately 1/3 of the distance from each of the outside corners of the proposed soil absorption field.
2. Notify the local health department of the date and time of the start of the modified soil permeability test at least one working day prior to the start of the test.
3. Dig or bore each hole with horizontal diameter dimension of eight (8) to twelve (12) inches.
4. Each test hole must have a minimum hole depth of at least 36 inches or be dug into densic material, whichever is shallower.
5. Remove all loose soil from each test hole.
6. Carefully fill each hole with clean tap water. Keep the hole full of water for at least 12 hours.
7. After the 12-hour saturation period, allow the water in the hole to seep away until it is below any A soil horizons at the site.
8. If needed add additional water until it just reaches the top of the first subsoil (B) horizon.
9. Establish a reference point by use of a nail stuck in the side of the hole at the top of the first subsoil (B) horizon.
10. From this point obtain a measurement to the top of the water level. Record the date, exact time, and the measurement.
11. Continue the measurement to the top of the water surface while recording the date and time until at least three (3) consecutive readings of consistent rates are obtained.
12. Convert the time interval obtained in (11) above to minutes and divide this figure by the number of inches of water which has seeped away in that interval to obtain the time for one inch of water to seep away.

If any test hole in the area being tested fails, the area being tested for the proposed absorption field is deemed unsuitable for any type of on-site system. An adjacent area can be evaluated as a new site, as long as the new area is a minimum of fifty (50) feet away from the location of any test hole(s) that have failed. Any of the test holes that previously passed this test can be utilized as test holes for the new area, if they meet the requirements for the new location.