
	U.S. DEPARTMENT OF THE INTERIOR OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT DIRECTIVES SYSTEM	Subject Code: TSR - 16
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Subject: Reforestation of Title IV and Title V mined lands		
Approval: 		Title: Director

1. **Purpose.** Much of the land being surface mined for coal, particularly in the eastern United States, was woodland or forestland prior to being mined. However, past regulatory emphasis under SMCRA has been on achieving land stability which has resulted in smoothly graded, compacted mine soils and the establishment of aggressive vegetative ground covers to control erosion. This type of reclamation has lead many mine operators and landowners to choose agricultural land uses dominated by grasses and forbs, despite the lack of agricultural infrastructure in many areas, over those that include trees. Trees that are planted in smoothly graded areas with heavy vegetative ground cover are unlikely to survive or thrive. The few that do survive are often stunted. Such areas have little potential for supporting healthy productive forests. The significant forest fragmentation resulting from these conventional reclamation practices has led to reduced carbon sequestration, loss of wildlife habitat, increased flood potential, loss of forest products, etc. The purpose of this Directive is to lay out OSM's role in reversing this trend. OSM will promote reforestation where existing forests were removed by mining and, when practical, encourage forest establishment after reclamation wherever coal is mined.

2. **Summary of Changes.** This is a new Directive.

3. **Definitions.**

a. **Forestry Reclamation Approach.** A scientifically based method of reclaiming surface coal mines to increase tree survival and growth and to expedite the establishment of forest habitat through natural succession. The five steps of the Forestry Reclamation Approach (FRA) are:

(1) Create a suitable rooting medium for good tree growth at least four feet deep and comprised of topsoil and/or the best available material.

(2) Limit any grading of the rooting medium established in step one in order to avoid/limit compaction.

(3) Use ground covers that are compatible with growing trees.

(4) Plant two types of trees - early succession species for wildlife and soil stability, and commercially valuable crop trees.

(5) Use proper tree planting techniques.

b. Commercially valuable crop trees. Timber species, native to the area, selected for their commercial market value and their ability to serve as a seed source for further establishment of the trees.

c. Early succession species. Tree and shrub species, native to the area, selected for their ability to survive in the open conditions commonly found on newly reclaimed mine sites and their ability to support wildlife and soil improvement.

d. Non-compacted rooting medium. The top layer of soil or soil-substitute materials (four feet or more in depth) that has been placed with little or no grading in order to avoid compaction. For sites already compacted, ripping the soil surface should be employed to reduce compaction.

e. Ground covers compatible with growing trees. Because groundcover species compete with tree seedlings for light, water and nutrient resources and provide habitat for animals that feed on tree seedlings, groundcover should be limited to that necessary to control erosion. Aggressive species should not be used for groundcover. Ground cover for erosion control can also include organic and inorganic mulches, tree stumps and roots, and non-erodible rock fragments.

4. **Policy.** Forests constitute a unique and highly valuable resource, both ecologically and economically. It is OSM policy to promote reestablishment of forests on Title IV and Title V mine sites by addressing the technical, regulatory, and cultural barriers to successful reforestation of mined land.

The OSM will encourage the widespread and routine planting of native high-value trees on reclaimed coal mined lands throughout forested areas of the United States that will restore the uses and ecosystems provided by forests prior to

mining. In doing so, OSM will promote using reclamation practices that increase the survival rates and growth rates of planted and volunteer trees and expedite the establishment of forest habitat through natural succession. Such reclamation will enhance compliance with statutory mandates to restore affected land to a condition capable of supporting potential land uses that were present prior to any mining (section 515(b)(2)), and establishment of a diverse, effective and permanent vegetative cover capable of self generation and plant succession (section 515(b)(19)).

Mine reclamation using proper techniques will restore healthy and productive forests that minimize soil erosion, remove carbon dioxide from the atmosphere, provide wildlife habitat (including supporting ecosystems favored by endangered species of the interior forest, such as migratory birds and bats) support diverse plant species, and help conserve water resources and reestablish riparian habitats. Additionally, reforestation of coal mined land can provide important recreational areas for hunting, hiking, camping, mountain biking, etc.

Before an Asian blight destroyed the American chestnut tree throughout its natural range in the first half of the twentieth century, it was the monarch of the eastern deciduous forest with enormous ecological and economic value. Because, the coal fields from Mississippi to Pennsylvania coincide with much of that natural range, reclamation of surface mined land provide a unique opportunity for reintroducing blight resistant strains where they may serve as vectors for spreading this magnificent tree. OSM will promote, with all interested partners, the use of reclaimed mine lands as sites for the reintroduction of the American chestnut throughout its natural range.

