



Interim Final – May 2006

**RRD OPERATIONAL MEMORANDUM No. 4**

**SUBJECT: SITE CHARACTERIZATION AND REMEDIATION VERIFICATION**

Key definitions for terms used in this document:

<b>NREPA:</b>	<a href="#"><u>The Natural Resources and Environmental Protection Act, 1994 PA 451, as amended</u></a>
<b>Part 201:</b>	<a href="#"><u>Part 201, Environmental Remediation, of NREPA</u></a>
<b>Part 213:</b>	<a href="#"><u>Part 213, Leaking Underground Storage Tanks, of NREPA</u></a>
<b>MDEQ:</b>	<a href="#"><u>Michigan Department of Environmental Quality</u></a>
<b>RRD:</b>	<a href="#"><u>Remediation and Redevelopment Division</u></a>
<b>BEA:</b>	<a href="#"><u>Baseline Environmental Assessment as defined under Part 201 of NREPA</u></a>
<b>Criteria or criterion:</b>	Includes the cleanup criteria for Part 201 of NREPA and the Risk Based Screening Levels as defined in Part 213 of the NREPA and R 299.5706a(4)
<b>Facility:</b>	Includes “facility” as defined by Part 201 of NREPA and “site” as defined by Part 213 of NREPA
<b>RBCA:</b>	Part 213 Risk-Based Corrective Action process
<b>Release:</b>	Includes “release” as defined by Part 201 and Part 213 of NREPA
<b>Remedial Decisions:</b>	Decisions on the actions necessary to remediate a Part 201 facility or Part 213 site compliant with applicable statutory and rule provisions
<b>Remedial Investigation:</b>	This term is used in Part 201 and defined by R 299.5103(j) as an evaluation to determine the nature, extent, and impact of a release or threat of a release and the collection of data necessary to conduct a feasibility study of alternate response activities or to conduct remedial action at the facility
<b>Response Action:</b>	Includes “response activities” as defined by Part 201 of NREPA and “corrective action” as defined by Part 213 of NREPA
<b>Site Assessment:</b>	This term is used in Part 213 and defined by the RBCA process as an evaluation of subsurface geology, hydrology, and surface characteristics to determine if a release has occurred, the levels of the chemical(s) of concern (CoCs), and the extent of the migration of the CoCs

This operational memorandum has been prepared to facilitate implementation of Part 201 and Part 213 of NREPA, by providing direction for the generation of data for facility characterization and monitoring to support remedial decisions. Remedial decisions under Part 201 and Part 213 of NREPA must assure the protection of public health, safety, welfare, and the environment (Section 20118 and Section 21304a of NREPA). Adequate evaluation of the nature, extent and impact of a release or threat of a release, monitoring progress of response actions, and assessment of exposure pathways for compliance with cleanup criteria is integral to assuring compliance with Part 201 and Part 213 of NREPA.

The sampling strategies identified in this document represent acceptable approaches and



ranges of appropriate assumptions that are intended to support consistent exercise of professional judgment in a manner that produces satisfactory outcomes. Alternative approaches may be used if the person proposing the alternative demonstrates that the approach meets all requirements of the statute and rules.

The technical standards warranted for facility characterization are dependent on the purpose and objective of the characterization. The technical standards necessary to adequately support a BEA (R 299.5907) are generally different from what is necessary to demonstrate compliance with due care obligations (R 299.5915, R299.1013), or to meet the requirements for a Part 201 Remedial Investigation (R 299.5528) or a Part 213 RBCA Site Assessment (Section 21304a of NREPA). The requirements for monitoring can be different than for characterization.

This Operational Memorandum provides sampling strategies for facility characterization appropriate for due care compliance, Part 201 Remedial Investigations, and Part 213 RBCA Site Assessments. The sampling strategies provided assure that characterization of the nature and extent of a release or threat of release is adequate to fully delineate the extent of contamination, properly evaluate potential exposure pathways, and support remedial decisions. It should be noted that although elements of this document may be useful for conducting BEAs, it is not necessarily intended to provide standards for such.

In addition to sampling strategies for facility characterization, this document also provides strategies for remediation verification for:

- (1) Evaluating the progress of a response action or actions;
- (2) Monitoring the effectiveness of a remediation strategy (including monitoring for and evaluating the development of potential hazards or exacerbation of contamination associated with the remedial technology);
- (3) Verifying that contaminant concentrations meet the criteria for closure.

This Operational Memorandum includes sampling strategies for the following media:

- Soil (Attachment 1 – *under development*)
- Groundwater (Attachment 2 – *under development*)
- Sediments (Attachment 3)
- Soil Gas and Indoor Air (Attachment 4 – *under development*)

Direction also is provided for specific facility characterization issues or conditions associated with the following:

- Methane (Attachment 5 – *under development*)
- Non-Aqueous Phase Liquids (NAPLs, Attachment 6 – *under development*)
- Groundwater Modeling (Attachment 7)
- Monitored Natural Attenuation (MNA, Attachment 8 – *under development*)
- In-Situ Treatments to Enhance Biologic and Chemical Degradation (Attachment 9 – *under development*)
- Groundwater Not In An Aquifer (GWNIAA, Attachment 10 – *under development*)
- Sites Contaminated with Petroleum Products (Attachment 11 – *under development*)
- Field Methods (Attachment 12 – *under development*)

This Operational Memorandum incorporates by reference the MDEQ Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria. Direction on how to properly collect, handle, preserve and analyze samples is provided in RRD Operational Memorandum No. 2. It is specifically



noted within an attachment when the attachments to this Operational Memorandum supersede previous MDEQ guidance.

State programs administered under other parts of NREPA and Federal programs may have requirements in addition to those described in this document. Questions about the appropriate sampling strategies for such programs should be addressed to the appropriate program staff.

Andrew W. Hogarth, Chief  
Remediation and Redevelopment Division

Dated: May 2, 2006

Attachments

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This memorandum and its attachments are intended to provide direction to foster consistent application of Part 201 and Part 213 of NREPA, and associated Administrative Rules. This document is not intended to convey any rights to any person nor itself create any duties or responsibilities under law. This document and matters addressed herein are subject to revision.