

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD

LAND RECONSTRUCTION, CURRENTLY MINED LAND

(Acres)

CODE 544

DEFINITION

Restoring currently mined land to an acceptable form and for a planned use.

SCOPE

This standard applies to the identification, removal, stockpiling, and replacement of soil materials on currently mined prime farmland. It also applies to nearby areas that can be affected by the mining of various minerals or commodities.

PURPOSE

To prevent permanent damage to soil and water resources in and near mined areas. To restore the productivity of prime farmland soils to permit their premining use or a more intensive use. To control erosion, preserve the environment, maintain the visual quality of the landscape, and provide an economic use of the land.

CONDITIONS WHERE PRACTICE APPLIES

Areas of prime farmland disturbed or affected by surface or underground mining. This includes those areas used for haul roads, soil stockpiling, sediment ponds, and other mining related uses.

SOIL REMOVAL

Planning Considerations

Use a soil survey and field investigation to identify the soil name and slope, erosion, and textural phases. Use a modern soil survey that meets the standards of the National Cooperative Soil Survey.

Consider the overall surface relief to be removed.

Consider surface and internal drainage conditions, flooding frequency, and surface or subsurface drainage systems used.

Consider the soil description of the representative soil profile for the county where the named soil is to be removed. Refer to the published soil survey or soil description provided by a soil scientist.

Note soil properties such as color, texture, and content of coarse fragments; density of major horizons, soil depth and thickness of topsoil, B horizons and C horizons, if present, from the soil description for the soil map unit.

Consider soil moisture conditions as affected by seasonal precipitation.

SPECIFICATIONS

Soil removal shall be completed by:

- a) Removing the topsoil layer (A, Ap, AE, AB, E horizons) and transporting to designated area. If the natural topsoil layer is less than six inches thick, remove the top six inches and treat as topsoil.
- b) Removing the entire B horizon (BA, BE, B and BC horizons) to an original soil depth of 48 inches or to Cr and R horizons and transporting to a separate, designated area. If C horizon (other than Cr) exists above 48 inches, these horizons will be treated as subsoil. The quantity and quality of C horizon material in the subsoil stockpile will not exceed that of the original soil between the topsoil and a depth of 48 inches.

Soil removal shall occur within soil moisture ranges that will minimize compaction.

SOIL STOCKPILING*

Planning Considerations

Use a modern soil survey and field investigations to evaluate soils being considered as sites for stockpiling. Consider the surface relief, percent slope, surface drainage and internal drainage conditions, susceptibility to slippage, flooding, and the presence of springs or seeps on hillsides.

Consider the time of year, duration of stockpiling, and general wetness conditions of the area to be used for stockpiling.

Consider measures to control erosion and off-site movement of soil materials.

Recognize the importance of positive drainage on stockpile surfaces.

Consider the effects of stockpiling on prime farmland soils used as stockpile sites.

SPECIFICATIONS

Sites subject to flooding or slippage will be avoided as sites for stockpiling.

Prepare the stockpiling area by removing all woody vegetation and other materials that may interfere with placement or removal of stockpiled soil.

Stockpile topsoil material.

Stockpile B and C horizons in a separate location from topsoil material.

If stockpiled soil material will not be used for reconstruction within 30 calendar days, stockpiles will be seeded, mulched, or otherwise treated to control erosion. Use specifications found in Section IV of the NRCS Technical Guide.

Construct berms, diversions, or other temporary practices when necessary to prevent soil from eroding from the stockpile area.

Soil stockpiling shall occur within soil moisture ranges that will minimize compaction.

Where topsoil, B and C horizon material is not used for reconstruction concurrently with mining or placed in stockpiles, it shall be spread within the permit boundaries in accordance with 30 CFR 816.22 or 817.22.

*Stockpiling is not required where the method of mining allows the soil removal and reconstruction operations to be carried out concurrently.

SOIL RECONSTRUCTION

Planning Considerations

Use a modern soil survey and field investigation to determine the chemical and physical properties of the soil before mining.

Consideration will be given to the use of earth moving equipment and techniques that minimize soil compaction.

Consider the use of chiseling, ripping, or equivalent treatment in the upper part of the B horizon before topsoil replacement to reduce compaction and increase porosity.

Consider reconstruction techniques that will result in a better-drained, less erosive and more productive soil than existed prior to mining.

SPECIFICATIONS

Reconstruction shall occur within soil moisture ranges that will minimize compaction.

Reconstruction shall be completed to a minimum depth of 48 inches or to the depth of the unmined soil if the Cr or R horizons occur above 48 inches.

B and C horizon material shall be returned to the mined area and placed on graded spoils at a uniform thickness not less than that of the unmined B and C horizons above 48 inches.

Topsoil material shall be returned to the mined area and placed on the B and C horizons at a uniform thickness not less than that of the unmined topsoil or to a minimum of six inches if the unmined surface layer is less than six inches thick.