5. **Responsibilities.**

a. The Assistant Director, Program Support (AD, PS) is responsible for ensuring that NTTP courses are consistent with the policy in this directive.

b. The Regional Directors are responsible for actively promoting land uses at Title V mine sites that include planting trees, using proper techniques, where the land was forested prior to mining, particularly where OSM is the Regulatory Authority. They will also encourage reforestation of Title IV sites. In fulfilling these responsibilities, they will actively promote partnerships with states, industry, landowners, academic experts, and other interested parties at local, state, and regional levels.

c. The Division Chief responsible for technical support within each regional office will develop and maintain, in coordination with the Regional Technology Transfer Team, a regional strategy for reforestation success. This should include building partnerships with academic institutions within the region to promote the development and application of best technologies in reforestation.

d. Field Office Directors/Field Division Chiefs (FODs) are responsible for promoting reforestation efforts with their assigned states, including Arbor Day events, education initiatives with Regulatory and AML personnel on proper reforestation techniques, building partnerships, etc. to address the technical, regulatory, and cultural barriers to successful reforestation in each state.

6. Procedures.

Reforestation should be accomplished employing science-based techniques. The Forestry Reclamation Approach (FRA) defined in this Directive is such an approach. Because application of the five general principles in FRA has demonstrated successful tree growth and survival, they should be used to the extent possible. As the science of reforestation of mined land evolves, these principles may be further refined.

A significant barrier to successful reforestation is the long-standing perception of what good reclamation should look like. It is not always a smoothly graded surface with heavy groundcover. A non-compacted growth medium for trees is usually rough and sometimes rocky. Reclamation of this nature may not be aesthetically pleasing in the short term, leading to cultural barriers that prevent people from accepting the use of the FRA in reclaiming mines. However, the science behind the FRA has proven that it is superior for establishing healthy and productive forests.

Employees at all levels within OSM will actively work together to overcome the cultural barriers to the FRA and inform mining companies, equipment operators, regulatory authorities, AML Programs, and landowners about the benefits of this proven practice. Such an endeavor requires significant communication in a wide range of forums.

a. OSM will continue to promote national, regional, state and local, reforestation initiatives that educate the industry, regulatory authorities, and public on the benefits of forests and of using FRA on reclaimed mines.

b. The principles of the FRA should be included in mining permits in Federal program States where the approved postmining land use requires the planting of trees or shrubs. Further, OSM will encourage operators and landowners to select a postmining land use that includes trees. Additionally, OSM will encourage State Regulatory Authorities to promote land uses that include tree planting and include FRA provisions in those permits.

c. OSM will promote partnerships with reforestation researchers and practitioners in the scientific community and elsewhere. OSM will support and seek the latest research, data, and best management practices that continue to define the FRA and its application under differing field conditions. OSM will continue to take an active role in identifying reforestation research needs so that unique mining operations, special soil conditions, special reforestation problems, etc. are adequately and timely addressed by researchers and practitioners.

d. OSM's National Technical Training Program (NTTP) will support this national policy and the procedures for reforestation of Title IV and Title V mine sites by incorporating the principles of the FRA in its reforestation and soils and revegetation courses, including regionally-oriented courses.

7. **Reporting Requirement.** None

8. **Effect on Other Documents.** None

9. **References.**

a. Angel, P., V. Davis, J. Burger, D. Graves, C. Zipper. 2005. The Appalachian Regional Reforestation Initiative. U.S. Office of Surface Mining. Forest Reclamation Advisory Number 1. 2 p. (available from <http://arri.osmre.gov/>).

b. Burger, J., D. Graves, P. Angel, V. Davis, C. Zipper. 2005. The Forestry Reclamation Approach. U.S. Office of Surface Mining. Forest Reclamation Advisory Number 2. 4 p. (available from <http://arri.osmre.gov/>).

c. Vories, K., C. and D. Throgmorton. 1999. (eds.). A Technical Interactive Forum on Enhancement of Reforestation on Coal Mine Land. USDOJ Office of Surface Mining and Coal Research Center, Southern Illinois University at Carbondale. 248p. (available from <http://www.mcrcc.osmre.gov/PDF/Forums/Reforestation/contents.pdf>).

d. Vories, K., C. and D. Throgmorton. 2002. (eds.). Proceedings of the Market-Based Approaches to Mined Land Reclamation and Reforestation: A Technical Interactive Forum. May 15-16, 2002. Fort Mitchell, Kentucky. USDOJ Office of Surface Mining and Coal Research Center, Southern Illinois University at Carbondale, Illinois. 153 p. (available from <http://www.mcrcc.osmre.gov/PDF/Forums/MarketBasedReforest/TOC.pdf>).

10. **Effective Date.** Upon Issuance
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12. **List of Appendices.** None
13. **Contacts.** Assistant Director, Program Support