DEQ	OFFICE OF WASTE MANAGEMENT AND RADIOLOGICAL PROTECTION POLICY AND PROCEDURE		DEQ OF ENVIRONMENTAL QUALITY
Original Effective Date: July 3, 2002 **Revised Date:** **Reformatted Date:** November 30, 2012	**Subject:** Natural Soil Barrier Certification Documentation **Division/Office and Program Names:** OWMRP-Solid Waste Section, Solid Waste Program		**Category:** ☐ Internal/Administrative ☐ External/Non-Interpretive ☒ External/Interpretive
	Number: OWMRP-115-26	**Page:** 1 of 3	

A DEQ of Environmental Quality (DEQ) Policy and Procedure cannot establish regulatory requirements for parties outside of the DEQ. This document provides direction to DEQ staff regarding the implementation of rules and laws administered by the DEQ. It is merely explanatory; does not affect the rights of, or procedures and practices available to, the public; and does not have the force and effect of law.

INTRODUCTION, PURPOSE, OR ISSUE:

The purpose of this policy and procedure is to provide guidance on acceptable methods of verifying natural soil barriers used in the construction of solid waste landfills.

AUTHORITY:

Part 115, Solid Waste Management, of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as amended.

STAKEHOLDER INVOLVEMENT:

This policy was developed with input from the Michigan Waste Industries Association, Technical Standards Committee.

DEFINITIONS:

The composition of a natural soil barrier is defined in Rule 104(f) of Part 115 as "any combination of natural or recompacted solid which is not less than 10 feet thick and which consists predominately of soils that have a unified soil classification of SC, ML, CL, CL/ML, or CH. A natural soil barrier may contain soil types other than SC, ML, CL, CL/ML or CH if the anomalous soils are not hydraulically connected to the uppermost aquifer, do not extend beyond the solid waste boundary, and are not considered as part of the thickness determination."

POLICY:

Rule 912 of Part 115 requires verification of a natural soil barrier used in landfill construction. The composition of a natural soil barrier is defined in Rule 104(f). Read together, these rules require a demonstration of the effectiveness of the natural soil component of landfill liner systems, including the side slopes and cell bottom. This demonstration can be completed prior to issuance of a construction permit, or a plan can be approved as part of a construction permit to complete the demonstration prior to cell licensure. This includes identification and delineation of any sand seams, root layers, saturated materials, desiccation cracks, solution zones, and

other features that will increase the hydraulic conductivity of liquids through the natural soil barrier layer.

Rule 912(4) requires the facility owner or operator to obtain soil borings on grid spacing approved by the Director of the DEQ. In general, the DEQ considers that an adequate grid spacing would consist of a minimum of one boring per acre, or portion of an acre to be certified, centered unless the DEQ approves an alternative location. Borings should be placed evenly on a grid pattern within the footprint of the cell unless another grid pattern is approved by the DEQ in accordance with the provisions specified by Rule 912(4). Geophysical methods (or other subsurface testing methods) may be used to replace or supplement test borings specified in Rule 912(4), if a work plan for such a survey is approved by the Director or his or her representative in accordance with the provisions specified by Rule 912(5) prior to the work plan being initiated.

Soil borings must utilize continuous sampling methods throughout the depths, or zone, of certification. Representative samples must be collected and tested for all of the items listed in Rule 912(3).

On a case-by-case basis, the number of hydraulic conductivity tests required by Rule 912 may be reduced if all of the following criteria are met:

1. Hydraulic conductivity data from other areas, per Rule 920 has been submitted and accepted as appropriate.

2. An established relationship among particle size distribution, soil type, atterberg limits, and hydraulic conductivity has been determined.

3. The boring data submitted is representative of existing site conditions.

4. Boring data submitted was taken from previously agreed upon strategic locations.

5. Available hydraulic conductivity and soil boring data indicates that the site soils appear homogenous in nature.

6. The percent distribution of sand, silt, and clay has been determined for soil samples meeting the minimum requirements for hydraulic conductivity for a natural soil barrier.

7. The boring samples considered for elimination of hydraulic conductivity testing:

    a. Exhibit less than a five percent variation in clay, sand, or silt content (established by sieve and hydrometer testing) from the samples tested and meeting the acceptable standards for hydraulic conductivity, and

    b. The variation does not change the atterberg limits and result in a Unified Soil Classification System classification of ML or SM.

Unsuitable materials or saturated conditions encountered within the zone of certification must either be excavated until acceptable soils and conditions are reached or those materials must not be included in the zone to be certified. Exclusion requires full delineation of the horizontal extent of the unsuitable materials or conditions by additional borings or, on a case-by-case basis, geophysical methods approved per Rule 912(5). It is expected that the additional borings would consist of at least eight borings placed radially, no more than 45 degrees apart, and stepped out sufficiently to conclusively delineate the excluded area. It is recommended that a work plan be submitted to the DEQ for concurrence, prior to initiating this work.

The evaluation of site earth materials required by Rule 904(4)(e) as part of the facility hydrogeologic report must be submitted in conjunction with certification of the natural soil barrier pursuant to Rule 912. The items listed in Rule 904(4)(e)(i) - (iv) must be included in the log for each soil boring. Further, the geologic cross-section required by Rule 904(4)(f) must include a compilation of all boring logs for the site referenced to a site map with cross-sections identifying the items listed in Rule 904(4)(f)(i) - (viii). This includes borings used to certify the natural soil barrier.

REFERENCES:

The Unified Soil Classification System standard may be found in ASTM D2487-11: "Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)." The ASTM standard may be purchased from the American Society for Testing and Materials, Sales Services, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania, 19428 or from the ASTM Web site at www.astm.org.

OFFICE CHIEF APPROVAL:

Elizabeth M Browne

Elizabeth M. Browne, Chief
Office of Waste Management and Radiological Protection

November 16, 2012
Date

DEPUTY DIRECTOR APPROVAL:

Jim Sygo

Jim Sygo, Deputy Director

NOVEMBER 30, 2012
Date