The major horizons of the reconstructed soil will have a texture and reaction within the ranges of the unmined soil.

Final grading of the reconstructed soil shall provide positive surface drainage and uniform slopes no steeper than an average of five percent.

Porosity of the topsoil and B and C horizons after reconstruction shall permit penetration of roots.

Seeding, mulching, and other erosion control measures shall be completed as soon as weather conditions permit after replacement of topsoil. Use specifications found in Section IV of the NRCS Technical Guide.

Avoid excessive trafficking of earthmoving and grading equipment that reduces porosity, and makes root penetration more difficult.

SOIL REVEGETATION

Planning Considerations

Soil tests are to be considered to determine nutrient levels of the reconstructed soil.

Drainage, slope, aspect, and other physical properties of the reconstructed soil will be considered in selecting an adapted seeding mixture.

A seeding mixture will be selected to control soil erosion.

SPECIFICATIONS

Use accepted methods for seedbed preparation and seeding. The last tillage operation shall be performed on the approximate contour.

Lime and fertilizer will be applied according to soil test recommendations for the targeted yield.

Seeding – The current Ohio Agronomy Guide will be used to select legume and grass seeding mixtures and seeding rates. All legume seed shall be inoculated with the proper type of inoculate to ensure the presence of adequate numbers of the desired bacteria for nitrogen fixation at the time of seeding.

Mulching (When grasses and legumes are seeded) – Mulch shall consist of cereal grain straw or quality hay mulch. Cereal grain straw (preferably wheat or barley) shall be applied at 2 air dried tons per acre and anchored. Hay mulch shall be applied at 2-1/2 air dried tons per acre and anchored. Mulch may be anchored with asphalt emulsion at a rate of 160 gallons per acre or a crimper may be used.

Management – Areas will be promptly reseeded to control erosion and establish an adequate stand (80 percent of ground cover). Any harvesting will be delayed until new seedlings have made a minimum growth of ten inches.

RESTORING SOIL PRODUCTIVITY

Planning Considerations

Soil tests are to be considered in determining nutrient levels of the reconstructed soil.

The landowners' objectives should be defined and considered during the development of management systems for restoration of productivity.

All crop residues from row crops should remain on the field after harvest to help control erosion and increase soil organic matter content. Supplementing these residues with manure, sewage sludge, or their suitable organic materials is also recommended.

Soil tilth will be improved by including grasses and deep-rooted legumes in the rotation.

Corn, soybeans, wheat, oats, or grass-legume hay will be used as the reference crop. The current Ohio Cooperative Extension Bulletin 685 will be used to determine target yields for reference crops.

SPECIFICATIONS

Conservation practices such as contour farming, conservation tillage, crop rotation, and terracing will be applied to protect the resource base and control sheet and rill erosion at or below the allowable soil loss tolerance (T) for the planned mapping unit.

Water management practices such as grassed waterways, diversions, and grade stabilization structures will be installed where appropriate and maintained to control gully erosion.

Lime and fertilizer will be applied as recommended by soil tests as an integral part of meeting targeted yields of reference crops.

Drainage limitations of reconstructed soils will be corrected as needed by installing surface and/or subsurface drainage systems.

Tillage or ripping will be performed as needed to fracture any root limiting layers.

Currently accepted techniques will be used to control pests and plant diseases.

Technical References

1. Agricultural Handbook (AH 537), Predicting Rainfall Erosion Losses.
2. Ohio Cooperative Extension Bulletin 572, Agronomy Guide.
3. Sections II and IV of NRCS Technical Guide.
4. Ohio Cooperative Extension Bulletin 598 Rev., Land Application of Sewage Sludge, 6/79.
5. USDA-FS Technical Report NE-68, A guide for Revegetating Coal Minesoils in the Eastern United States, 1981.
6. U.S. Department of Agriculture, Agricultural Handbook No. 536, Soil Taxonomy.
7. U.S. Department of Agriculture, Agricultural Handbook No. 18, Soil Survey Manual, and subsequent revised chapters 3, 4, 5, 6, 7, and 9.
8. U.S. Department of Agriculture, National Soil Taxonomy Handbook, Amendments to Soil Taxonomy.
9. U.S. Department of Agriculture, National Soils Handbook.
10. Ohio Crop Reporting Service, Ohio Agricultural Statistics, June 1983, NRCS, Columbus, Ohio 11/83.
11. Prime Farmland Map Units of Ohio, Current Edition, NRCS.
12. Ohio Cooperative Extension Bulletin 685 Rev., Ohio Soils with Yield Data and Productivity Index, 7/83.
13. Surface Mining Control and Reclamation Act of 1977, 30 U.S. C. 1201 et. Seq., Section 701 (20); Definition of Prime Farmland.