

Committee Guidance
Land Conservation Committee
Original 4/15/2009
Amended 9/17/2009

PLAN CONTENT, SPECIFICATIONS AND ENGINEERING REQUIREMENTS FOR NON-METALLIC MINE CONSTRUCTION IN BEDROCK

Purpose

Non-metallic mines constructed in bedrock pose unique challenges that are not encountered when mining sand and gravel from unconsolidated glacial deposits.

Failure to adequately plan, design, operate, and reclaim mines in bedrock can:

1. Result in offsite environmental impacts that can damage property and pose a threat to the public health, safety, and welfare.
2. Increase the operational costs of mining and phased reclamation.
3. Add significantly to the public costs of reclamation plan review and permit oversight.

This administrative guidance has been developed to clarify the content and design requirements of reclamation plans submitted for commercial non-metallic mines proposed in bedrock that are subject to the Chippewa County Non-Metallic Mining Ordinance.

Note 1: This guidance does not apply to small quarries or borrow sites that are currently allowed and exempt from ordinance requirements under NR 135.02(3).

Note 2: For the purposes of this guidance the county has adopted the definition of bedrock as contained in NR 213.04 as follows: "Bedrock" means the rocks that underlie soil material or are at the earth's surface which are encountered when the weathered in-place consolidated material, larger than 2 millimeters in size, is greater than 50% by volume.

Engineering Assurance

Upon considering the physical characteristics of the site and scope of mine operations, professional engineering and design computations may be required to assure that the reclamation standards of the ordinance can be met.

In making this determination, the regulatory authority will consider the physical characteristics and limitations of the site, the scope of the mine facility, and the intensity and duration of the facility's operations.

The type and extent of engineering will be limited to that necessary to meet physical site limitations, and to assure that the reclamation standards established in NR 135 Subchapter II can be achieved.

Engineering will be required for mines constructed in bedrock when any of the following threshold criteria are met:

1. Presence of high walls or steep side slopes that:
 - A. Have a mine face that will be greater than 20 feet in height, or,
 - B. Warrant concerns for stability during contemporaneous mining and reclamation operations, under standards of NR135.10.
2. The site is externally drained, or where storm water runoff or other discharge is expected from the site.
3. The total projected, or potential built-out, area of mine is greater than 5 acres over the life of the mine.

Monitoring and Reporting Requirements

The applicant, independently or through a professional engineer, is to develop the following documents:

1. A Reclamation and Construction Inspection Plan. The plan will document the reclamation activities and type and sequence of inspections that are proposed to verify that the planned reclamation practices are properly installed.
2. An Annual Reclamation Report and Activities Plan. The report will document the reclamation activities completed throughout the past year and the activities planned for the upcoming year.

Plan Contents and Specifications

The scope and preliminary detail of the reclamation plan is to be adequate to allow for critical public and third party engineering review.

1. All requirements in Plan Specifications for Non-Metallic Mines in Chippewa County (Appendix II, Chippewa County Non-Metallic Mining Reclamation Ordinance) apply.
2. Additional minimum requirements for mines in bedrock:
 - A. Groundwater Management (NR135.08 & 135.19)
 - (i). Depth to water table
 - (ii). Volumetric storage capacity of unsaturated bedrock.
Note: Volumetric storage capacity is only required when the water table is within 20 feet of the proposed final floor elevation of the mine.
 - (iii). Groundwater elevations and Range of seasonal and historic groundwater fluctuations.
Note: Groundwater elevations are only required when the water table is within 20 feet of the proposed final floor elevation of the mine.
 - (iv). Infiltration rate of bedrock.
Note: Infiltration rates are only required when stormwater ponds are proposed in bedrock.
 - B. Surface Water and Stormwater Management (NR135.07 & 135.19)
 - (i). Percentage of runoff routed to stormwater ponds, versus infiltration, versus internal site drainage.
 - (ii). Diversion of existing surface water flows.
 - (iii). Water detention ponds
 - Size: area, depth
 - Hydrologic budget (for 100 year event): inflow, outflow, seepage, evaporation, etc.

- Inflow and outflow: channels, piped, pumped
- Design for settling of solids;
Note: Design for settling of solids only applies when the mine will be externally drained. (WI-DNR Non-Metallic Mining Operations General Permit No. 0046515-05)
- Inlet and outlet protection
- Emergency spillway
- Pond maintenance requirements, including sediment removal and disposal

Note: Water detention pond details are only required when stormwater ponds are proposed to meet the requirements of NR 216.22

- (iv). Provide a copy of proof of coverage for the site under WPDES Permit for Nonmetallic Mining, under NR216.21, or other required state stormwater permit.

C. Soil and Overburden Management (NR 135.09 & NR 135.19)

- (i). Document thickness and volumes of topsoil (A horizon), subsoil (B horizon), and overburden to be stripped and stored.
Note: Thickness and volume of "overburden" (material not including A-horizon & B-horizon soils) is only required for mines greater than 20 feet deep with a highwall as defined in NR135.03.
- (ii). Stripping process for topsoil, subsoil, and overburden over the full extent and life of the mine.
- (iii). Separate stockpiling of each soil horizon and overburden over the full extent and life of the mine.
- (iv). Stockpile location, construction, and stabilization.
- (v). Screening berms: location, dimensions, erosion control, seeding.
- (vi). Interim management of externally generated soil materials (examples include processing fines or topsoil substitute).
- (vii). Vertical management of mining (# of lifts, etc.)
Note: Vertical management of mining is only required for mines greater than 20 feet deep.

D. Slope Reconstruction (NR135.10 & NR135.19)

Note: Section D, only required for mines greater than 20 feet deep with a highwall as defined in NR135.03.

- (i). General sequence.
- (ii). Material source(s). Examples include overburden, rejected mine material on site, hauled in fill materials. Hauled in materials may include processing fines or fill materials from other sources.
- (iii). Offsite materials and testing. Provide a testing protocol, in advance, for hauled in fill materials, solid wastes, or other materials proposed for use in reclamation.
- (iv). Estimate of volume of overburden available for slope reconstruction; relation to volume of material needs for slope reconstruction.
- (v). Details of slope construction process.

(vi). Management of inactive unreclaimed mine faces.

E. Topsoil Reestablishment (NR135.11 & NR135.19)

- (i). Details of soil application process.
- (ii). Reestablishment of soil horizons, i.e. topsoil (A horizon) and subsoil (B horizon).
- (iii). Measures to limit compaction.
Note: Measures to limit compaction are only required for mines with slopes longer than 60 feet.
- (iv). Vegetation rooting depth for selected vegetation types.
- (v). Erosion control.

F. Site Revegetation (NR135.12 & NR135.19)

Note: Section F is only required for mines with slopes longer than 60 feet.

- (i). Length of slope limitations.
- (ii). Type of vegetation by area (side slopes, bottom, and hilltop).
- (iii). Soil fertility and pH.
- (iv). Planting techniques.
- (v). Cover density, monitoring verification - noxious weeds and invasive species control.

G. Long-Term Slope Stability (Function of Slope % and Slope Length) (NR135.10 & NR135.19)

- (i). Long-term stability. Engineered products (erosion control blankets, etc.). Engineered structural measures (terraces or water diversions, etc.).
Note: Long term stability is only required for mines with slopes longer than 60 feet.
- (ii). Length of slope limitations.
Note: Length of slope limitations is only required for mines with slopes longer than 60 feet.
- (iii). Type of permanent vegetation (grasses versus planted shrubs/trees versus grasses and volunteer trees).
Note: Type of permanent vegetation is only required for mines with slopes longer than 60 feet.
- (iv). Construction site erosion control measures.