Virginia Department of Mines Minerals and Energy

Division of Mined Land Reclamation

MEMORANDUM

3/96

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TO: Coal Operators, Consultants, DMLR Personnel, and Interested Parties

From: Danny R. Brown, Division Director

Subject: Guidelines for Husbandry and Reclamation Practices Appropriate for Forestry Post-mining Land Uses; and Remining Permit Streamline Procedures

Date: July 9, 1996

The Virginia Department of Mines, Minerals, and Energy's Division of Mined Land Reclamation has developed guidance documents concerning: 1) husbandry and reclamation practices relating to the post mining land use of forestry; and 2) streamlined permitting Procedures for remining applications.

DMLR is recommending new husbandry and reclamation practices that will promote timber production on reclaimed lands. Questions concerning forestry related issues should be Directed to Jerry Legg in the Big Stone Gap office at 540-523-8191.

DMLR is implementing the remining permit streamline procedures to ensure that all Remining applications are reviewed expeditiously and in a fair and consistent manner. DMLR will continue to work with our customers to address their respective needs regarding permit reviews, status of applications or other permitting related matters. Recommendations or questions concerning the remining permit streamline procedures should be directed to Norman Enix in the Big Stone Gap Office at 540-523-8286.

RATIONALE

Timber production is an economic objective for some landowners; therefore, reclamation and husbandry practices conducive to productive forestry should be used when forestry is the intended post-mining land use. DMLR is adding additional husbandry practices to the list of approved husbandry practices listed in Memo to Operators 8-94.

Current reclamation practices present three prevalent problems concerning reforestation and timber production: 1) excessively compacted minesoil, 2) inappropriate spoil material, and 3) competition from herbaceous ground covers established to control erosion.

Independent research indicates that burying salty, alkaline spoils below four feet and Reducing compaction and competition from groundcovers has the potential to dramatically increase timber yield on reclaimed lands. Therefore, the final surface of forest land should be topsoil or brown weathered sandstone and should be less intensively graded, especially on level and gentle slopes where erosion hazard is slight. Less aggressive ground covers should be used to facilitate tree seedling survival.

FORESTRY RECLAMATION PRACTICES

These reclamation practices should be followed when implementing forestry post-mining land uses:

1. Spoil Selection—In addition to available topsoil, at least four feet of a good-quality mine spoil should be placed at the surface to accommodate the needs of deeply rooted trees. Mine spoils with low to moderate levels of soluble salts, an equilibrium pH of 4.5 to 6.5, and a sandy loam texture are preferred. Brown, oxidized sandstone found near the surface in most areas of the coalfields weathers quickly into a good soil medium for trees.

2. Grading—Minimizing soil compaction is extremely important. The problem is most prevalent on level areas that could be very productive. Compaction that occurs during the final lift should be minimized by doing the dumping and leveling in separate operations. Trucks delivering the final layer of overburden can place the spoil in tightly spaced piles across the whole area. After the spoil is in place, a bulldozer can knock the tops off the piles and gently level the area with one or two passes. These practices can be utilized in areas where slope ratios are 2:1 or less.

3. Tree-compatible groundcover—Reforestation requires a carefully planned balance between ground cover for erosion control and trees' requirements for light, water, and space. Ground covers should include grasses and legume species that are slow growing, have a sprawling growth form, and are tolerant of acid (pH 4.5 to 6.5), infertile minesoils. Tree compatible ground covers are designed to be relatively sparse during the first year and become increasingly lush by the second and third years. This allows tree seedlings to emerge above the ground and ensures their survival. K-31 tall fescue and all clovers (except ladino) should be avoided. A typical seed mixture for forestry post mining land uses should include:

SPECIES/FERTILIZER	RATE
GRASSES	lbs/acre
foxtail millet (spring seeding only)	5
rye (fall seeding only)	30
red top	2
weeping lovegrass	2
perennial ryegrass	5
orchard grass	15
LEGUMES	
kobe lespedeza	5
birdsfoot trefoil	5
Appalow lespedeza	5
ladino clover	3
FERTILIZER	
10-20-20	300

4. Tree species selection—Two categories of tree species are recommended: 1) crop trees and 2) nitrogen-fixing nurse trees or shrubs. Crop trees are long lived species that offer value to landowners as salable forest products. These include:

Pines:

- pitch x loblolly pine hybrid
- white pine
- Virginia pine

Hardwoods:

- yellow-poplar
- oak species
- white ash
- sycamore
- red maple
- sugar maple
- black cherry

Nurse trees and nurse shrub species recommended for reclamation planting are N-fixing plants that benefit crop trees and provide food and cover for wildlife. Species include:

black locust (should not be used with white pine)
European black alder (should be used with white pine)
bicolor lespedeza
autumn olive
indigo bush
bristly locust

We have attached a list of species available from the Virginia Division of Forestry that may be substituted for some of the above.

HUSBANDRY PRACTICES

The following husbandry practices will be allowed when any forestry application is part of the post mining land use:

1. Split Fertilizer Application—The fertilizers and their rates recommended above should be ideal for both the tree-compatible ground covers and the trees. Compared to fertilizers for hayland/pasture, a lower rate of nitrogen is applied. This reduces the height of the ground cover, but not its density. By the third year, the legumes are supplying a well-regulated, timely supply of nitrogen. However, fertilizer tablets may be added, in addition, to the pine crop trees. The tablets are placed in the "closing" dibble hole when the tree is planted.

2. Ground Cover—Ground cover that is adequate to prevent erosion and promote tree growth, approximately seventy percent, should be used during the first year; however, bond reduction/release cannot be granted with less than 90% ground cover.

3. Species Specific Stem Count for Crop Trees—Pines and hardwoods are usually not compatible; therefore, either pines or hardwoods will be selected. White pines are not recommend for harsh, dry, south– and west-facing slopes. Pitch x loblolly pine hybrids and Virginia pine should do well on most sites. Hardwoods should be planted in mixtures of three or more species, e.g., 100 each of red oak, white oak, yellow poplar, and white ash. All crop trees should be planted on an approximate 10-foot by 10-foot spacing to achieve 400 to 450 planted trees per acre.

4. Nurse Trees/Shrubs—Nurse trees and shrubs will be either planted or hydroseeded with the ground covers. Seedlings are widely available and reasonably priced. They should be interplanted with crop trees on a 15 by 15 spacing to achieve approximately 200 per acre. Density, spacing, and survival are less certain when these species are hydroseeded. Fall hydroseeding is best. Avoid overseeding. Black locust is especially problematic when too much seed is sown; never apply more than 2 ounces per acre. More than 200 stems per acre by age two will have a negative effect on crop trees.

TREES AVAILABLE FROM VIRGINIA DEPARTMENT OF FORESTRY

Alder, European Black
Apple, Common
Ash, Green
Birch, River
Cypress, Bald
Dogwood, Graystem
Dogwood, Red Osier
Lespedeza, VA-70
Locust, Black
Maple, Red
Maple, Sugar
Oak, Northern Red
Oak, Sawtooth
Oak, Southern Red
Oak, Water
Oak, White
Persimmon
Pine, Eastern White 2-0 Improved
Pine, Eastern 3-0 Improved
Pine, Loblolly Improved
Pine, Red
Pine, Scotch Bulgarian
Pine, Shortleaf Improved
Pine, Virginia Improved
Spruce, Norway 3-0
Walnut, Black

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